

**THE IMPACT OF HIV/AIDS ON HOUSEHOLD FOOD SECURITY IN
ARUMERU DISTRICT TANZANIA**

BY

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ABSTRACT

The growing burden of HIV/AIDS has impact on household food security. Families suffer food insecurity because the disease strikes the most economically productive members of the society. However, few researches have been undertaken to examine this situation in Arumeru District. This study was therefore conducted in Arumeru District in 2003 to examine the influence of HIV/AIDS on households food security. It specifically focused on the social problems associated with HIV/AIDS in household, food accessibility, effects of HIV/AIDS on agricultural production and strategies that are used by households to cope with food insecurity. The study employed a cross sectional survey involving 104 households of which 52 households were affected by HIV/AIDS and 52 households were not affected by HIV/AIDS. A snowball sampling technique was employed in the selection of the HIV/AIDS affected households. Systematic sampling was used in selecting households that were not affected by HIV/AIDS. Data for the study was collected by using structured questionnaire. Statistical package for Social Scientist (SPSS) was used to analyse data generated by questionnaire. The results showed high incidence of food insecurity in the affected households. Furthermore effects of HIV/AIDS on households also included age dependence, orphanhood, and migration of family members, school unattendance and inheritance of widows. The results further revealed the changes in the sources of income and decrease in the average weekly income in the affected and unaffected household. Decrease in the size of land used for agriculture and changes in the types of food and cash crop produced were also observed. This was due to inadequate cash to purchase agricultural inputs, selling of land and delay in starting agricultural activities, inadequate money to buy agricultural inputs, inadequate time to undertake agricultural

activities and soil infertility. A change in knowledge that was used in agriculture and livestock production obtained from parents was observed in the both types of households. In addition, substitution of food with cheap commodities was observed to be the dominant coping strategy used by majority of the households. The increased incidence of HIV/AIDS in rural areas calls for more emphasis on HIV/AIDS prevention programs. There is also a need for more education to women and youth to practice safe sex. In order to raise the level of food security at the household, rural households should be encouraged to go for non-farming employment.

DECLARATION

I, NASIM CORNELIUS OLE - LOSAI, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work, and has not been submitted for a higher degree in any other University.

Signature.....*N. O. Losai*.....

Date.....*1 Nov 2019*.....

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DEDICATION

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
CARE	Cooperation Assistance Relief Everywhere
CRIICS	Commonwealth Regional Health Community Secretariat
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
HIV	Human Immunodeficiency Virus
HOSPICE	Specialized nursing Treatment for people with terminal illness
ICAD	International Coalition on AIDS and Development
MMC	Muhimbili Medical Centre
MTP 1	Medium Term Plan 1
MTP 2	Medium Term Plan 2
NACP	National AIDS Control Programme
NORAD	Norwegian Agency for Development Co-operation
OXFAM	Oxford Committee for Famine Relief
SAFAIDS	Southern Africa AIDS Information Dissemination Service
SARA	Support for Analysis and Research in Africa
SNAL	Sokoine University of Agriculture Library
SPSS	Statistical Package for Social Sciences
STDs	Sexually Transmitted Diseases
STP	Short Term Plan
TACAIDS	Tanzania Commission for AIDS
TANESA	Tanzania and Netherlands AIDS Support

TAS	Tanzania AIDS Society
TARP II	Tanzania Agricultural Research Phase Two
TDHS	Tanzania Demographic Health Survey
Tshs	Tanzanian shillings
UNAIDS	United Nation Programme on HIV/AIDS
UNICEF	United Nations Children's Fund
URT	United Republic of Tanzania
USAID	United States Development Agency
USD	United States Dollar
WAMATA	Walio katika mapambano ya Ukimwi Tanzania
WB	World Bank
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Acquired Immunodeficiency Syndrome (AIDS) is a name given to the fatal clinical condition that results from long-term infection with Human Immunodeficiency Virus (HIV). HIV progressively damages the body's immune defence system, preventing the body from protecting itself against infections that would otherwise render harmless. AIDS leads to death of lymphocytes responsible for defending the body against invading microbes thus leaving the affected person susceptible to microorganisms with which s/he had previously lived with. The body becomes susceptible to diseases and opportunistic infections. These opportunistic infections may develop into illness, which would not normally occur in healthy people (Massele *et al.*, 1991). These opportunistic infections include tuberculosis, kaposi sarcoma (a tumour primarily affecting the skin), pneumonia, diarrhoea, and severe weight loss. Over time HIV weakens the immune system to the extent that several opportunistic infections occur at the same time. Death is not caused directly by HIV but one or more of these infections (Panos, 1992).

