FACTORS INFLUENCING FOOD PRODUCTION AND HOUSEHOLD FOOD SECURITY AMONG WOMEN FARMERS IN EVURORE, MBEERE DISTRICT, KENYA.

BY

DOROTHY MUTHONI MITUKI
H60/9095/2000

A THESIS PRESENTED TO THE SCHOOL OF PURE AND APPLIED SCIENCES, KENYATTA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN FOODS NUTRITION AND DIETETICS.

KENYATTA UNIVERSITY LIBRARY

SEPTEMBER 2003.
DECLARATION

This thesis is my original work and has not been presented for a degree work in any other University.

Dorothy M. Mituki

The thesis has been submitted for examination with our approval as University supervisors.

Dr. Richard N. O.K’Okul
Senior Lecturer
Department of Foods, Nutrition and Dietetics
Kenyatta University

Dr. C. T. Kithinji
Senior Lecturer
Department of Communication and Technology
Kenyatta University
DEDICATION

This work is dedicated to my loving parents for the great way in which, in the help of God, they brought me up.

Dad you are the source of my inspiration. Your great faith, courage and the ‘never give up’ spirit on matters of life, challenge me.

Mum you are a great woman. You are indeed blessed.
ACKNOWLEDGMENTS

I'm greatly indebted to several people who contributed invaluably towards the successful completion of this work. Firstly, I wish to acknowledge efforts of my supervisors Drs R.N.O. K' Okul and C.T. Kithinji who patiently guided and encouraged me through all the phases of this research work. I also recognise the efforts of other institute's members whose suggestions immensely benefited this work.

Secondly I would like to thank all those who participated in the process of data collection in one-way or the other. The local leaders for their co-operation and assistance, my two field assistants, Eustace Mituki and John Njeru (a social worker with Compassion International). The respondents who voluntarily shared solicited information and all those I interacted with in the data collection process.

Special thanks go to the Principal Njuri Secondary Mrs C.C. Nyaga, for her support in kind throughout the study. My acknowledgements also go to my family members, parents and siblings who encouraged and challenged me into the study.

Lastly, I would like to thank God whose favour and strength I experienced throughout the study.
ABSTRACT

The purpose of the study was to investigate the socio-economic and cultural factors influencing food production among women in Evuvore Division, Mbeere District in Eastern Province, hence the food security status of the respondents. The major objectives of the study were to: investigate the socio-economic, cultural and demographic characteristics influencing food production among women; the food production related factors of the respondents; the household food security status of the respondents and to determine the relationship between selected demographic, socio-economic, cultural characteristics of respondents and household food security.

The study was a descriptive survey design. Data was collected through interview schedules and observation checklist. The sample consisted of 103 households (10% of households from the study area). The sampling was done using the cluster and random sampling techniques.

Data was analysed using the statistical package for social sciences (SPSS) and subjected to descriptive statistics. Frequencies, means and percentages were used to describe, summarise and organise the data. The Pearson Product Moment Correlation was used to obtain the relationship between isolated independent variables and the dependent variable.
The findings revealed low literacy levels among the respondents, 67.96% were primary school dropouts while 26.21% had no formal education. The household sizes were large with a mean of members. The income of the respondents was low (a range of 50 Kshs - 3000 Kshs per month). Respondents were involved in several economic activities involving exploitation of natural resources. Levels of technology employed by the respondents was low, a traditional dagger ‘muro’ was still in use. On household food security, the respondents were found to have a moderate level of food insecurity. They were found to be very vulnerable to food insecurity due to their low income and the erratic rains in the region.

There is need to improve the well being of the producers in order to enhance food production and food security.
TABLE OF CONTENTS
DECLARATION ...................................................................................................................... ii
DEDICATION .................................................................................................................... iii
ACKNOWLEDGMENTS ...................................................................................................... iv
ABSTRACT ......................................................................................................................... v
TABLE OF CONTENTS ..................................................................................................... vi
ABBREVIATIONS ............................................................................................................ vii

CHAPTER ONE .................................................................................................................. 1
Introduction ....................................................................................................................... 1
1.1 Background Information ............................................................................................ 1
1.2 Statement of the Problem ......................................................................................... 3
1.3 Purpose of the Study ............................................................................................... 4
1.4 Specific Objectives .................................................................................................. 4
1.5 Research Questions ................................................................................................. 5
1.6 Assumptions of the Study ...................................................................................... 5
1.7 Significance of the Study ....................................................................................... 5
1.8 Limitation of the Study ......................................................................................... 6
1.9 Definition of Terms ............................................................................................... 6
1.10 The Conceptual Framework ................................................................................ 7

CHAPTER TWO .................................................................................................................. 12
Literature Review ............................................................................................................. 12
2.1 Women and Food Crop Production ........................................................................ 12
2.2 The Concept of Household Food Security ............................................................... 14
2.3 Women and Household Food Security .................................................................. 15
2.4 Women and Land .................................................................................................. 18
2.5 Women and Credit ............................................................................................... 22
2.6 Food production Activities .................................................................................. 24
2.7 Food Security, Nutrition Link .............................................................................. 27
2.8 Food Production and Food Security ..................................................................... 29

CHAPTER THREE ............................................................................................................ 31
Research Methodology ..................................................................................................... 31
3.1 Introduction ............................................................................................................. 31
3.2 Research Design ..................................................................................................... 31
3.3 Study Area ............................................................................................................. 32
3.4 Population .............................................................................................................. 32
3.5 Sampling and Sampling Process ........................................................................... 33
3.6 Data Collection Instruments ................................................................................ 35
3.7 Pre-testing .............................................................................................................. 36
3.8 Data Collection Procedures ................................................................................ 37
3.9 Data Analysis ........................................................................................................ 37
3.10 Measurement of Variables ................................................................................ 38

CHAPTER 4 ....................................................................................................................... 40
Results and Discussion ..................................................................................................... 40
4.1 Introduction ............................................................................................................. 40
4.2 Demographic characteristics of the respondents .................................................... 41
LIST OF TABLES
Table 1: Household Sizes .................................................. 42
Table 2: Spouses Main Occupation ....................................... 47
Table 3: Water Source ......................................................... 50
Table 4: Tillage Labour Division .......................................... 52
Table 5: Breakfast Items ...................................................... 68
Table 6: The Mid-Day Meal .................................................. 68
Table 7: On Evening Meal .................................................... 69
Table 8: Pearson Product Moment Correlation Results .............. 71

LIST OF FIGURES
Figure 1: Schematic Representation of some Farming Systems ........ 9
Figure 2: Sampling Flow Chart .............................................. 35
Figure 3: Age of the respondents .......................................... 41
Figure 4: Respondents level of education ................................ 44
Figure 5: Spouses education level .......................................... 44
Figure 6: Respondents main occupation ................................... 46
Figure 7: Other economic activities of the respondents................. 48
Figure 8: Types of respondents House...................................... 49
Figure 9: Land size............................................................... 58
Figure 10: Farm size............................................................ 59
ABBREVIATIONS

DALEO : Divisional Agricultural and Livestock Extension Officer
FANTA : Food And Nutrition Technical Assistance
FAO : Food and Agriculture Organisation.
GDP : Gross Domestic Product.
IFAD : International Fund for Agricultural Development.
NGO : Non-Governmental Organisation.
SAPs : Structural Adjustment Programmes
SPSS : Statistical Package for Social Sciences
UNICEF : United Nations Children Fund
WB : World Bank
CHAPTER ONE

Introduction

1.1 Background Information

Food production is a priority in many countries of the world. This has existed since the ancient times of hunting and food gathering. With improved technology, food production in terms of yields has improved tremendously. Despite these efforts, food insecurity has remained a problem in the developing countries. It is projected that the world's population will increase to 8.3 billion people by the year 2025 (FAO, 1997b). Increase in population means demand for more food production from the available cultivatable land. The world is capable of providing enough food to supply an adequate diet for all with greater efforts (FAO, 1997b).

Agriculture in the Sub-Saharan Africa has been undergoing a severe crisis evidenced by the decline in food availability (Musalia, 1999), which has been occasioned by decline in food production. Consequently, many African countries rely heavily on Food Aid to alleviate food shortage. Scholars and policy makers argue that there are deep-seated socio-economic factors that underlie much of the food production crisis in Africa (Musalia, 1999; GoK, 2001a).

Kenya's agricultural sector has not realised its full potential. It has been characterised by fluctuations. The country recorded a decline in the sector in the years 1993, 1997, 1998 and 1999 (GoK, 1997, 2001a). Factors seen to be
contributing to the decline in food production include drought, increasing population and the destruction of forests. Inadequate production leads to hunger. It is estimated that 800 million people are chronically hungry in the developing countries (Quisumbing, et al., 1996). Out of these, about 20 million are in East Africa alone. More than 35% of Kenyans are undernourished (FAO, 2000). The presence of hunger results in slowing down physical activity in adults. This makes people less productive.

Kenya as a country relies heavily on the agricultural sector as a major source of food security and the backbone of the economy. About eighty percent of Kenya’s population live in the rural areas and depend heavily on agriculture. However, eighty percent of the total Kenyan land is arid and semi-arid, (ASAL). Out of the total population, twenty-five percent live in this region. Climate is the major cause of food insecurity in the ASAL region since the food producers in the region heavily depend on rain fed agriculture (GoK, 1995; 1997; FAO, 1997b).

Female farmers are becoming increasingly responsible for decisions within the household, which in turn affects food production, (Quisumbing, et al., 1996; FAO, 1997b). This being the case orientation of agricultural research towards the improvement of agricultural production, which helps the rural woman, is of extreme importance.
1.2 Statement of the Problem

Kenya relies heavily on agricultural sector as its main source of food security. The relationship between food production and nutrition lies in the fact that a productive, efficient and sustainable agricultural system goes a long way to ensure food security at all the levels (all factors held constant). Food production is therefore, a key factor in ensuring that enough food is available although accessibility is determined by other factors.

In Kenya, sixty-one percent of the rural women engage in farming as their main occupation compared to twenty-four percent of men (GoK, 1995; Saito, 1994). One critical factor therefore, in revitalizing food production is to raise the productivity of female farmers.

Food production in Mbeere District is too low to feed its population hence the population’s food intake falls far below the annual average food requirements per person especially in cereals and vegetables (GoK, 1997). Providing protein foods however, is not a big problem in the region as the climate favours the production of pulses and livestock keeping. This however does not automatically translate to adequate proteins among the population.

Evurore division is characterised by low production due to a harsh climate, and over reliance on rain-fed agriculture. The harsh climate is a characteristic of the
ASAL region. The Division is highly affected by rural urban migration with men leaving their homes to look for employment in towns. As a result, women farmers are left behind to manage food production. In Mbeere the available information only, highlights the harsh climatical conditions as constraining food production. No studies or information is available on the relationship that exists between the farmer’s social, economic and, cultural conditions influencing food production and food security. There was, therefore, need for the current study to investigate on these factors. Since women as indicated above are managers of food production, they were focused on.

1.3 Purpose of the Study

The purpose of the present study was to investigate factors influencing food production among women in Evuvore Division, Mbeere District in Eastern province and hence household food security.

1.4 Specific Objectives:

The study addressed the following specific objectives.

(a) Establish the socio-economic, and cultural factors influencing food production among women in Evurore Division.

(b) Investigate the food production related factors of the respondents.

(c) Investigate the household food security status of the respondents.
(d) Determine the relationship between household food security and selected socio-economic, and cultural characteristics.

1.5 Research Questions

(i) How is food production among women influenced by socio-economic and cultural factors of the respondents?

(ii) Does land ownership, land size, level of technology and cropping system influence food production among women in the area of study?

(iii) What are the main constraints in food production among the respondents?

(iv) Are the respondents food secure?

1.6 Assumptions of the Study

The researcher made one assumption:

That food production is a major contributing factor to household food security in Evurore Division and Mbeere District in general.