The HIV/AIDS epidemic in the world continues to exert its toll. It is currently estimated that some 42 million people worldwide are infected with the virus of which 75% are in Sub Saharan Africa (TAS/TACAIDS, 2002). Tragically, the prevalence of the disease is still increasing as indicated by United Nations Programme on HIV/AIDS/World Health Organization (UNAIDS/WHO 2000). Since the disease strikes the most economically

productive members of society, HIV/AIDS is a problem of critical importance for agricultural, economic and social development.

India with over four million people infected has the largest population living with the HIV, but regionally the magnitude of the epidemic is greatest in sub-Saharan Africa where more than 24 million people are infected with the virus (FAO, 2001). Still, the global HIV/AIDS epidemic will have wide spread adverse effects on social and economic development for years to come. HIV/AIDS can no longer be considered solely as a health problem, hence sufficient efforts are needed to address its social, economic and institutional consequences.

To date, the HIV/AIDS epidemic is having a major impact on food security, nutrition, agricultural production and rural societies in many countries. According to FAO (2000), all dimensions of food security, availability, stability, access and use of food are affected where the prevalence of HIV/AIDS is high.

In most of the highly affected countries, agriculture provides a living for the large majority of the population. Agriculture, particularly food production, is affected by HIV/AIDS. FAO (2003) has estimated that in the 27 most affected countries in Africa, seven million agricultural workers have died from AIDS since 1985 and 16 million more deaths are likely to occur in the next two decades.

Food security refers to the availability, accessibility of safe balanced and nutritious food through production, distribution, and purchase or exchange at the household level. This implies sufficient food for a normal healthy life for each and every member of the

household (Kean *et al.*, 1999). Households get food through their own production by gathering wild foods, as a gift from the community, by spending income or assets and through migration (Kean *et al.*, 1999). HIV/AIDS can thus have devastating effects on household food security. The specific impact of HIV/AIDS is related to the livelihood system of the affected households and will vary according to their productive activities (agricultural and non-agricultural) and the economic and socio-cultural context in which they live (FAO, 2000).

Tanzania like any other countries in sub Saharan Africa, is facing serious health and socio economic problems of unprecedented nature as a result of HIV/AIDS epidemic (URT, 2001). The first cases of HIV/AIDS in the country were reported in 1983 and concerted efforts to control the epidemic started in 1985 with formation of a short-term plan. Since then, the national response to the epidemic has been diverse and variable both in nature and scope. Although women and men are about equally infected, women appear to be more infected at the younger age than men (URT 2000).

1.2 Problem statement

There is no doubt that the HIV/AIDS pandemic is a serious economic and health hazard in Tanzania. The current trends of the spread of the epidemic will make it a pervasive disease for a long time in the country. It is not difficult to imagine its impact at the end of this decade (Kapinga *et al.*, 1993). HIV/AIDS is not just a problem of the health sector. It affects the society at the national, community, family and personal level (TAS/TACAIDS, 2003). No one can predict the full impact of the HIV/AIDS epidemic on fertility and mortality in any country (Panos, 1992). The morbidity and mortality of the productive

people will have a wide range of negative impact, affecting demographic factors of population growth such as age structure and dependency ratio. Awareness of the need for “downstream” impact responses is needed among those carrying the heavy burden of developing policies, whether they are in national governments, non-governmental organizations (NGOs) or in the affected communities themselves (Barnett *et al.*,1993).

There have been initial efforts to control the spread of HIV/STDs. Among these have been the Short Term Plan (STP) 1985-1986. The first Medium Term Plan (MTP 1) 1987-1991 and the second Medium Term Plan (MTP 2) of 1992-1996.

The widespread loss of active adults affects the entire society’s ability to maintain and reproduce itself. Mechanisms for transferring knowledge, value and beliefs from one generation to the next are disrupted, and social organization is undermined. Agricultural skills may be lost since children are unable to observe their parents working. Due to gender divisions, a surviving parent is not always able to teach the skills and knowledge of the deceased partner (FAO,2001). Within a rural household, there is a marked difference in impact depending on whether the man or woman is affected first by HIV. In general the widespread HIV/AIDS can tear the very fabric of a society.

When the number of affected people in the community increases, the whole community becomes food insecure and impoverished in terms of quantity and quality. For instance, in some highly affected communities, there has been an irreversible collapse of the social asset base (FAO, 2003). It may be difficult to overcome this without assistance. Yet, the epidemic has a significant effect on formal institutions and their ability to carry out policies

and programmes to assist rural households. Institutions may suffer considerable losses in human resources when staff and their families are infected with the HIV. Care for sick family members, attendance at funerals and observation of mourning times reduces the labour output. Skilled staffs are often the first to be affected by the epidemic (FAO, 2001). The disruption in services further aggravates the difficulties in meeting the need of an HIV/AIDS affected population. Apart from those, remote areas tend to be left to fallow and the total output per unit declines, animal and livestock production may decline, post production and food processing are impaired (FAO, 2001).

Since most of the people who are affected are in the economic productive age and majority of the Tanzanians especially in Arumeru District depend on Agriculture as their main source of food it is almost likely that production in the community will decline due to reduced labour force and households suffer food insecurity. Few empirical studies have been conducted to examine the situation or effect in many areas including Arumeru District. This research was done in Arumeru district with the aim of estimating the extent to which HIV/AIDS affects household food security as well as identifying common coping mechanisms of affected and unaffected households in regard to food security.

1.3 Justification

The HIV/AIDS pandemic continues to spread in Arumeru District, yet few studies have been conducted to examine the effect of HIV/AIDS on food security. Arusha region is among the five leading regions with HIV/AIDS in the country and Arumeru district takes the second position among the five districts that are most affected in the region (Tengeru District Hospital, 2001). A research on the impact of HIV/AIDS on household food

security in Arumeru District is important as a basis for designing interventions to reduce HIV/AIDS infection and increase food security. In order to achieve this, this study was proposed towards assessing the effect of HIV/AIDS on agricultural production and the social problems that households face due to the HIV/AIDS scourge. This will be followed by proposed actions to strengthen agriculture, especially with regard to farmer education and training activities as well as to establish coping strategies that households ought use in order to reduce of food insecurity and HIV/AIDS in Arumeru District.

HIV/AIDS induces or deepens poverty. A few surveys that have been conducted on families whose members have AIDS show that households experience a decrease in income and huge rises in medical care spending thus deepening poverty. Decrease in income leads to fewer purchase, diminished savings and dissavings, World Bank (WB, 2002). Decrease in labour force cause most of the rural areas to be underdeveloped since they are the primary sources of production and most of those who are affected are in the income producing age.

At the conclusion of the Millennium Summit in September 2000 world leaders adopted the “United Nations Millennium Declarations” (WB, 2002). Some of the issues mentioned in the summit included;

- A 50% reduction in the proportion of people living in extreme poverty by 2015
- Reduction in poverty and hunger
- A 25% reduction in HIV infection rates among 15-24 years old in the worst affected countries by 2005 and globally by 2015.

Moreover, the Tanzania National AIDS policy has declared HIV/AIDS as a national crisis and is now one of the top priority development agenda of the government along with poverty alleviation (URT, 2001). This work therefore is linked with the millennium goals and the national HIV/AIDS policy and therefore forms rationale of this study.

1.4 General objective

The general objective of this study is to determine the influence of HIV/AIDS on household food security. This information will assist programs and policy makers concerned with HIV/AIDS and food security to design relevant intervention programmes and policies.

1.4.1 Specific objectives

The study has four specific objectives, namely to:

- (a) identify social problems associated with HIV/AIDS.
- (b) determine household accessibility to food
- (c) determine the effect of HIV/AIDS on agricultural production
- (d) identify coping strategies used by households with regard to food security.

1.5 The Conceptual framework

The conceptual framework proposed by this study is presented in Figure 1. The framework shows a set of independent variables which influence food security in the households. In agricultural production, arable fallow land, number of livestock kept, number of bags/gunny produced, labour intensive crops and impaired food storage and processing were the indicators that were measured. The indicators for food accessibility in the

household includes markets and income while labour migration of family members, dependence and inheritance were the indicators which were used to measure social problems in the households. Moreover among the indicators which were used to measure coping strategies used by household included: selling of livestock, selling of labour selling of household assets, selling of land, substitute cheaper commodities, reduction in consumption, sending children to live with relatives. The dependent variable, food security uses the following indicators: number of meals taken per day, number of days with inferior foods and number of days with luxury foods. The variables used in this study are defined in Table 1.

1.6 Hypotheses

The following hypotheses were proposed for this study:

- (a) Inheritance of widow in the affected and unaffected households by HIV/AIDS does not differ significantly.
- (b) Households affected by HIV/AIDS have inadequate food consumption per day
- (c) The amount of maize and beans produced in the affected and unaffected households by HIV/AIDS do not differ significantly.