1.7 Significance of the Study

The findings are going to be of use in the establishment of Agricultural Intervention Programmes aimed at enhancing food security by the Ministry of Agriculture, NGO’s and policy makers. Extension workers and agricultural officers therefore, in different institutions seeking to establish projects to assist
farmers in the region will find the data useful. It is also expected that the findings will make a contribution to the already existing information on the role of women in food production and food security. In addition, the information obtained shall be useful in establishing intervention programmes by the local leaders that can assist the women farmers under the study in their unique set-up so as to achieve maximum food production.

1.8 Limitation of the Study

The study was limited to a single Location in Mbeere District. It also focused on women farmers only: generalization to other areas of the Division and other farmers should be done with caution. This is because the demographic distribution of the location may not the same in all areas of the Division. The term food production was also limited to activities carried out from tillage of land to the storage of farm produce.

1.9 Definition of Terms

**Household food security:** The ability of a household to produce and buy adequate, safe and good quality food to meet the dietary requirements of all its members at all times when it is not at risk of losing such access.

**Household:** A group of persons who share residential accommodation and/ or responsibilities for production and consumption within the unit.
Food Security: When all people at all times have physical and access to sufficient, safe and nutritious food to meet their needs and food preferences for an active and healthy life.

Subsistence foods: Foods grown, received as gifts or purchased by the household for consumption.

Land tenure: Applies to land holding rights through inheritance, purchase/rental.

Usufruct: Refers to the rights to use land by collective groups or individuals.

Freehold: Refers to the practice of holding exclusive rights to a piece of land by an individual or corporate body, which can be transferred.

1.10 The Conceptual Framework

In order to address the various aspects of this research, the aspects of the “Farming systems approach” theory (FSA) were used. The FSA is modified from Food Agriculture Organisation (1995).

The system seeks to explain the conditions under which farmers operate, which, dictate to the yields. In this case, the individual farmer/farming family is the operator of the farming system. According to FAO, (1995), the farmer’s way in which they earn their living and the social, economic, political and cultural well-being of their households are linked closely and cannot be separated. These conditions are transformed into food production. The current study sought to
investigate the socio-economic and cultural conditions of women farmers in Evurore Location to find out the influence of these factors to food production (political issues were not addressed in the study). The Farming System Approach illustrates the different factors that influence a farmer's output; namely food production resources and other factors like the physical climate.

In the FSA, FAO (1995) views the farming system as comprising three main components, which vary in quality and quantity from one farming family/farmer to another. These account for the difference in farm production. The components include: (diagram on page 9)

**Inputs**: such as land, labour, and capital. They are put into the farming system and are transformed by different throughput processes into outputs.

**Throughput**: this involves all the processes that are involved in the allocation of the inputs of a farming system into the different activities in order to produce the output targeted. The throughput processes include managerial skills, decision-making, level of knowledge and skills, all of which are very different for individual farmers/farming family.

**Output**: the outputs are the processed resources produced by a farming system response to the inputs and throughput, such as income and crop yields.
Social, political, Economical & cultural Elements:
- External
  - Community Resources/Structures
  - Norms/Ideological/Beliefs (e.g. Gender Relations)
  - External support (e.g. Credit, Extension Services)
  - Others

Internal Factors:
- Income, Marital Status
- Education level

Physio-biological Factors:
- Soils
- Climate
- Pests & Insects

External Factors:
- Community Resources/Structures
- Norms/Ideological/Beliefs (e.g. Gender Relations)
- External support (e.g. Credit, Extension Services)
- Others

Inputs:
- Land
- Capital
- Labour
- Management

Throughput:
- Education Level
- Agricultural skills

Output:
- Income, Crop yields

Note: Broken lines represent the results of the farming system.
Modified from FAO (1995).
The farming system approach recognises the uniqueness of individual farmer/farming family as far as inputs and throughputs are concerned. It also recognises the influence of factors that are beyond the farmer’s control such as the physical / biological environment and others that the farmer has control of to some extent. These factors include the following:

- The physical and the biological factors that are unique to different geographical regions such as climate, water opportunities, soil types and quality, insects and pests. These factors can be manipulated to some extent by use of technological development. The location under study lies in a very harsh physical environment that is one cause of low food production. The factors have a great influence on the throughput processes.

- Human element. This can also be referred to as exogenous or endogenous factors. Exogenous factors involve the social environment, which are largely out of control by the individual farmer/farming family. They include the following:
  
  (I) Community resources, norms and ideological beliefs as well as existing structure.

  These include labour division in relation to gender and gender particular crops due to ideological beliefs.

  (II) External institutions, which, include extension, credit, and input distribution systems on the input side and market on the output side.
(III) Other influences such as population density, location and infrastructure.

The individual farmer/farming family on the other hand controls endogenous factors to some extent. They include land, labour and capital. Individual farmers/farming families have a control of these inputs and other resources such as managerial ability.

In this research, the focus was on the relationship that individual farmer’s access to inputs and throughputs has on the outputs. Input variables in this study were land, labour and capital. Education level, technological level, agricultural skills and knowledge, and extension services represented the throughput variables while the outputs were represented by food availability. Problems arising to the individual farming family’s farming system and causing household food insecurity were identified and the possible solutions were suggested.
CHAPTER TWO

Literature Review

2.1 Women and Food Crop Production

The sustainable production of food is the first pillar of food security. Women account for seventy to eighty percent of household food production in Sub-Saharan Africa, sixty percent in Asia, and forty-five percent in Latin America and the Caribbean (Quisumbing, et al., 1996).

In Kenya alone, women provide eighty percent of farm labour, yet they find it more difficult than men to acquire inputs, credit, extension, farmers training and information (GoK, 1995). These are very basic factors to food production. Their sufficiency influence food production outputs. It follows that given equal access to these resources; women can achieve yields equal to or even, significantly higher than those of men (Quisumbing, et al., 1996). The Kenya government realises the importance of ensuring easy access and availability of support services to women. In 1995, the government’s policy on agriculture was outlined to focus on providing assistance to smallholder farmers who by force of circumstances are mainly female farmers (GoK, 1995). Improving their access to food production resources was isolated as the first step in improving agriculture, which is the mainstay of the country’s economy. This sector contributes twenty-six percent of the Gross Domestic Product (GDP) directly and a further twenty-
seven percent of the GDP through linkages with other related sectors (GoK, 1995).

Mutoro, (1997), points out that women are the majority in small-scale farming. Any improvement in this sector can only take place when institutions incorporate them into their programmes and involve them in decision making. It is very important to involve women farmers in every aspect of planning in the area of food production in an area like Evurore Division where women are main food producers as the men go to towns in search of employment. Mutoro also notes that women have a positive attitude towards agriculture but their access to resources such as land, credit, and extension services limit them. Despite these constraints, the author argues that women still manage to keep on farming and maintaining their households; in this respect she refers to them as “working wonders”. Although Mutoro’s work looks at agriculture as a whole, her findings are pertinent to the current study, which focused on food production.

State policy and political organisations also influence food production. Musalia (1999), on gender relations in food production, points out that men have been pushed out of their rural homes to seek formal employment. The women are left behind and are expected to work and manage the farms and take care of dependants. Despite the important role they play in food production, state policies are biased against them (GoK, 1999). Musalia points out that to have increased food production and have food security in the country, the constraints inhibiting
the actual farmer need to be solved. This work was pertinent to this study although it covered the whole country.

Another important study on household food security is by Mugo (1995). In the study, it is noted that more than sixty percent of households in Kenya do not produce adequate food to take them through the next season. He argues that in the absence of adequate financial base rural households should produce as much as possible if they are to be food secure. This however, has not been possible. The author singles out the inaccessibility of food production resources such as inputs, technological level, land, labour and also poor climate. The current study sought to determine the constraints farmers face in Evurore in food production. To improve food security, adequate resources should be availed to farmers. Mugo’s study did not look at gender relations in food production but the work was pertinent to the current study, which looked at women in particular in food production.

2.2 The Concept of Household Food Security

For a household to be food secure, three underlying elements have to be met: food availability, access and utilization. Food availability means that there is adequate supply of food. Access refers to the adequate means to obtain food through home production, market and other sources. Utilization on the other hand refers to the appropriate biophysical conditions required to adequately utilise food
to meet dietary needs for good health (FANTA, 1999). For a household to be termed food secure, it has to have the capability of producing, purchasing and consuming adequate food to cater for the dietary requirements of all its members. This will depend on an adequate income, assets such as land and other productive resources (FAO, 1997b). The complexity comes in the fact that this ability has to be sustained. A household may produce adequate food in one or two seasons but may be unable to do so in yet another season due to factors beyond the control of the farmer.

2.3 Women and Household Food Security

The household is a unit of production and consumption. The household is responsible for the provision of health and education for its members. Hence this unit in which members feed from a common pot is required to be sufficient in the provision of adequate and nutritious food, which, is paramount to household food security. (FAO, 1990)

Many households in Kenya experience both transitory and chronic food insecurity. The latter affects urban dwellers dependent on the highly unstable markets and agricultural producers exposed to the high incidence of natural disasters while the former affects individuals or groups of people who consume regularly somewhat less than the minimum needed over a long period (FAO, 2000). Food shortages especially in Sub-Saharan Africa is due to unreliable rains,
insects and pests outbreaks and other catastrophes (Ibid, FAO, 2000). Strategies that will ensure stability and sustainability of food supplies at the household level ought to be sought.

Sustainable food production is the first pillar of food security. Given the crucial role women play in food production and household food security any efforts aimed at improving household food security must address the needs of the woman as a producer. Universally, it is women who are the majority of the world’s agricultural producers. Worldwide, women produce more than fifty percent of the food that is grown, (FAO 1998). In many countries, women are responsible for providing most of the food required by their families; this is the case in Mbeere. Sustainable agriculture cannot be pursued therefore without the explicit recognition of the substantial contribution of the rural women. They provide food for their families despite the unfavourable circumstances they are faced with such include poverty, food insecurity and environmental degradation. Yet they are most affected by limited access to land, credit, capital and education (Mutoro 1997). This is in the view of changing gender roles. In the past, men were seen as providers and heads of households, the woman’s work was considered as given and natural. Such included cultivation, fetching water, caretakers and generally food producers. With time this “ideal” household where the man provided and where the inter-house relations balanced has changed tremendously (FAO, 1990).
According to FAO (1990), there are three categories of households:

(a) Households with resident married men
(b) Absentee married men in which resources are managed by male kin
(c) Married women who practise subsistence agriculture and manage household resources in the absence of the migrant spouse
(d) Woman alone who has no permanent connection with a primary adult male.

The fourth category is mainly that of single, widowed/divorced and the never married. The households headed by women are on the increase. Since women have major decisive roles in food production it’s important to maximise on their potential as food producers by checking on factors that constrain them in this role.

Growing evidence shows that income in the hands of women contributes more to household food security and good nutrition than income controlled by men (FANTA, 2001). The main way of having a household that is food secure is, therefore, by empowering the rural woman economically. In order for governments to do successful revitalization of the agricultural sector, which is the backbone of many African countries’ economy, it is expedient that governments are fully aware of the changes in the African family set-ups (FAO, 1990). Development projects in the rural areas should have a sound understanding of the structure of the households and of the form of change such structures are taking. Central to both agricultural development and changes in the household structure is
the role-played by the women. Women are pivotal to food security of their households (Mazonde, 1998, Breth, 1997, Okigbo, 1997). The current study sought to investigate on the main constraints that face women in Evurore Division in accessing food production resources, consequently influencing household food security in the region.

2.4 Women and Land

Land is portrayed as a source of livelihood, epitomising a community’s well being as such it remains central to rural livelihood in Kenya. It is actually the basis for food production (Kigutha, 1995).