1.7 Research questions

- a) Is there any difference in agriculture production between the affected and unaffected households?
- b) What is the number of meals taken per day in the affected and unaffected households?
- c) What are the social problems faced by the households due HIV/AIDS?

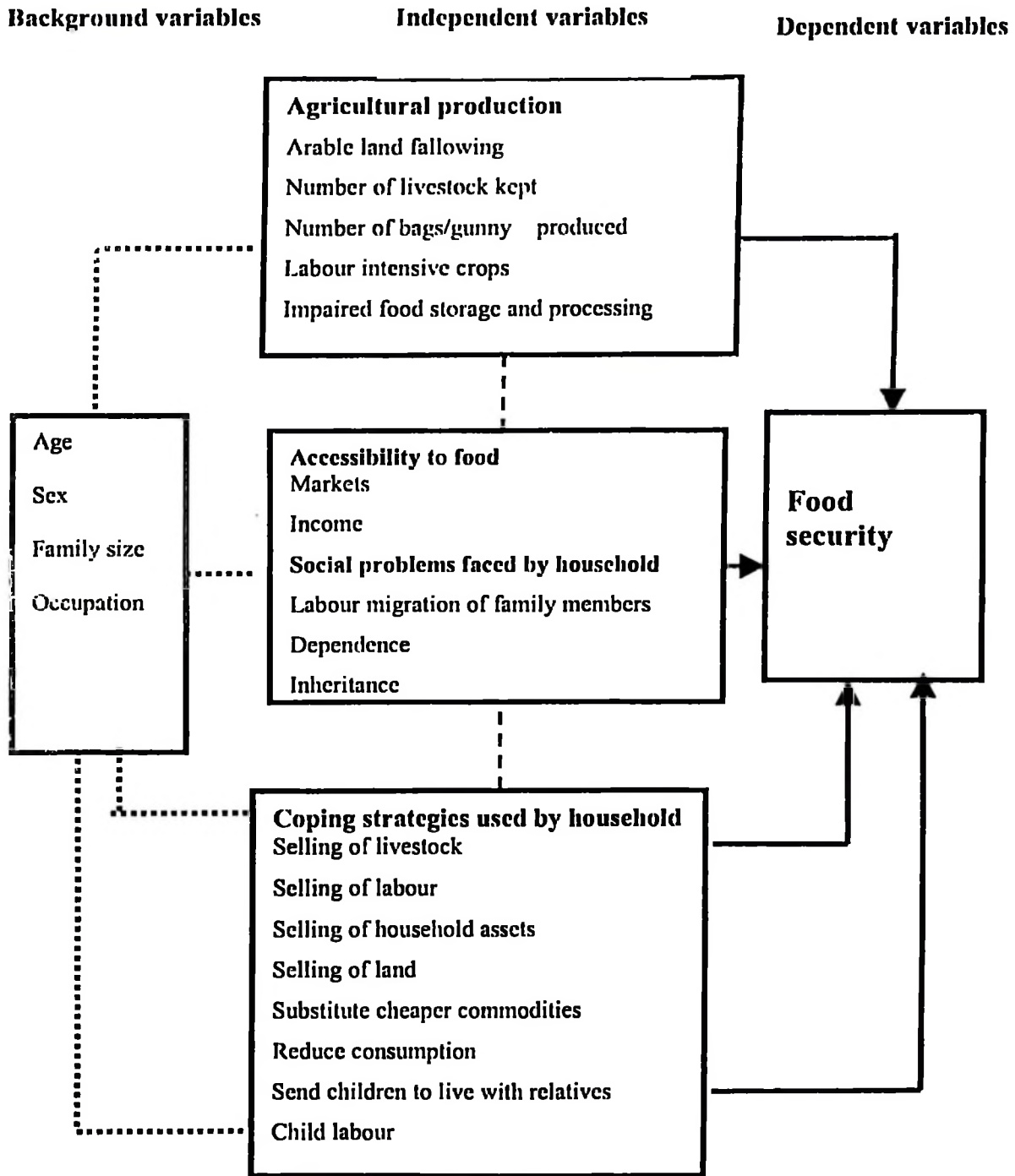


Figure 1: The conceptual framework for the study of the impact of HIV/AIDS on household food security in Arumeru District.

Table: 1 Definition of key variables used in the study

Variable	Indicator
Arable fallow land	Land that is not used for cultivation/farming
Labour intensive crops	Switching from crops which are highly demanding to less demanding ones/crops which require high labour
Impaired food storage and processing	Damage of food due to inadequate resources to purchase storage facilities or inadequate time
Number of livestock kept	Total number of cattles, goats, sheep, rabbit and chicken in the household
Market	Availability of outlets in the study, foods, affordability of food prices
Income	Earning of the household per week in Tsh
Migration	In and out movement of family members
Inheritance	Having a wife /husband whose former husband /wife died of HIV/AIDS or otherwise
Dependence	The ratio of the dependant age group (0 to 14 years old and 65 and above) to the economically active groups (15 to 64) and number of orphans in the household
Food security	Number of meals taken per day Inferior foods: The food that can not provide the recommended daily intake Luxury foods: Foods of high quality

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

In this chapter literature on the impact of HIV/AIDS on household food security is reviewed. First, the concept of household food security and its determinants were discussed in section 2.2. The spread of HIV/AIDS epidemic is reviewed worldwide in section 2.3. Section 2.4 describes the effect of HIV/AIDS in Sub Saharan Africa. Section 2.5 introduces the literature of HIV/AIDS in Tanzania. The national policy on HIV/AIDS is described in section 2.6. The impact of HIV/AIDS on agricultural production, nutrition and socio-economic are described in section 2.7 while the risk factors associated with HIV/AIDS are presented in section 2.8. Food accessibility in the household is described in section 2.9 and section 2.10 reviews the coping strategies used by households with regard to food security. Finally section 2.11 discusses the status of research on HIV/AIDS and food security in Tanzania

2.2 Food Security

2.2.1 The concept of food security

Food security concept has been given different definitions (Rukuni and Eicher 1987). In the past, food security was mostly concerned with food supply, usually in the form of grain stocks and was being applied at regional or district level (Kavishe, 1993). With the passage of time the concept has shifted to questions beyond supply to include access to food at the household and individual levels. (Kean *et al.*, 1999).

Food security is described as a year round access to sufficient food of appropriate nutritional value. This basic human need is dependent on a number of factors such as availability of stability of food stock through either home production or from readily accessible markets, accessibility of food stocks both economically and geographically and equal distribution in households where traditional practices often results in the marginalized members of a family (elderly, children, women) having equal access (ICAD, 2001). FAO (1996) states that food security exist when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security is a set of dynamic, rather than static factors (Milich, 1997).

The World Bank defines food security as access by all people at all times to enough food for an active and healthy life (FAO, 1996). . Food security is dependent upon three factors and these are availability, stability and accessibility of food supplies (FAO, 1996). The importance of this large concept of food security is to ensure that all people at all time have both physical and economic access to the basic food they need (WB, 1985). On the other hand food insecurity is the lack of access to enough food (Maxwell, 1990).

The World Bank perspective on time frame defines food insecurity as either transitory or chronic, where transitory food insecurity is a temporary decline in a household's access to enough food resulting from instability in food production and or household incomes, lack of household ability either to buy or produce enough food (FAO/WHO, 1992). Chronic food security is the persistent lack of a household's access to enough food resulting from instability in food and prices or a household income.

Household food security prevails if the actual food intake of all household members to fulfil their dietary requirements is secured in terms of both quantity and quality throughout the year (FAO, 1990). Access to food can be seen as the process through which food reaches people at both the district and national level. It must also encompass the household or the individual (Clay, 1981). Therefore, a household is said to be food insecure when it fails to meet its dietary food intake in terms of quantity and quality. Evidence suggests that household food insecurity is widespread and chronic in some areas, since there seems to be evident in the periods in the year especially time prior to harvesting (Mosha *et al.*, 1992). In this study food security refers to access as indicated by number of days with inferior and luxury foods at the household level as well as the number of meals taken per day.

2.2.2 Determinants of food security

Most people in Tanzania depend on agriculture for their livelihood (Ishengoma 1998). Tanzania has about 36 million hectares of arable land (almost one hectare per person), out of which only six million hectares are cultivated (Wagao, 1991). In most cases, all rural households grow food crops, accounting for the bulk of the area cultivated. Surveys indicate that under the existing farming system and technologies there exists an abundant cultivable land, which could be productively used. Therefore, land availability in Tanzania does not seem to be a limitation to food production.

In Tanzania, land is owned by the state, and the majority of the communities have the right to own land for agricultural production. However, in some parts of the country, productive land is becoming scarce due to increasing population. This is particularly so in areas where they practice permanent agriculture based on perennial crops like coffee (Ministry

of Agriculture, 1996). However in most parts of the country there is ample land which could be used for expansion of both crop and livestock production.