Omosa (1998), points out that there is a relationship between land size and the food position of a household, this relationship however, is influenced by various factors. According to Kigutha (1995), the minimum landholding necessary for subsistence varies from country to country. The same piece of land will produce varying income depending on the (i) cropping patterns, (ii) intensity of land use, (iii) rainfall patterns and the technology applied. The subsistence farm holding in Bangladesh is said to be two acres, three in Egypt and twelve in Kenya.

Women in different parts of the world face diverse problems related to land access. These problems are unique to different regions. For example in Latin America, Agrarian reform programmes tend to give title deeds to men. The concentration of land ownership in the region is rather low among women; the
percentage of the landless among the rural population is also comparatively low (IFAD, 1993). In Sub-Saharan Africa, women are generally not limited to user rights. They are only limited in inheriting of land and to selling of the land. These unequal land rights are reflected in the smaller farm sizes of women farmers (Quisumbing et. al., 1995). Although this has been found to be the case, in many other countries women are able to buy land in their own right. Overall, women have less access to land. They are usually economically deprived (IFAD, 1993). Land, whether inherited, purchased or obtained in whichever way is the most basic resource of agricultural production: access to it should therefore be always ensured for maximum production.

The laws governing women rights to land ownership differ widely in the various parts of the world. They include customary, civil and religious laws. In Mbeere, generally speaking women use land freely. As much as the land is available in a household, there are no restrictions to land usage. When a woman is married into a family, she is made responsible of her husband’s piece of land. She is however, not allowed to dispose land or give it away.

In Sub-Saharan Africa, the pattern of land tenure consists of mutative communal (corporate) tenure system co-existing with the emerging private African ownership, the continued private ownership of the white settlers, pasturelands and other common property resources. The prevailing form of land ownership in
Africa has been one form or another of corporate (e.g. lineage ownership) combined with user's rights held by lower level units (e.g. lineage members) (IFAD, 1993).

Historically in the context of a high land-to-population ratio, this system ensured adequate access to land for the mass of the rural population. The stability of this system has been threatened by two sets of pressure: (i) rising population (ii) changing resource uses on one hand and changes in the form of land tenure on the other (IFAD, 1993).

With regard to rising population and resource use in many areas, both arable and grazing land is becoming scarce (relative to the size of unit necessary for household maintenance). For example, the Kenyan population was around six million at independence and it's more than thirty million today (GOK, 2000). The great population increase has resulted to scarcity of arable land. Kenya's smallholders contribute about three-quarters of the rural poor. Of these poorest segments are in the arid and semi-arid lands. Some twenty-seven percent of them has been declared destitute and has been relying on food aid. Most vulnerable groups of rural populations may be classified as smallholder farmers (households with up to three hectares of crop land) and landless (without any crop land) (IFAD, 1993).
In Kenya, the current tenure arrangement originated from the colonial administration structure. The colonial administration assumed farm households to be single production units. Males who were seen as producers and heads of households were granted title deeds. Women were seen as an appendage to men and anything provided for them was provided through the head of the household (Safilios, 1985). Prior to this rule, the clans owned land under patrilineal system. Each woman who married into the clan had a right to her own piece of land, which she worked on to support her 'house'. The Kenyan society is patrilineal, consequently, factors of production are based on the male line (Mutua, 1997). For example, among the Luhya, Luo, and the Kikuyu, land was allocated to male heads of households. They were obliged to provide each wife with sufficient land on which she could grow food crops. Consequently, all women had guaranteed rights to arable land and were in full control of it as far as user rights were concerned. The land however belonged to the male head of the household. The family consisted of husband, wife (wives) and children. These were the basic land-using unit. In certain areas, however, the larger extended family or kinship group functioned as the basic unit. Land was tilled in common by members of the group. The head of the group in this case was in charge of determining the way land was apportioned and utilised (Mutoro, 1997).

Kenya has three forms of land tenure:
(i) Freehold tenure which gives absolute right of ownership for an indefinite period of time not subject to payment of rent and with no restrictions to use and occupation.

(ii) Community tenure; where by land is controlled by the clan/the family or the appointed leaders

(iii) Leasehold tenure; land is owned for a definite term of years subject to the payment of rent or fee and explicit terms and conditions must be observed (GoK, 1995; Shelter Forum, 1999). Under the above land tenures, women are allowed to purchase land on their own rights but are often disadvantaged by their lack of adequate funds. The current study aimed at investigating conditions women face in accessing the various food resources of which land is one.

2.5 Women and Credit

Women lack access to cash assets that are greatly needed as inputs for food production. This is basically due to their role as unpaid family labourers and subsistence producers. This limits their ability to invest in productivity to enhance agricultural inputs. One reason for being unpaid is the fact that a majority of them are not able to obtain paid jobs. This fact curtails women from many things. One is access to credit. Women's access to credit is also constrained by their lack of access to membership in farmers' associations and co-operatives. This coupled with lack of secure title to property often cuts them off from other sources of
credit (such as Bank Loans). They are therefore, limited in the use of agriculture inputs (Cloud, et al., 1995).

In Kenya credit facilities for farmers are extended for agricultural input for both short and long-term periods. Major society giving credit to farmers are the farmer’s co-operative societies which have increased from 2,416 to 3,080, (GoK, 1994). The government passed considerations for credit due to fluctuations in crop production (GoK, 1994). Most of these policies however have not been implemented like the seasonal credit scheme. This has partly been due to the Structural Adjustment Programmes (SAPs) and the deteriorating economic situation in the country.

Most women in rural Kenya have access to informal credit but typically in small amounts, (Mutoro, 1997). This informal credit includes merry-go-round, which is a major way of saving among women in Kenya. Difficulty in obtaining credit from the formal sector, such as banks, may inhibit the use of inputs and constrain production. Indications are that Kenyan farmers could substantially increase their yields through use of improved seed, fertilisers and other inputs. Research done in Murang’a and Meru found that lack of cash kept women from using more fertilisers, seed and other inputs (WB, 1990). This of course reduced the output. Very few women have access to formal credit. Some women however have husbands who provide some credit indirectly.
In a study done in Kakamega, husbands were willing to allow their wives to seek credit if neither land nor family property was pledged as security, which effectively eliminated formal credit for women. Moreover, women could not seek credit without their husband's permission. (WB, 1991). The question of how the single women make ends meet as far as food production is concerned remains unanswered. This study investigated on this by taking into account the marital status of the women farmers and its influence on food production, hence food availability.

2.6 Food production Activities

The farming activities carried out by farmers are more or less similar in all areas although some are specific to different geological zones and system of farming. The manner in which they are carried out and the extent is critical to food production, for example, climatical problems can be overcome, to some extent through improved technology where financial incentives are adequate. Below are farming practices, which greatly influence food production.

2.6.1 Tillage practices

Tillage involves manipulating the soil prior to planting with the aim of creating a suitable seedbed for particular crops. It is a critical factor in determining the success or failure of crop production especially in area with low rainfall, (FAO,
where the need to prepare a proper seedbed, control weeds, retain and restore moisture is paramount.

Tillage is carried out for various reasons. The primary objective is to control weeds enhance soil water storage and retention and reduce erosion while preparing a desirable seedbed, (FAO, 1990; Nicholas, 1772). The intensity of tillage depends on the resources available, consequently it is classified into three, depending on the power used, human, animal and engine powered equipment. Animal tillage whereby ploughs are used is what is common in the study area. This activity is a high energy consuming operation.

Two types of tillage are carried out, primary tillage which is done for cutting and loosening the soil and secondary tillage which is performed after the primary tillage to improve on the seedbed level ness, structure, the soil pulverization, concentration of the moisture and for the destruction of the weeds, (Mckyes, 1985). In the area of study however only the primary tillage is carried out.

2.6.2 Planting

Planting is a process, which involves covering seed with the soil usually in a seedbed or nursery. The most critical factors in planting are timing and spacing, which determines the plant density. Timing is especially important where rains are erratic since the rains are usually inadequate. According to Gibberd, (1995) in
A study done in the arid parts of Eastern province in Kenya a ten day difference between the dates of planting led to a loss of nearly 25% in yields for crops used. According to this study, cereals were more affected than legumes. Many factors may influence late planting such as lack of resources like seed credit or cash, lack of tillage equipments, farmers wanting to combine first weeding with tillage, and labour bottlenecks. (Anyango et al., 1989, Gibberd, 1995). The planting time for various crops is governed by the environmental requirements of the crop. Early planting is however recommended due to the fact that crops are able to make maximum use of rainfall and are able to escape serious pests diseases and able to establish earlier than weeds.

2.6.3 Weed control

Gibberd (1995) define a weed as a plant that in a given situation is more detrimental to agriculture than beneficial. Weeds strongly compete with food crops for water, nutrients and light. According to (Gibberd, 1995) Poor weed control is one of the major causes of low yields of crops for smallholdings. Experimental evidence has shown that crops are severely checked in their early growth stages by even moderate cover of weeds, which reduce yields. This initial damage cannot be offset by any amount of subsequent weed control.

The number of weeding operations varies depending on amount of rainfall, experienced and the crop-growing period. According to Muhammed (1985), one
weeding operation is enough in millet and sorghum growing areas as they have short growing periods. There are different methods of weed control, which include, mechanical, ecological, biological and chemical method according to (Arnon, 1992).

2.6.4 Pests and Insects control.

Pests are classified into two major groups namely field and storage pests, (K.I.E, 2000). Different methods are used to control pests and insects depending on the population of the pests their stage and the economic status of the farmers. With good farming practices however, such as tillage, early planting crop rotation and harvesting at the right times may help reduce pests and insects. The practices however also depend on adequate inputs like labour, and cash or credit.

The above activities are often carried out by different genders. Men are often responsible for land clearing and preparation while women are more involved in weeding, planting and harvesting. The issue of labour division is however cultural, hence women are involved in land preparation in some areas, while both genders take part in seeding and harvesting.

2.7 Food Security- Nutrition Link

Improving nutrition is an issue of supreme importance to many millions of people throughout the world who are suffering from persistent hunger and malnutrition
and to others who are at risk of doing so in future (FAO, 2000). There is a general consensus that complex sets of factors are responsible for hunger and malnutrition in Africa. These include disappointing agricultural performance, increasing foreign debt, increasing food imports, the high rate of population growth, environmental degradation and persistently high rates of malnutrition and infant mortality (Huss-Ashmore, 1989; Olusen & Obasanjo, 1995).

Food production is one of the factors of food security; adequate yields can be translated into adequate food in the household and hence good nutrition. This however is not always the case. Other factors come into play such as intra-household food distribution, which is usually a problem in food shortage, caretaker’s knowledge of health and nutrition and the caretaker’s allocation of time among, food preparation and childcare activities (FAO, 1998; 2000). In many parts of the world, food in the household is not distributed evenly. This is especially so if the amount is inadequate. For members of the family to be nutritionally sound, food should be distributed proportionally. Nutrition education among caretakers is therefore very important. One’s nutrition status depends directly on the actual amounts and types of food eaten as well as on the health status of the individual. The nutrition education of the caretaker should be at a level that can enable her/him to choose wisely the different foodstuffs containing the nutrient required by the body in the right proportions and amounts. If the above factors are held constant, food production is bound to result into good nutrition if adequate food is produced.
2.9 Food Production and Food Security

Food production plays an important role in ensuring availability, a primary role in strengthening access, where household livelihoods are agriculture-based and a complementary role in utilisation of food. (FAO, 1998) The World Food Summit held in Rome-Italy in November 1996 adopted a universal Declaration of Hunger and Malnutrition. One of the strategies identified in the Conference was intensification of food production. Different governments were supposed to outline their objectives and strategies to ensure freedom from hunger of its citizens. A four percent (4%) per annum growth rate was affirmed as the required minimum agricultural growth rate required in the developing countries for domestic consumption or export to meet this goal. The summit called on these countries to give a high priority to agricultural development and to increase their assistance to their sector, undertake socio-economic reforms and develop mechanisms which support increased food produce, (FAO, 1997a).