According to UNICEF/URT (1990), cited by Ishengoma (1998), Tanzania doesn't suffer from food shortages. However, some parts of the country are prone to drought, flooding, marketing, transportations and diseases like HIV/AIDS that hinder food production, subsequently households suffer food insecurity.

The main causes of food insecurity in Tanzania include: HIV/AIDS, pests and diseases, low soil fertility, inadequate farming technologies for crop production, inadequate husbandry practices for livestock production, low yielding crop varieties and animal breeds, high work – load of women and limited access to markets (FAO, 2003). Lack of opportunities for commercialisation result in low incomes and insecure livelihoods (ICAD, 2001). Households need sufficient incomes to purchase the food they are unable to grow for themselves. This study focuses more on the impact of HIV/AIDS on food production.

2.3 The global situation of HIV/AIDS

The World Health Organization (UNAIDS/WHO, 2002) estimates that many people are at risk of infection by HIV/AIDS worldwide. Globally, 42 million people are believed to have acquired HIV infection in 2002 of which 3.2 million are children and 38.6 million are adults. So, there is a need to recognize that risk as a global problem, a human problem, but one which will affect societies differing in their histories, cultural level and ways of life (Barnelt *et al.*, 1992).

The spread of HIV epidemic has varied considerably between developed and developing countries, depending on culture as well as other social and behavioural patterns. Incidence rates have been highest in developing countries where sexual transmission is most common. Indeed, sexual transmission is by far the most important accounting for over 75% of all HIV infections worldwide (Muhondwa, 1997). HIV is a major problem for development and must be taken into consideration by any body working in this field. This is based on the argument that the shape and form of an epidemic reflects the economic, political and cultural characteristics of any society (Barnett *et al.*, 1992).

As the world enters the third decade of the AIDS epidemic, the evidence of its impact is quite apparent and devastating. Wherever the epidemic has spread unchecked, it had robbed countries of the resources and capacities on which human security and development depend. In some regions, HIV/AIDS in combination with other crises, is driving ever-larger parts of the nations towards destitution (UNAIDS/WHO, 2002).

2.4 HIV/AIDS in Sub Saharan Africa

Africa is the global epicentre of AIDS (Preble and Piwoz, 2000). An estimated 83 per cent of all of the world's AIDS deaths, since the start of the epidemic occurred in Africa. By the end of 1998 at least 34 million people living in Sub Saharan Africa had become infected with HIV and some 11.5 million of these have already died. In 1998 alone, about two million Africans died from HIV/AIDS (UNAIDS, 1999).

Countries in the southern and eastern parts of Africa are particularly affected. In Botswana, Namibia, Swaziland, and Zimbabwe, for example, between 20% and 26% of

adults aged 15 – 49 are HIV- infected. In other countries, such as the Central African Republic, Cote d'Ivoire, Kenya, Tanzania, and Uganda, at least 10% of adults are HIV – affected (Preble and Piwoz, 2000). Overall, about 65% of all new adult HIV infections occur in young men and women of less than 30 years old (UNAIDS, 1999). Van de Perre (1999), cited by Preble and Piwoz, (2000) estimates the magnitude of the impact of HIV/AIDS in Africa and has revealed that there are three times more children living with HIV in the city of Bobo-Dioulasso in Burkina Faso.

Women in Africa, especially young ones are disproportionately affected by HIV/AIDS (Preble and Piwoz, 2000). Data suggest that about 55% of all new infections in Africa occur among women and at the end of 1999 the number of infected women has surpassed the number of infected men by more than two million (Preble and Piwoz, 2000). Recent studies show that women of between 15-19 years of age are five to six times more likely to be HIV-infected than men in the same age group (Preble and Piwoz, 2000).

Further more (Preble and Piwoz, 2000) argue that children are not exempted from the direct and indirect effects of AIDS either. High birth rates and high rates of HIV infection in African women contribute to large numbers of infants infected with HIV and rapidly increasing infant and child mortality due to pediatric AIDS-related deaths. In Harare Zimbabwe, for example, infant mortality is estimated to have increased from 30 to 60 per 1,000 live births between 1990 and 1996 and the child mortality rate rose from 8 to 20 per 1000 live births in the same period (UNAIDS, 1999). Across AIDS affected Africa, the epidemic is reversing the gains made in child survival through measures such as promotion

of breastfeeding, immunization, and use of oral rehydration therapy (Preble and Piwoz, 2000).