Food self-sufficiency has been a food policy objective of many African countries including Kenya as evidenced by various policy papers such as GoK (1994). This has meant food self-sufficiency in locally produced staple cereals, availability to meet the market demand and to some extent the possibility of international trade, (FAO, 1997a). This however has been illusive due to the unpromising economic and ecological factors of most of the developing countries, (FAO, 1997a).
Production of adequate food, (other factors held constant), results in enough food for the populations.

Food production is a determinant of food access. Access refers to adequate means to obtain food via home production, the market or other sources. Household food production and income therefore improve on food access. It is well documented that income generation increases food consumption and also improves the quality of diets especially for poorer households (FAO, 1998; FAO, 2000). As income rises, poorer households spend more on food in the market, as they are able to access food in the market. Kenya relies heavily on agricultural sector (which entails food production) as the base for employment creation, more research in food production therefore needs to be done.
CHAPTER THREE

Research Methodology

3.1 Introduction

This chapter focuses on the following: Research design, description of the study area, target population, sample and sampling procedures, data collection instruments, data collection and data analysis procedures.

3.2 Research Design

This is a descriptive survey study, as it sought to establish and describe a prevailing phenomenon. A descriptive study determines and reports the way things are (Gay, 1981). The researcher investigated the social, economic and cultural factors influencing food production and hence household food security. A survey aims at providing accurate information about a phenomenon and allows collection of quantifiable data in a standardised manner from a larger sample (Borg & Gall, 1983; Gay, 1981). This method is used to study social conduct, relationships and behaviours of people of a population. One other advantage of this method is that extensive and elaborate information can be collected within a short time thus, facilitating more accurate data analysis and efficient use of the researchers’ time, money and labour.
3.3 Study Area

The study was undertaken in Mbeere District. The District is in the arid and semi-arid zone of Eastern province. Although it is generally plain, the District has a few hills, such as Kivuru and Kiang’ombe. The soils are sandy, grey/reddish brown (GoK, 1997) and the main source of income for the population is Agriculture and Livestock production. The climatic conditions are however unfavourable and surplus in food crop production are rare with shortage most of the time due to drought. The District has three administrative Divisions, namely, Gachoka, Siakago and Evurore.

The Division has an area of 410 sq. km and a population of 36,841 people (16,784 men and 20,077 females). The Division lies in the ASAL regions (GoK, 2001b). The rainfall pattern is bimodal. The long rains fall between March and April while the short rains are experienced from October through December. Crops grown include bulrush millet, sorghum, maize, cowpeas, green grams and pigeon peas. The Division has four Locations: Ishiara, Kanyuambora, Kiang’ombe, and Ndurumori.

3.4 Population

The target population in the study were women farmers in Evurore Division, Mbeere District. The accessible population was households of the women farmers. The households of the above were focused on, as they were able to reflect the situation of food production and food security in the region. Women
farmers were selected bearing in mind the high rate of rural urban migration in the area by men.

3.5 Sampling and Sampling Process

Evurore Division is a low-populated area with a total of 7,677 households. Evurore Division was purposively selected for the purpose of the study for three main reasons:

(i) It is in this Division that the Ishiara open market, which serves the entire District and which is able to give important indicators of food security is situated.

(ii) While as Siakago division is covered by the on-going International Fund for Agricultural Development project on the enhancement of household food security, Gachoka Division has a cooler climate and soils that allow the production of crops like beans extensively. Varied activities have been established under the above programme to assist the locals in enhancing household food security. Evurore has a harsh climate, which is a characteristic of the ASAL region. Only the dry cereals thrive well.

(iii) It’s in this Division that the National Cereals Board constructed for the storage of dry cereals is located.

The upper parts of the Division covering Kanyuombora and Kiang’ombe Locations are cooler allowing the cultivation of tobacco and beans. Ishiara and
Ndurumori are comparatively drier allowing the growing of only the dry cereals. Ishiara Location was selected purposively as it’s in this Location the open market and the cereals board are located.

The sampling process to obtain a representative sample involved cluster sampling, whereby groups as opposed to individuals were randomly selected from the two sub-locations of the location, Evurore and Kamarandi sub-locations. To identify the sampling units, a sampling frame comprising a list of all the villages was prepared. The accessible population was divided into villages, which was sought from the two sub-locations. The numbers in each village was sought, and the number of villages to be used determined. The villages were then picked by use of simple random sampling. A total of 103 respondents representing 10% of the total number of the households in the selected sampling area were included in the study. They included seven villages in Kamarandi and six in Evurore, a ten percent of the households was picked from each sampling area. This was done to ensure that the sample was representative. This percentage is appropriate for a descriptive survey (Gay, 1981). Two villages, Ishiara A and B in Evurore Sub-location were not included in the study because one is under an irrigation scheme while the other is the market centre. The researcher/research assistant went to a particular village within a sub-location, picked a starting point randomly and interviewed respondents drawn from the households in the vicinity. Cluster sampling is convenient when the population is spread out over a wide geographic
area. (Gay, 1981). The clusters were in the form of villages. They were used in order to ensure that respondents were drawn from all the corners of the study area, hence enhancing representativeness.

To enrich the information obtained from the respondents, interviews were conducted with the Divisional Agricultural and Livestock Extension Officer (D.A.L.E.O) and the Manager Ishiara cereals depot.

Fig 2. Sampling flow chart

Evurore Division (purposive sampling)

↓

Ishiara Location (Purposive sampling)

↓

Evurore Sub-location

Kamarandi Sub-location (All sampled)

(14 villages - 2) 6 sampled

(14 villages) 7 sampled

(Random sampling of villages, 13 villages)

Sample size, 103 (10%) of households

3.6 Data Collection Instruments

The researcher used two instruments for this study. An interview schedule consisting of both open and closed-ended questions and an observation checklist.
An interview schedule is a list of questions that the interviewer reads to the respondents and writes down the responses. This method was used because it enabled the researcher to obtain in-depth information with clarity given that a majority of the rural women were semi-illiterate. The interview schedule was divided into four sections, which included a section on demographic information, a section on food production activities, third on land ownership, size and credit facilities and the last on questions on food security. An observation checklist was used to obtain the information that could be observed directly such as the type of house, type of farming, presence of food wastes and any movement of domesticated animals to the market.

3.7 Pre-testing

Ten (10) respondents were selected randomly from two villages one in each of the sub-Locations and were not included in the main study. They were obtained from Kiambiti village in Kamarandi and Kagandari B in Evurore. The researcher then made adjustments before the actual research. Adjustments made included shortening of the questionnaire by merging similar questions and removing unnecessary ones. The researcher also rephrased some of the questions, which were not eliciting the intended answers.
3.8 Data Collection Procedures

The researcher obtained a research permit prior to data collection and introduced research objectives and methodology to the local leaders. Appointments were made prior to the interview by the researcher and confidentiality assured. The interviewer trained two research assistants on the technicalities involving the data collection two days prior to data collection. Data was then collected through administering the items on the interview schedule to the respondents who had to be a female parent with an independent household or farming unit. The researcher with the help of the two research assistants read the items and the categories on the interview schedule to the subjects, helped in interpreting to illiterate respondents and the responses written down. This process took five minutes for the literate respondents and eight for the illiterate respondents. In cases where a respondent was not found in a household, the researcher proceeded to the next household. The observational checklist was used to record each defined phenomenon as was observed in each of the households visited. This was done after or before the interview in cases where the researcher or research assistant had to wait for the respondent to finish up what they were doing.

3.9 Data Analysis

Both qualitative and quantitative data was analysed by descriptive Statistics. For qualitative data, data was collapsed into categories; meanings extracted and coded so that patterns, trends and relationships from the information gathered could be
established to address the objectives. Quantitative data was analysed using the computer statistical package for social sciences (SPSS). Descriptive statistics were used to describe key variables such as, household food security, marital status, socio-economic, and cultural characteristics. The quantitative data was presented using mean, (which is a measure of central tendency) frequency tables, and graphs.

The Pearson Product Moment Correlation was used to show the relationship between selected demographic socio-economic cultural, characteristics and household food security. Qualitative data obtained was used to supplement and help in interpreting the quantitative data.

3.10. Measurement of Variables

**Dependent Variable:**

**Household Food Security:**

The variable was determined by collecting data on the respondents’ ability to produce adequate food, the feeding habits, types of food available in the household sources of food and some indicators of food security.

**Independent Variables:**

The variables included were:

i) Selected demographic, socio-economic and cultural characteristics of the respondents, namely, age education level household size
respondent's income the spouses' income, economic activities and cultural aspects of food production.

ii) Food production related factors, which were obtained by investigating on the land ownership, land sizes, farm sizes agricultural training extension services implements used the cropping system control of pests and insects and the main constraints in food production.
CHAPTER 4

Results and Discussion

4.1 Introduction

The purpose of the study was to investigate the socio-economic and cultural factors influencing food production among women farmers in Evurore Division, Mbeere District and hence the household food security status of the respondents. The study arrived at filling the gap that exists of information on factors that influence food production and the household food security other than a harsh climate in the area of study. To achieve this goal, the following research objectives were addressed. To: establish the socio-economic, and cultural, characteristics influencing food production among women in Evurore Division; investigate the food production related factors of the respondents; investigate the household food security status of the respondents; determine the relationship of the household food security of the respondents and selected demographic, socio-economic, cultural characteristics.

The findings have been presented under the following sub-headings:

1. Demographic and general characteristics of the respondents.
2. Socio-economic and cultural factors influencing food production.
3. Food production related factors.
4. Household food security status of the respondents.
5. Coping mechanisms.
6 Relationship of demographic, socio-economic, cultural factors and household food related factors.

4.2 Demographic characteristics of the respondents.

4.2.1 Age

The respondents interviewed were between 20 and 60 years old. The most represented age bracket was between 30-39 years with 59.51% (51 respondents). The least represented category was of between 50-59 years with 9 (8.74% respondents).

The implication here is that majority of the families had young families.

4.2.2 Household size

In this study persons considered to be members of the household included respondent’s immediate family members, their spouses and children, relatives
such as in-laws, and grand children living with the respondent. Others considered were persons living in the households such as house helps or farm hand.

Table 1: Household Sizes in Numbers

<table>
<thead>
<tr>
<th>H/H Size in No'</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1.94%</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0.97%</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>11.65%</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>13.59%</td>
</tr>
<tr>
<td>5</td>
<td>22</td>
<td>21.36%</td>
</tr>
<tr>
<td>6</td>
<td>22</td>
<td>21.36%</td>
</tr>
<tr>
<td>7</td>
<td>15</td>
<td>14.56%</td>
</tr>
<tr>
<td>8</td>
<td>6</td>
<td>5.83%</td>
</tr>
<tr>
<td>9</td>
<td>2</td>
<td>1.94%</td>
</tr>
<tr>
<td>10</td>
<td>5</td>
<td>4.85%</td>
</tr>
<tr>
<td>11</td>
<td>1</td>
<td>0.97%</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>0.97%</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>103</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The number ranged from 2 to a maximum of 12 persons. Families with 5-8 members represented 62%, those with 1-4, 29% while those with 9-12, 9%. The
average household size number was 6 people. The implication here is of adequate farm labour.

4.3 Socio-economic Factors influencing Food Production

4.3.1 Marital status

Marital status does influence variables related to food production such as land ownership, and in turn dictate to food availability. The marital status of the respondents was determined by asking whether persons were married, single, divorced, separated or widowed. Of all the respondents interviewed 77.67% were married, 11.65% were single, 2.91% divorced, and 7.77% widowed (80, 12, 3, 8, respondents respectively.)