Breastfeeding plays a major role in mother-to-child transmission of HIV. Breastfeeding is a tradition in Africa, and breast milk is the main source of nutrition for infants during their first years of life. In addition, breastfeeding provides psychological and child-spacing benefits to infants and mothers, and reduces infant and child morbidity and mortality by protecting children from diarrhoea, pneumonia, and other infections. Unfortunately, between 10 and 20 per cent of HIV-infected mothers will pass the virus to their babies through extended breastfeeding (Preble and Piwoz, 2000).

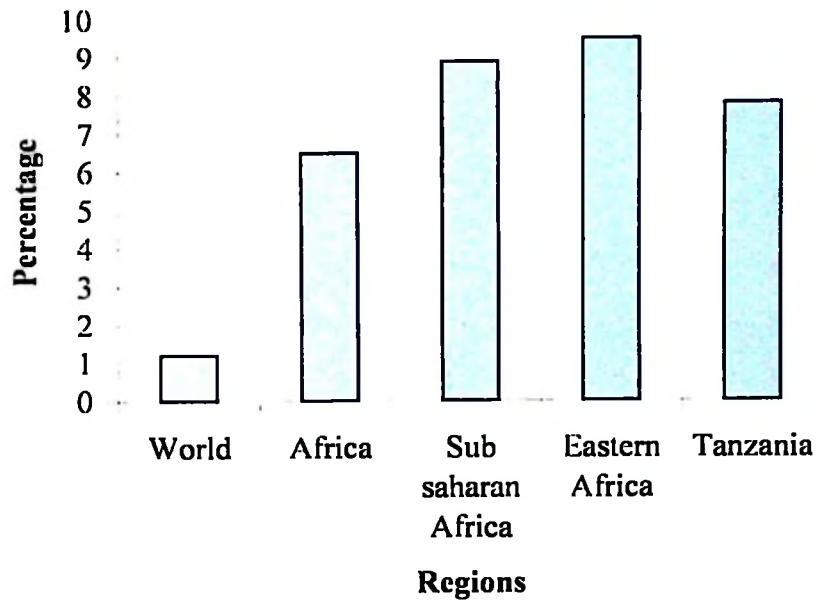
Adult mortality is also severely affected by AIDS in Africa and the epidemic is responsible for declining life expectancy and changing population structures in many countries. In parts of East Africa, for example, where HIV infection rates are around 10 per cent, HIV more than doubles the probability of dying at an early age (UNAIDS, 1999). Life expectancy has already decreased by 20% to 40% in countries such as South Africa, Uganda, Kenya, Zambia, Zimbabwe and Botswana (UNAIDS/WHO, 2002). The epidemic will eventually create a population 'chimney' in these hard-hit countries, with relatively few persons older than 40 years remaining alive to care for the young and the elderly (UNAIDS/WHO, 2002).

The socio-economic impact of the HIV/AIDS epidemic in African countries that are already struggling with conditions of extreme poverty has been disastrous. At the national level, costs of HIV prevention and treatment of AIDS have diverted scarce resources from

other development efforts, including efforts to promote food security, improvement health and education services, and increase in economic productivity. At the family level, illness and death from AIDS have profoundly affected family well-being, including caregivers, ability to ensure adequate food and nutrition for the family. It is estimated that 12 million African children have already lost their mothers or both parents to AIDS before the age 15 and the number of AIDS orphans is expected to grow dramatically in the next 10 years (UNAIDS/WHO, 2002).

2.5 HIV/AIDS in Tanzania

Tanzania, like other countries in Sub-Saharan Africa is facing serious health and socio economic problems of unprecedented nature as a result of the AIDS epidemic as indicated by the National AIDS Control Programme (NACP, 2001). The first cases of AIDS in the country were reported in 1983 in Kagera region. Concerted efforts to control the epidemic started in 1985 with the formation of short-term plans. Since then the national response to the epidemic has been diverse and variable both in nature and scope. Nevertheless, HIV infection rates and deaths due to AIDS in the country continue to grow, suggesting that the epidemic is worsening NACP (1998), cited by Masasi (2000). By 1986 all the regions in Tanzania mainland had reported AIDS cases. By the end of 1999 there were some 600,000 cases of HIV/AIDS and a similar number of orphans. The World Population Bureau (2003) reported that 1.2 per cent of the world population (Fig. 2) in the age group of between 15-49 are HIV/AIDS affected. Out of theme 7.8 percent arc from Tanzania.