4.3.2 Education Levels

The level of education is known to influence the resource utilization of individuals. Low education is a constraint to agriculture. Research has shown that having 4 years in primary education rather than none is associated with an increase of about 80% in annual farm output (Okelo, 1992). The impact of schooling on farm output however, is greater for women than men because with more schooling men tend to seek for off-the-farm employment while women stay back in their homes (FAO, 2002). Both education level of the respondents and their spouses was investigated. On formal education the respondents had reached different levels, (fig. 4 Page 44).
The primary school represented the greatest number for both the respondents and their spouses. The respondents in this category were 67.96%, while their spouses were 49.51%. A proportion of 26.21% of the respondents and 17.48% of their spouses had no formal education at all. A small proportion of 3.88% of the respondents and 6.8% of their spouses had secondary education. Only 1.94% of the respondents and 3.88% of their spouses had any tertiary education. The findings therefore reveal low literacy levels among the respondents, which agree
with the Mbeere District Development Plan (MDDP) on the literacy levels in the
district (GoK, 1997). The low level of tertiary education was due to the low
economic status of the respondents. Many dropped out of school due to lack of
fees although culturally girls were also married early.

4.3.3 Income

A household income determines food produced in yields by influencing on
amounts of money spent on the inputs required. The constraints to women’s
productivity in food production has been said to be mainly socio-economic (FAO,
2002). The findings of this study revealed that the income of the respondents was
not regular for most of them and also their spouses. This was because most of
them were not in formal employment. Their sources of income were vulnerable to
changes. The minimum income for the respondents was Ksh. 50 per month while
the highest was Ksh. 3000. The spouse’s minimum income was Ksh. 150 per
month while the maximum was greater than Ksh. 10,000. A household’s income
is very critical in food production and in ensuring food availability, together with
other productive assets owned by the household such as land (FAO, 1997c). This
is especially so for those who mainly obtain food through purchase as was found
to be true for the respondents in the study (FANTA, 1999).
4.3.4 Main Occupation

Respondents' main occupation is an important variable, as it tends to influence the amount of income and consequently food production and availability. The main occupation of the respondents and their spouses was gathered by asking the respondent to state what they considered their principal occupation and that of their spouses.

A vast majority of 96.12% considered farming their main occupation, others were 1.94% business and 1.94% casual work. The respondents were found to be the main labour providers in food production. The main occupation of the spouses varied. They were involved in a wider range of occupations as compared to the women as shown in table 2 page 47.
Table 2: Spouses Main Occupations

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>30</td>
<td>37.5%</td>
</tr>
<tr>
<td>Farmer</td>
<td>32</td>
<td>40.0%</td>
</tr>
<tr>
<td>Carpentry</td>
<td>4</td>
<td>5.0%</td>
</tr>
<tr>
<td>Masonry</td>
<td>3</td>
<td>3.75%</td>
</tr>
<tr>
<td>Teacher</td>
<td>4</td>
<td>5.0%</td>
</tr>
<tr>
<td>Watchman</td>
<td>3</td>
<td>3.75%</td>
</tr>
<tr>
<td>Ass. Chief</td>
<td>1</td>
<td>1.25%</td>
</tr>
<tr>
<td>Herding</td>
<td>1</td>
<td>1.25%</td>
</tr>
<tr>
<td>Carving</td>
<td>2</td>
<td>2.5%</td>
</tr>
<tr>
<td>Totals</td>
<td>80</td>
<td>100%</td>
</tr>
</tbody>
</table>

About 40% were in farming, 37.5% in business, 5% in teaching and carpentry, 3.75% watchman, and masonry while 2.5% were in carving and 1.25% in herding and provincial administration each.

4.3.5 Other Economic Activities

Most of the respondents, 66.02% indicated that they were not involved in any other economic activity, as illustrated on figure 7 page 48.
A small proportion of 16.50% were involved in weaving, 11.65% in basketry, 3.88% in sale of charcoal and 1.94% sale of domesticated animals (fig 7 page 48). This meant that they heavily relied on farming as a source of income. The findings were different for the spouses. The latter were involved in a wider variety of other economic activities. These activities were mainly off-farm activities, which included, exploitation of natural resources such as brick making, craftwork, carving, carpentry, beekeeping, sand and stone harvesting, 27.5% were involved in sale of domesticated animals, 26.25% involved in charcoal burning and the smaller proportion of 12.5%, 8.75%, involved in carpentry and beekeeping, 6.25% involved in carving, sand and stone harvesting and brick making each, 3.75% brewing of local beer and 2.5% in business. The business type included running of tea or grocery ‘Kiosks’ where tea mandazi or bread were sold in the former or green groceries in the latter. Other kind of business was that of sale of goats, grains, grass (a roofing material) and wild fruits such as ‘nthithi’ in the
open market. Involvement of the respondents in more than one economic activity was possibly a coping mechanism in an effort to provide for the family. Sale of wild fruits also gives an indication of low socio-economic status. Two illegal activities were also carried out: brewing local beer and charcoal burning. The extent and the nature of the other economic activities, dictate to the household income, which in turn determines the amount of income spend on food production and hence their importance.

4.3.6 Type of House

The type of construction material used on the floor, wall and roof of a house is a good indicator of the socio-economic status of a people (FANTA, 1999).

![Figure 8: Type of respondents house](image)

From the findings a majority of households involved in the research lived in mud houses with iron sheet roofs that is 65.05%, 30.10% lived in brick houses roofed with Iron sheets, while those that lived in stone building were 1.94%. Those that
lived in mud houses with grass roof were 2.91%. None lived in mabati houses. Only the wall and the roofing materials were assessed. These results show low economic status of the respondents, which translates to low food production inputs.

4.3.7 Source of Water for the Respondents

Adequacy of water is very important in food security. Inadequacy, more often than not results in poor sanitation, which causes poor health. Poor health on the other hand results in poor utilization of available food. This in the long run results in reduced labour for food production. In cases where the water source is far, women’s time is wasted in fetching water and time for food preparation and food production is limited (FANTA, 1999). This could mean that food is not prepared adequately.

Table 3: Water Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>River</td>
<td>45</td>
<td>43.69%</td>
</tr>
<tr>
<td>Neighbour</td>
<td>25</td>
<td>24.27%</td>
</tr>
<tr>
<td>Own taps</td>
<td>18</td>
<td>17.48%</td>
</tr>
<tr>
<td>Borehole</td>
<td>9</td>
<td>8.74%</td>
</tr>
<tr>
<td>Community water point</td>
<td>6</td>
<td>5.82%</td>
</tr>
<tr>
<td>Totals</td>
<td>103</td>
<td>100%</td>
</tr>
</tbody>
</table>
According to the findings of the study, a majority of 43.69% respondents obtained their water from rivers, 24.27% obtained it from a neighbour's water source, 17.48% from their own taps, 8.74% from boreholes while 5.83% obtained it from a community water point. Respondents who obtained water from taps however reported unreliability of the flow for even months. The method of water collection also indicates the economic status of a group (FANTA, 1999).

4.4 Cultural Factors influencing Food Production

Farm tasks analysis, decision making on food production and sale, crop for particular gender and restriction on land use were investigated.

4.4.1 Farm Tasks Analysis.

Members of the household provided labour in the farms although in a few households casual labour was engaged. The household members performed different tasks. There seemed to be tasks that were done by women and others predominantly done by men. When extra labour was needed respondents involved a group of friends who were mainly women. This was particularly in weeding, harvesting and threshing, referred to as *irima, iketha* and *ivura* respectively in the native language.
Men predominantly did tillage while a greater percentage of women did all the other activities.

**Table 4: Tillage Labour Division**

<table>
<thead>
<tr>
<th>Tillage</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hired labourers (men)</td>
<td>57</td>
<td>55.34%</td>
</tr>
<tr>
<td>Spouses with friends</td>
<td>33</td>
<td>32.04%</td>
</tr>
<tr>
<td>Spouses &amp; labourers (men)</td>
<td>9</td>
<td>8.74%</td>
</tr>
<tr>
<td>Woman &amp; labourers</td>
<td>4</td>
<td>3.88%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Hired labour, which consisted of mainly men, made 55.34%. This meant that a majority of them did not have ploughs but hired which is a sign of low economic levels. Spouses who were involved in tillage with help from a friend made 32.04% of the respondents, spouses with the help of a labourer 8.74%, while women with the help of a labourer made 3.88%. Men were involved in activities that were labour intensive.

Women predominantly carried out planting. According to the findings, 88.35% respondents reported to be wholly responsible for planting, which included all the crops. The respondents, however, did this with friends. Women and labourers made 5.83%, women and spouse made 2.91% while hired labour also made 2.91%.
Weeding was mainly done by women, making 50.48% of the respondents', women and husband made 19.42%, women and labourer, 20.39% women and children 8.74% and labourer alone 0.97%, mainly did weeding.

Scaring of birds was mainly done by women. Among all the respondents, 74.76% reported to be responsible for the task, women and children made 11.65% women and husband 10.68% while labourer alone made 1.94%. This activity was mainly done for sorghum and millet, which attracted birds from the time of flowering to the time of harvest.

It was observed that women also did the harvesting of various crops (that is 50.49%). The rest included women and husband who made 22.33%, women and women friends, 18.45% women and children, 3.88%, women and labourer 2.91% and labourer alone 1.94%.

Threshing was a women responsibility. The findings revealed that threshing was mainly a communal work, (what was referred to as mavura) hence respondents and their friends who were mainly women made a majority with a percentage of 86.41%, women alone 6.8%, women and children, 2.91% while labourers made a slim 0.97%.
A total of 56.66% of the respondents dusted their food crops with pesticides. 43.33% was done by husbands, while 58.25% involved women. The above analyses agree with (Okelo, 1992) whose findings indicate that while men are more involved in land clearing activities, women are involved in weeding, planting and harvesting. Since labour division is more or less a cultural factor, this may vary from one region to another. The above results reveal the important role culture plays in food production. This is mainly observed in communal work of the various activities.

Many households were not found to use additional inputs; the basic inputs are therefore land and labour. While land is fixed labour is not and therefore may influence food production a great deal. Women were found to be the main labour provider, which was partly contributed to out-migration of male adults. The income earned by the spouses was important for the household food production. These findings differed with those of Mugo, (1995) which pointed out that men’s income often times did not contribute towards their households food production.

4.4.2 Decision Making on Food Production and Sale

The respondents were asked to state who was responsible for making decisions on what to plant. The majority of the respondents, 59.22% decided on what to plant, 33.01% consulted with their spouses, while 7.77% reported their husbands to be the main decision makers in food production. The respondents were the main
decision makers on what to plant partly because a good number of the male parents lived away. The findings agree with GoK (2000). According to a report on gender analysis in Kenya the decisions made at the household level depended on the household head and there are many female-headed households in the rural areas. Consequently decisions on weeding and disposal patterns are decided on by women, which is however, observed more in subsistence farming as opposed to where cash crops are grown. The results further revealed that respondents made major decisions on usage of the stored food unless big amounts such as for sale were involved. This included cooking of the same and giving as gifts. Respondents and their spouses, consulted on food sales, especially if the food to be sold exceeded a debe. Seemingly the respondent’s spouses had an upper hand on sale and in the management of the money. This is where the woman was not the household head. Respondents were the ones mainly involved in selling of food, which made 75% compared with 5% of the spouses who sold food.

4.4.3 Restrictions on Land Use

Respondents were asked to state whether they experienced any restrictions in land usage. A vast majority of 94.17% reported no form of restriction while 5.83% reported some restriction by relatives and spouses. A big percentage however reported restriction in cutting down of trees since some were of economic value.
4.4.4 Gender Specific Crop

There seemed to be no crop for a particular gender. When respondents were asked to state whether there was a crop for a particular gender, 100% said there was none.

4.5 Food Production Related Factors

The food production related factors investigated in this study included land ownership, land size, farm size, agricultural training, extension services, control of pests and insects, implements, cropping system used, the main constraints in food production and the main foods grown.

4.5.1 Land Ownership

Land ownership is a determinant variable of the food produced in yields. Respondents were asked to state whether they owned the land that they cultivated or not. The findings revealed that 72.82% of the respondents owned the land they cultivated while 27.18% did not. Among the 72.82% that owned the land only 4% of them had the land registered in their names, this percentage may account for the households without spouses. As for the rest 64% of the respondent’s land, was registered under their husbands and the remaining 4.82% registered under their fathers. This percentage included the married and the unmarried.
They were also asked how they obtained their land, 65.33% inherited from their parents, and 34.67% through purchase. Among those who did not own the land they cultivated 92.86% farmed their relatives land while 7.14% rented. Land did not seem a big problem for the respondents. They interacted freely and obtaining a place to farm even when one owned land did not seem a problem.

Investigation was also done to find out whether there was an inter-gender difference in land ownership. The results revealed that men had an upper hand in obtaining land since they inherited the same from parents, which was not the case with women in the area of study. The respondents also said that the women had to be provided land by their spouses. An indication of a lower economic status among this gender, 88.35% said there was a difference in land ownership, while 10.68% said there was no difference. This percent may account for the unmarried who had purchased their land. This agrees with (Maxwel & Frankenberger, 1993; Mugo, 1995). In a research conducted in East and Southern Africa, it was found out that in most areas land holdings and ownership is related to cultural land inheritance patterns. Women are provided for land in a family set up by their spouses. They only have a worker claim to the land they farm. The fact that title deeds are given to husbands, reduces women’s economic security and increases their dependence on their husbands, it also inhibits food production (Okelo, 1992).
4.5.2 Land Size

The land owned in size was determined by asking the respondents to state the total amount of land they owned in acres.

From the findings the sizes varied a great deal regardless of the household size or any other related factor. The greatest proportion of 33.01% owned between 3.0-5.9 acres of land, 27.18% had 6.0-9.9 acres, 19.42% had more than 10 acres while a small 2.91% had 0.5-2.9.

4.5.3 Farm Size

This variable sought to find out the size of land holding for the respondents. To determine the variable, respondents were asked to state the number of acres they farmed. The findings indicated the holdings as generally small despite the land sizes they claimed to have.
The highest proportion of farmers farmed land between 3-5 acres thus 33.01% those that farmed 0.5-2.9 acres were 18.45%, 6-9 acres 17.48% while 3.88% farmed more than 10 acres. The size of the land holding is closely linked to food availability, as land is a key factor in agricultural production. Households with smaller pieces of land produce less. The small farm sizes may however, be due to inability to maintain larger pieces due to lack of other key essentials in production like seed and credit not withstanding the constant disappointments by the harsh climate.

4.5.4 Agricultural Training

To determine whether respondents had received any training in agriculture, they were asked to state the form of training and the forum. Only 12.62% (13) of the respondents had received any formal training in agriculture, which was in form of seminars, field demonstrations and school for those who had formal
education. Out of the 13, 9 had obtained the formal training in seminars, 3 in field demonstrations and 1 in school. Informal training had been obtained by 23.3% while 65.05% had no agricultural training. The forum of the informal training included, chief baraza, by 73.91%, church gatherings by 17.39% and friends by 8.7%. The Catholic Church was particularly mentioned as being involved in the training. The findings agree with (Okelo. 1992 and GoK, 2000). According to the above, few women obtain agricultural training, they are even less in Agricultural training institutions.

4.5.6 Extension Services

Only 19.42% (20) of the respondents had interacted with extension officers. Out of these only 30% reported to have interacted with a female extension officer while 70% reported to have interacted with male officers. According to GoK, (2000), participants in the agricultural support services are generally men, who may not be fully aware of specific problems that face women farmers. At the time of the study there were three extension officers in the area, despite the fact that a majority of the respondents had not interacted with any. The three were all men. According to Okelo, (1992), access to extension services by women is limited since the extension officers are mainly men who often prefer talking to men.
4.5.6 Control of Pests and Insects.

Pesticides and insecticides are used as food availability and stability strategy. They are used before and after harvest. Both traditional and modern methods of pests and insect control were reported to be in use at different stages of food production. This included the storage of food, planting and storage of seed. All the respondents reported that they had problems in food storage, a few reported to have had problems with seed storage. At the time of research, the respondents complained of a weevil that had caused havoc on the stored food. They gave the weevil different names. Some called it *osama* while others called it *nissan*, as it was believed to spread at a terrific speed. The main problem in storage was the infestation of weevils and rodents while before harvest was that of locusts. A vast majority of 58.25% of the respondents used pesticides in the storage of foodstuff, 48% used ash in the storage of seed while 12% used black carbon (from old cell batteries) in planting. Multiple answers were allowed. Although the use of pesticides was common not all the farmers used them due to their high costs.

4.5.7 Implements Used

In order to determine the level of technology in use by the respondents for food production, they were asked to state the tools they used. All the respondents reported the use of *pangas*, hoes and *jembes*. Ploughs were used by 93% while 78% used a traditional dagger called ‘*muro*’ in the native language. Multiple answers were allowed. The findings reveal a low level of technology, which is a
sign of low socio-economic state and low literacy levels. Improved technology is believed to increase productivity per unit land (Mugo, 1995). Low mechanization increases the farmer's workload and reduces their time as they work longer in the farms, (Okelo, 1992). Using a more efficient tool would therefore save on time and energy.

4.5.7 Cropping System

All the respondents who participated in the research practised mixed farming. To investigate the above, the researcher observed directly in the compound and the farms. The respondents kept some domesticated animals, which included cows, goats and sheep and also reared chicken. In the farms, the crops were intercropped. The cereals were grown together with the legumes, which was advantageous as this enriched, the farms. The reason for doing this was to maximize on the piece of land.

4.5.8 Main Constraints in Food Production

The main constraints in food production were obtained by asking the respondents to state what they thought were main causes of low food production in their households. According to the findings the following were indicated,
4.5.8.1 Inadequate Rainfall

Inadequate rainfall was a major obstacle, with 100% respondents mentioning it as a major constrain. Associated constrains included change of weather patterns with unreliable meteorological information. Only 11.65% did not advance these reasons as associated constrains. According to the Divisional Agricultural and Livestock Extension Officer’s quarterly report the yields at the time of study were fairy good, which did not compare with the previous seasons report which indicated the food situation to be ‘poor to very poor’, (GoK, 2002b, unpublished). This indicated that seasonality greatly influenced food production in the area of study.

4.5.8.2 Lack of seed.

The study revealed lack of seed to be a minor constrain with 41.75% reporting it as a reason for low food production. It seemed like these respondents, were not able to store adequate food for consumption to an extent that they also fed on the seed. This is an indication of household food insecurity. It also points out on poverty, as the respondents seemed to consume all their farm produce only to be unable to procure the same later, even as seed for planting. The situation was not very bad as the D A L E O reported that some seed for the previous season was still in the store not yet collected by farmers. The Government often intervened with certified seed.
4.5.8.3 Insects and pests.

Pests and insects damage food crops which leads to reduced yields. The study revealed that the above were a big problem in the area. A big percentage of 66.02% reported this to be a major problem. The main pests in the time of study were weevils, (especially the Great Large Grain weevil) which damaged stored grains, and grubs, which damage plant roots. Birds and wild animals also posed a big problem. The birds feed on millet and sorghum from the time of flowering to the time of harvest. Those who cultivated along the riverbanks where monkeys were a problem and those that farmed near bushes due to squirrels experienced the wild animals.

4.5.8.4 Lack of fertilizer

The findings revealed fertilizers and manure to be a major problem. A big majority of 94.17% advanced it as a major constrain with a minor 5.83% saying otherwise. The findings point at poverty. A case whereby the respondent lacked adequate resources to meet the requirements needed in food production.

Since all the respondents practiced mixed farming, it also shows that livestock farming was not very intensified, as the manure was not adequate for food production. Mixed farming has been advanced as one of the ways of achieving increased value of output per hectare.
4.5.8.5 Lack of Credit Facilities

The findings revealed the lack of credit to be a major constrain to food production in the area. This was advanced by 100% of all the respondents. There seemed to be no formal credit for farmers in the study area. Despite the steady growth of co-operative societies in Kenya (GoK, 2000), there was none in the study area. None of the respondents had any membership to any co-operative. As GoK (2002a) agrees, co-operative societies are viable mechanisms for smallholder producers to access inputs and markets. Agricultural co-operatives play an important role in mobilizing domestic savings for agricultural production.

4.5.9 Main Food Crops Grown

Respondents were asked to state the main and other minor food crops that they grew. In addition all the food crops that were observed during the data collection were noted. All the respondents were found to be growing cowpeas, a fast majority of 99% grew Bulrush (pearl) millet while sorghum was grown by 98% of the respondents. Green grams were grown by 89% while maize was grown by a slim 37%. Other food crops cultivated included, sweet potatoes, pumpkins, cassava, pigeon peas and arrowroots. The above were grown by counted households despite the fact that especially cassava, they are drought resistant. The market was however well supplied with all the above foodstuffs. The prices of the dry cereals were ‘drastically’ low as was
expressed by the area D.A.L.E.O since it was just after the August harvest. It was evident that the farmers sold their harvest immediately after harvest at very low prices.

4.6 Household Food Security

In order to investigate the household food security in the area the respondents' ability to produce adequate food, recent feeding habits, types of food available in the household, sources of food and some indicators of food security were investigated.

4.6.1 Ability to Produce Adequate Food.

The greatest percentage of the respondents did not produce food to last them until the next season. Only 10.68% said the food they produced was adequate, while 89.32% reported inadequacy of the food produced. Even what was produced ended in the markets immediately after harvest often occasioning the local leaders to curtail sale of foodstuffs. Only 11.65% reported not selling 88.35% sold food. The time for sale varied, 57.28% of the respondents sold food immediately after harvest, and 15.53% anytime, while 6.8% sold food just before the preceding harvest.

Different reasons for selling food were advanced with a majority of 66.02% respondents saying they sold food as an income source. Sale of foodstuffs seemed
to be a major source of income for many of them, 54.37% sold food for fees, and 47.57% sold food to buy other foods. On ways they used to procure food, a majority bought food thus 85.44%, 44.66% got food through casual labour, 8.74% got food through food for work programmes, 2.91% got food through donations by relatives while 37.86% got food from the government relief. Of significance is the fact that a vast majority of the respondents purchased food despite their low socio-economic status. Purchasing food generally affects the poor since they spend a larger proportion of their total income on food.

4.6.2 Recent Feeding Habits

To investigate the above the respondents were asked to state the number of meals they had served for the three meals in a week. A majority had served all the three meals in a day 68.93% (69). A ratio of 25.24% (26) served two meals in a day, while 4.85% (5) only served one meal in a day. The skipping of meals is a sign of household food insecurity (Maxwell & Frankenberger, 1993).

4.6.3 Types of Food Available in the Household.

The findings revealed that the meal items were limited in variety, which according to (FANTA, 2001) is indirect indication of household food insecurity. Items served for breakfast were mainly gruel, tea without milk, tea with milk, porridge or food remains from the previous night as shown on table 5 page 68.
Table 5: Breakfast Items

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porridge/Gruel</td>
<td>59</td>
<td>57.28%</td>
</tr>
<tr>
<td>Tea with milk</td>
<td>24</td>
<td>23.3%</td>
</tr>
<tr>
<td>Tea without milk</td>
<td>17</td>
<td>16.5%</td>
</tr>
<tr>
<td>Leftovers</td>
<td>23</td>
<td>22.33%</td>
</tr>
<tr>
<td>Skip</td>
<td>07</td>
<td>06.8%</td>
</tr>
</tbody>
</table>

Items for lunch included *githeri*, which consisted of maize and cowpeas and a few times beans.

Table 6: The Mid-Day Meal

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gruel/porridge</td>
<td>27</td>
<td>26.21%</td>
</tr>
<tr>
<td>Ugali / Rice &amp; CP/GG</td>
<td>23</td>
<td>22.33%</td>
</tr>
<tr>
<td>Ugali/rice &amp; GV</td>
<td>06</td>
<td>05.25%</td>
</tr>
<tr>
<td>Githeri</td>
<td>78</td>
<td>75.73%</td>
</tr>
<tr>
<td>Musandi</td>
<td>13</td>
<td>12.62%</td>
</tr>
<tr>
<td>Kimere</td>
<td>09</td>
<td>08.74%</td>
</tr>
<tr>
<td>Kiurugo</td>
<td>05</td>
<td>04.85%</td>
</tr>
<tr>
<td>Skip</td>
<td>29</td>
<td>28.16%</td>
</tr>
</tbody>
</table>

*Multiple answers allowed*
Similar items were often served for the evening meals. *Kimere*, which was made by grinding millet and some water to constitute a thick paste, was also served especially in the evenings. Other items included rice/ugali served with green grams or cowpeas, green vegetables or black tea. *Musandi*, which was cooked by mixing different grains such as sorghum, cowpeas and millet and boiling till, they softened was also served. *Kuirugo*, a mixture of sour milk and either millet or sorghum, flour was also served during the mid-day meals. Most of the above traditional foods are often unpopular and are taken when a household is not able to access more acceptable foods.

**Items for the evening meal were more or less like those for lunch but less varied.**

**Table 7: On Evening Meal**

<table>
<thead>
<tr>
<th>Item</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Githeri</td>
<td>78</td>
<td>75.73%</td>
</tr>
<tr>
<td>Ugali &amp; CP / GG</td>
<td>63</td>
<td>61.16%</td>
</tr>
<tr>
<td>Ugali &amp; GV</td>
<td>04</td>
<td>03.88%</td>
</tr>
<tr>
<td>Porridge/ Gruel</td>
<td>07</td>
<td>06.8%</td>
</tr>
<tr>
<td>Ugali &amp; Meat</td>
<td>15</td>
<td>14.56%</td>
</tr>
<tr>
<td>Skip</td>
<td>09</td>
<td>08.74%</td>
</tr>
</tbody>
</table>

* Multiple answers allowed*
The findings revealed that a greater emphasis was placed on this meal as snacks or the light foods such as *kiurugo*, and *kimere*, were not served, porridge, which is light, was only served in 06.8% households.

4.7. Coping Mechanisms

At the time of data collection, sale of livestock and chicken was observed. The respondents streamed in the 'Tuesday' open-air market with chicken, goats, sheep, and cattle. According to (Mugo, 1995), livestock and other household assets are valued as "food insecurity absorbers" in marginal areas. Animals are sold or slaughtered for food during food shortage periods. This seemed to be the case in the study area. Sale of livestock has also been advanced as a coping mechanism by (Maxwel & Frankenberger, 1993). Some spouses of the respondents were also living away from their family as they had left to look for employment. This according to (Mugo, 1995; Maxwel & Frankenberger 1993; FANTA, 1997) is a coping mechanism for food insecurity. To some extent therefore there was food insecurity although not severe. This is in the light of the above coping mechanisms, and the feeding habits. The respondents can also be said to be very vulnerable to food insecurity given that they have low economic status and that they mainly rely on purchasing of food for their food. The respondents are also vulnerable to shocks caused by crop failures due to the erratic rains, according to
(Simister, 1999), households that are vulnerable to such shocks cannot be said to
be food secure.

4.8 The relationship between household food security and selected
demographic and socio-economic characteristics

Table 8: Pearson Product Moment Correlation Results

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millet available</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sorghum available</td>
<td>.550*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green gram available</td>
<td>.038</td>
<td>.338*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cowpeas available</td>
<td>.075</td>
<td>.032</td>
<td>.094</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize available</td>
<td>-.018</td>
<td>.163</td>
<td>.120</td>
<td>.094</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans available</td>
<td>.076</td>
<td>.314*</td>
<td>.185</td>
<td>.047</td>
<td>.531*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family income</td>
<td>.002</td>
<td>.065</td>
<td>.017</td>
<td>.257*</td>
<td>.254*</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land size</td>
<td>.488*</td>
<td>.337*</td>
<td>.071</td>
<td>.067</td>
<td>.013</td>
<td>.010</td>
<td>.003</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household size</td>
<td>.464*</td>
<td>.367*</td>
<td>.473*</td>
<td>.374*</td>
<td>.074</td>
<td>.004</td>
<td>-</td>
<td>.014</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.073</td>
<td>.038</td>
<td>.045</td>
<td>.039</td>
<td>-.139</td>
<td>-</td>
<td>-</td>
<td>.049</td>
<td>.080</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Significant at < 0.05 confidence level
To find out the relationships between household food security and selected independent variables the Pearson Product Moment Correlation was used as indicated on table 8. The Pearson Product Moment Correlation was considered significant at alpha level $p=0.05$, at 95% confidence level.

The results show that:

**There were strong significant correlations between:**

- Family income and maize and cowpeas available ($r=0.254; p=0.01$, $r=0.257; p=0.01$)
- Land size and millet and sorghum available ($r=0.488; p=0.000$, $r=0.367; p=0.001$ respectively)
- Household size and millet, sorghum green grams and cowpeas available ($r=0.464; p=0.000$, $r=0.367; p=0.001$, $r=0.473; p=0.000$, $r=0.371; p=0.000$) respectively.

The significant relationship between cowpeas, maize and family income may have been due to the fact that these crops required some pesticides for their maturing unlike the rest in the area of study. The two were the staple food for the respondents. Maize was mainly obtained through purchase while cowpeas mainly through own production. A good income is therefore important to ensure food availability in the area of study.
A strong and significant correlation between land size, millet and sorghum available indicates that the two crops, which are drought resistant, performed well. Those with big sambas were able to produce substantial amounts. This could be because the two do not require much resources as far as spraying is concerned although they also require a lot of labour.

The high correlation of the household size, millet, sorghum green grams and cowpeas available is possibly because these crops are draught resistant, they also demand a lot of labour, the assumption here is that household size translated to labour availability.

There were weak insignificant positive correlations between:

• Age and sorghum, green grams and cowpeas available ($r=0.038; p=0.045$, $r=0.112; p=0.269$, $r=-0.139; p=0.192$) respectively. The age of the respondent was therefore, not an important factor in food production.

• Millet, sorghum, green grams available and family income ($r=0.002; p=0.981$, $r=0.65; p=0.518$, $r=0.017; p=0.865$). Ideally, those households with high incomes are able to produce more food as they are in a position to purchase productivity-enhancing inputs. The Findings did not clearly portray this. The weak correlation may have been due to the low incomes of the respondents or other causes of low food production such as erratic rains.
- Household size, and maize, beans available ($r=0.074; \ p=0.457$, $r=0.004; \ p=0.972$). These two crops were mainly obtained via purchase; food in a household should increase with the household number. This linear trend was not portrayed which might have been due to the low economic level of the respondents.

There was a negative correlation between:

- The family income and beans available ($r=-0.060; \ p=0.552$). Beans did not do well in the area of study and were often supplemented with cowpeas. This is because they were expensive to buy.
CHAPTER FIVE

Summary, Conclusion and Recommendations

5.1. Introduction

For a household to be termed food secure, availability of food, access to food, sustainability of access to food and resistance to shocks must be ensured at all times (Simister, 1999). One of the main ways of ensuring the above is through own food production. Farming households have greater control over their own supply of food although they have to supplement the same through purchase and other means especially in low food production. Many factors influence the extent of production and its sustainability.

The purpose of this study was to investigate the socio-economic and cultural factors influencing food production by women farmers in Evurore Division, Mbeere District and hence the household food security status of the respondents.

5.2 Objectives of the Study

To achieve the purpose of the study, the following specific objectives were addressed. To establish the demographic, socio-economic and cultural characteristics influencing food production among women in Evurore Division, investigate the food production related factors of the respondents, investigate the household food security status of the respondents' and determine the relationship of household food security and selected demographic, socio-economic, cultural characteristics.
5.3 Methods and Materials

Evurore Division is a low-populated area with a total of 7,677 households. It was selected purposively. Ishiara Location was also purposively selected. The sampling process to obtain a representative sample involved cluster sampling, whereby groups as opposed to individuals were randomly selected from the two sub-locations of the location, Evurore and Kamarandi sub-locations. The accessible population was divided into clusters comprising villages, which was sought from the two sub-locations by use of random sampling. A total sample of 103 respondents was used. To obtain the data an interview schedule and an observation guide were used. The data was summarized by use of frequencies and presented by use of tables and figures. The Pearson Product Moment Correlation was used test relationships.

5.4 Composition of the Data

The respondents aged between 20-60 years of age. The most represented age category was 30-39 years with 59.51% and the least represented age category 50-59 years with 3.74%. The findings revealed low literacy levels among respondents, with the majority only having attained primary education. A big percentage of 67.96% respondents only had primary education, 26.21% did not have any formal education while only 1.94% had tertiary education. The household size was rather large which was hoped translated to adequate farm
labour. The most represented category was 5-8 with 62% while the average size was 6 members.

5.5 Socio-economic Factors

The income of the respondents was low and irregular with the lowest income of Kshs. 50 and the highest earning Kshs. 3000. The income of the respondents’ spouses was slightly more with the lowest earning Kshs. 150 and the highest earning Kshs. 10000. The main occupation of most of the respondents was farming with 96.12%, as compared to their spouses who only got 34.00% in this occupation. This may be because they had low levels of education. The respondents were also involved in other economic activities, which mainly involved exploitation of natural resources such as weaving of mats and baskets and sale of wild fruits. This was the only way they ensured that they had money that they could manage by themselves. The spouses were involved in a wider variety of off-farm activities which were also mainly on exploitation of the natural resources such as sand/stone harvesting, beekeeping, craftsman, carving but also some illegal activities such as charcoal burning and brewing of local beer. The above activities were mainly low income hence the low economic status of the respondents. The main type of houses was mainly made of mud walls and iron sheet roofs, which made 65.05% and followed by brick houses with iron sheet roof with 30.10%, 2.91% had mud houses with grass roof. The above reflects on
low economic status of the respondents. The main water source was the river with 43.69% while those with tap water were 24.27%.

### 5.6 Cultural Factors

Some farm activities were gender sensitive. Men for example predominantly did tillage; women mainly did the rest of the activities. This may be because tillage was a high-energy consuming activity. On decision-making, 59.22% women made decision on what to plant, 33.01% women consulted with their spouses on what to plant while 7.77% spouses made decisions on what to plant. They however consulted when they were selling large amounts of food. There seemed to be no restriction in land use for 94.17% of the respondents. Although the land was generally registered under the men who had the right to inherit the same, it was considered a family asset. The respondents were free to cultivate. There was no crop grown by a particular gender. On acquisition of land, the respondents said that the main constrains women faced was that of low economic status hence not being able to purchase land and the issue of inheriting land. Women in the area of study were generally not allowed to inherit land. One culture aspect that influenced household food security positively was that of communal work during food production. This was for the purpose of labour, an important aspect in food production.
5.7 Food Production Related Factors

A majority of the respondents owned land making 72.82%. The land was generally registered under the male parent unless the respondent was not married. The main means they acquired land through was inheriting from parents, 65.33% while 34.67% purchased land. The most represented land sizes were 3.0-5.9 acres by 33.01%. Farm sizes were almost similar with the most represented category being that between 3-5 acres with 33.01% also. On extension services, only 19.42% had interacted with extension officers, who were mainly men thus 70%.

The findings revealed a relatively rudimentary level of technology. A very traditional tool "muro" which is a form of a dagger was still in use among the majority of the respondents. Others included the hoe and the jembe. The only mechanized tool was the ox- driven plough, which was mainly used for tillage.

Low levels of technology are a contributing factor in low food production. The respondents practised mixed farming. The main constrains to food production included the following:

- Low rainfall advanced by 100% of the respondents.
- Insects and pests, advanced by 66.02%
- Lack of fertilizer/ adequate manure advanced by 94.17%
- Lack of credit facilities advanced by 100%

The rest were minor like lack of seed and wild animals.
5.8 Household Food Security

The majority of the respondents were not able to produce adequate food, thus 89.32%. This agrees with Mugo (1995), who found out that 60% of households in Kenya are not able to produce adequate food to last them until the next season. Only 10.68% produced adequate food. They sold food many times immediately after harvest just to buy it later. The respondents often skipped meals, which indicated inadequacy. The food items were also limited in variety. The respondents often sold domesticated animals and many male parents had out-migrated in search of jobs, which is a sign of household food insecurity. A household's purchasing power, which is related to the income, influences household food security. This is especially for households that rely on the markets for food supply as was found to be the case with the respondents. Given the low economic status of the respondents, they are vulnerable to food insecurity.

5.9 Relationships between selected variables and household food security

related factors

The Pearson Product Moment Correlation was run for land size and food available. There was a strong and significant correlation between land size, millet and sorghum available. This meant that the two crops, which are drought resistant, performed well. Those with big sambas were able to produce substantial amounts.
The relationship between the income of the family and food availability, was weak and insignificant for millet, sorghum, green grams and weak significant for maize, beans and cowpeas. The latter made the staple food for the respondents, hence the relationship. The three latter crops did not do well especially maize and beans and therefore were mainly purchased. The ability to procure the same through purchase was therefore important.

5.10 Conclusions
From the results of the study the following conclusions were made:

1) The most represented age category was that of between 30-39 years with 59.51%. The respondent’s age varied from 20-60 years. The implication here is that most of the households had young families. The children who were therefore not very involved in food production apart from weekends and holiday time.

2) The educational levels of most of the respondents are generally low. Majority, 67.96% had only obtained primary school level of formal education while 26.21% had no formal education. These low literacy levels are translated into low food production. Research has shown that a higher education level is associated with an increase in farm input.
3) The land holdings in the study area were relatively small. According to Kigutha, (1995), the minimum landholding necessary for subsistence farming in Kenya is 12 acres. The most represented category was that between 3.0-5.9 acres with 33.01%. The respondents mainly obtained their land through inheritance, thus 65.33% followed by purchase, 34.67%.

4) The household sizes were generally big with an average of 6 members. This however may not be translated into farm labour as could be assumed as most of the households had young families, hence school going children.

5) The income for the respondents was low with a minimum of Ksh. 50 per month while the maximum had Ksh. 3 000. The low income translated into limited resources for food production. From the findings for example most respondents hired ploughs. There was also a positive strong significant relationship between the income of the spouses and amount of money spent in tillage, planting and weeding. Since the respondents did not produce adequate food to last until the next season, there is danger of food insecurity, due to the low income, given that they mainly depended on purchasing of food.
6) Women were main food producers. Other than tillage women mainly did all the other activities. They also made decisions on food production. However, spouses made a significant contribution through their income in obtaining labour for tillage, planting and weeding. The correlation coefficient index for the amount of money spent on these activities and the spouses income was positive, strong and significant at 0.05 confidence level.

7) The households were found to have a moderate level of food security; this is because the data was collected immediately after the August harvest. Despite this a few households still missed meals. The food items were not varied. They were found to be vulnerable to food insecurity.

8) Many factors such as socio-economic and cultural characteristics of farmers influenced on food production. However, there are factors that are more critical to successful farming, the main one being adequate rainfall. The findings of this study reveal that good climatical conditions are very important in food production.
5.11 RECOMMENDATIONS

From the above findings the following are recommended

1) The local leaders should encourage women farmers in the area to organize themselves so as to start a women farmers union through which credit can be availed to them.

2) The NGOs in the area should initiate community-based projects, which focus on the tertiary industry that the local women are involved in. They should promote for example craftwork such as weaving and pottery. Good market for these products should be sought with the aim of improving the socio-economic status of the people. It will also hopefully reduce sale of foodstuff. The NGOs should also avail micro finance facilities to the women instead of giving food or cash to the individuals.

3) The Agricultural extension and home economics officers should intensify their work and broaden it to all the areas under their operation. They should offer situation specific advice to farmers on food production and food storage practices bearing in mind the socio-economic and socio-cultural characteristics of the people in this area. On the same they should help the farmers establish bee farming (which does not rely on rains) and intensify on roots and tuber food production to build on the food security base of the residents.
4) The women should with the help of agricultural home economics officers establish kitchen gardens, which will go hand in hand with the enhancement of food security with especially green vegetables in mind. Their diet was found to lack in vegetables and fruits.

5) Agricultural research institutes should research on the local fruits with the aim of improving them with varieties that can grow faster hence widely spread, as these are important sources of vitamins in the area.

5.12 SUGGESTIONS FOR FURTHER RESEARCH

From the above findings, it is recommended that:

1) A study is carried out on the nutritional status of the children to ascertain the extent of food inadequacy in the area.

2) A comparative study should be done on food availability between the areas with irrigation and those without.

3) A study should be done on horticulture farming in the district and its influence on food security.
REFERENCES


1. Interview Schedule

Instructions

The interviewer will read out the following questions to the respondent, some items will be explained and probing will be done to get suitable response from the respondent.

SECTION ONE: Demographic Details

RESPONDENTS' NAME-.................................... AGE- .................................. VILLAGE ..................................

HOUSEHOLD NO ............................ DATE .................. Sex (1)F (2)M

1. Marital status---- ----------------

2. Household structure (Record names of all household members currently at home)
<table>
<thead>
<tr>
<th>Name</th>
<th>Relationship to household head</th>
<th>Age</th>
<th>Sex</th>
<th>Main occupation</th>
<th>Education</th>
<th>Income</th>
<th>Other economic activity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION TWO: FOOD PRODUCTION ACTIVITIES

4. What are the food crops grown by your household?

(i) 

(j) 

(k) 

(l) 

(e) 

5. How much of each of the above did you harvest last season and under what acreage?
### Foodstuff Amount Estimates of food lost during harvest & storage Land under each in acreage

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Do you own the land you are farming? Yes 1 ( ) No 2 ( )

a) If yes, how much is the total portion of land? ____________________

b) If yes, is it registered in your name? Yes 1 ( ) No 2 ( ) Specify

c) How much is currently under cultivation? ______________________

d) How did you obtain it? Inheritance 1 ( ) Buying 2 ( ) Marriage 3 ( )

Others,4 ( ) Specify ______________________

e) If no above, how did you obtain it for cultivation? Renting 1 ( )

Borrowing 2 ( ) Others,3 ( ) (Specify) ______________________
7. Does the food you harvest last until the next harvest season? 1= Yes( ) 2= No( )

a) If no in above, how do you meet the shortfall?
Food aid 1( ) Food for work 2 ( ) Casual work 3 ( ) Remittances [from relatives] 4 ( ) Others, 5 ( ) specify

8. How do you use the food you harvest? 1= Consumption ( ) 2= Income source ( ) 3= Barter trade ( ) 4= Others, specify.

9. Where do you store your food? 1= Granary ( ) 2= Store ( ) 3= Others, specify.

10. What do you use to enrich your shambas? 1= Fertiliser ( )

2= Manure( ) 3= Both( ) 4= None( ) 5= Other, specify

b) If none above, why?

11. What tools do you use for cultivation?

1= Panga ( ) 2= Hoe and Jembe ( ) 3= Plough ( ) 4= All above ( )

5= Others, specify

12. Who is in charge of the food that is stored? 1= Wife ( ) 2= Husband ( )

3= Self ( )
13. Do you sell household foodstuff?  
1=Yes ( )  2= No ( )

b) If yes above, why do you do so?  
1=Income ( )  2=Fees ( )  3=Food ( )  
4=Others, ( ) specify ________________________________

14. Who does the actual selling?  
1= Husband ( )  2=Self ( )

15. Who authorises the selling?  
1= Husband ( )  2=Self ( )

16. (a) Who manages the money obtained?  
1=Husband ( )  2=Self ( )

(b) Is there a food crop grown by a particular gender?  
1=Yes  2=No

If yes why?  ___________________________________________

17. At what time of the season do you sell your foodstuffs?  
1=After harvest ( )  
2= Just before another harvest ( )  3= Anytime. ( )

18. Do you do anything to prevent food spoilage?  
1=Yes  2=No

If yes above, how do you preserve your food?
19. Have you received any formal training on food crop production? 1= Yes ( )
2= No ( )

b) If yes, state the where. 

20. Have you received any informal training in food production? 1= Yes ( ) 2= No ( )

If yes above, state the forum.

21. Have you interacted with any agricultural extension workers? 1= Yes ( )
2= No ( ), If yes, how many were male________ Female________
22. Who is involved with the following activities in your household and how do you accomplish these activities?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Person(s) responsible</th>
<th>Money spent (If any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tillage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scaring of birds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threshing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvesting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winnowing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dusting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SECTION 111 LAND USE OWNERSHIP & CREDIT

FACILITIES

23. Is there any difference in the way of acquiring land between men and women that you know? 1= Yes ( ) 2= No ( )

24. Do you have any restrictions on land usage? 1= Yes ( ) 2= No ( )
   If yes above, explain

25. Who decides what to plant? 1= Husband ( ) 2= self ( ) 3= Others
   If yes above, explain

26. Do you have any restrictions on clearing and cutting of trees? 1= Yes ( ) 2= No ( )
   If no above, explain

27. Are you a member of any co-operative society? 1= Yes ( ) 2= No ( )
   b) If no, why?

28. And your husband? 1= Yes ( ) 2= No ( )
   b) If no, why?

29. Have you obtained any loan from the society? 1= Yes ( ) 2= No ( )
   b) If no, why?
30. Do you have any bank account? 1=Yes ( ) 2=No ( )

c) Have you obtained a loan from your Bank? 1= Yes ( ) 2=No ( )

d) If no, why? 

e) If yes, what were the requirements?

f) What were the limitations in obtaining a loan?

f) Who secured the loan? you or your husband? 1=Self ( ) 2= Husband ( )

31. Do you require any additional education on food crop production? 1=Yes ( )
No ( )

32 List major problems you face in food production

(I) 

(ii) 

(iii) 

(iv) 

(v)
SECTION IV. Questions as relating to household food security

33. Please indicate the ingredients that you use to prepare your household meals in the past 24 hours and their source.

<table>
<thead>
<tr>
<th>MEAL 1</th>
<th>MEAL TIME</th>
<th>INGREDIENTS</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MEAL 2</th>
<th>MEAL TIME</th>
<th>INGREDIENTS</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MEAL 3</th>
<th>MEAL TIME</th>
<th>INGREDIENTS</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

34. What is the distance of the nearest health facility?

35. Do you pay for services at the health unit?

36. Which are the common diseases in your community?

37. Is any member of your household chronically ill?
II. Observational Checklist

What to observe.

1. Type of house

1= Mud
2= Wooden
3= Mabati
4= Stone
5= Others, specify

2. Type of storage facility

1= Granary
2= Store
3= Others, specify

3. Household water source

1= River
2= Borehole
3= Tap water
4= Community water point
5= Neighbours water source
6= Others, specify

4. Type of farming

1= Intercropping
2= Monocropping
3= Others, specify

5. Kind of farm preparation at time of data collection,

6. Person found doing the activity above,

7. Note the presence if any food wastes in the compound and shamba.

8. Note any movement of domesticated animals and birds to the market.
Plate: I  A girl holding a traditional tool *Muro* used in planting and weeding in the study area

Plate: II  A farmer weeding with *Muro*

Plate: II  *Gitu*, a storage facility used for storage of grains in Evurore