Source: World Population Bureau

Figure 2: Population with HIV/AIDS

HIV and AIDS infection has been identified as a serious health and socio-economic problem in Tanzania (TDHS, 1996). Population based surveys from various parts of the country have shown that HIV prevalence rates among adolescents and young adults (15 through 24 years old) range from 1% in rural areas to 21% in certain urban areas (Preble and Piwoz, 2000). HIV/AIDS is a major development crisis that affects all sectors. During the last two decades, HIV/AIDS epidemic has spread relentlessly affecting people in all walks of life and decimating the most productive segments of the population particularly women and men between the ages of 20 and 49 years (URT, 2001).

2.6 The national policy on HIV/AIDS in Tanzania

HIV/AIDS is a global disaster that calls for concerted efforts and unprecedented initiatives at global and national levels. The national HIV/AIDS policy in Tanzania formulated in 2001 provides a framework for individual response to HIV/AIDS pandemic and this works through the Tanzania Commission for AIDS (TACAIDS), which is working under the Prime Minister Office (URT, 2001). The policy is geared to fight against the HIV/AIDS pandemic and everyone has a role to play and must be fully involved in the struggle against HIV/AIDS pandemic. However, the policy will continue to be reviewed and updated in relation to emerging developments life styles (cultural or economic) in society and the trend as well as the impact of the pandemic (URT, 2001).

The overall objective of the National HIV/AIDS policy is to provide for a framework for leadership and coordination of the national multisectoral response to the HIV/AIDS epidemic. It also provides for a framework for strengthening the capacity of institutions, communities and individuals in all sectors to arrest the spread of the epidemic (URT, 2001). The specific objectives includes prevention and transmission of HIV/AIDS, HIV testing, care for people living with HIV/AIDS, sectoral roles and financing, research, legislation and legal issues. However due to the complex social, ethical, legal, cultural and economic aspects of he HIV/AIDS epidemic this policy will be reviewed from time to time in order to address emerging issues (URT, 2001).

2.7 Impact of HIV/AIDS

2.7.1 Agricultural production

Agriculture provides a living for the majority of the population. According to United Nations Food and Agriculture Organization (FAO), seven million agricultural workers have died from AIDS since 1985 in developing countries and 16 million more deaths are likely to take place in the next 20 years if massive and effective programmes are not mounted (USAID, 2003). Households lose not only the income and food production of sick individuals but also the economic contribution of family members who care for them. Additional losses include future income potentials among orphans who cannot afford education and the interruption of the transfer of agricultural skills from one generation to the next (USAID, 2003).

Agriculture, particularly food production, is affected in several ways by HIV/AIDS (FAO, 2001). First there is a fall in agricultural labour force. FAO has estimated that 27 of the most affected countries are in Africa. In the most affected African countries, including Tanzania labour force has decreased ranging from 10% – 26% (FAO, 2001). According to Barnett and Rugalema (2002), cited by Mutangadura *et al.*, (1999) the combination of adult morbidity and mortality and the associated reallocation and withdrawal of labour has led to a number of adverse changes, which have affected households food and livelihood. Studies reveal that a woman with a sick husband in Kagera Region in Tanzania spent 60 per cent less time on agricultural activities than she would normally do (FAO, 1995). Secondly, HIV/AIDS affects food production through sickness and death in a number of ways.

First, remote areas tend to be left to fallow and the total output of agricultural unit declines. Secondly, yield declines as a result of delays or poor timing of essential farming operations. Thirdly lack of resources to purchase agricultural inputs, such as pesticides, fertilizers because during episodes of illness, household financial resources may be diverted to pay for medical treatment (FAO, 2001). It is estimated that approximately two persons are lost per year by the time one person dies of AIDS, due to their weakening and the time others spend giving care (FAO, 2002).

Switching from labour-intensive crops to less demanding ones has been observed as well as reduction in variety of crops grown and change in cropping patterns (FAO, 2001). As a result, food supplies are less varied, with negative impact on nutritional quality of the diet (UNAIDS/WHO, 2002). A study conducted by FAO (1995) in Eastern Africa including Uganda, Tanzania and Zambia reveals that cash crops are abandoned due to inability to maintain enough labour for both cash and subsistence crops. A shift has been identified whereby farmers move away from cultivating labour intensive crops to those that require less labour input, are drought resistant, and are cultivable throughout the year, such as cassava and sweet potatoes. These often contain lower nutritional values. Also, the FAO study indicates that crop production is highly affected by reduction in the size or acreage of land area cultivated, decline in crop yields and decline in the range of crops grown. It has been also is observed that as some of the households become more vulnerable to HIV/AIDS, they are less able to afford risks. As a result, caregivers switch to less economically productive activities such as petty business, which are lower risky and thus lower profit income generating activities. This further contributes to future deterioration of the household ability in its earning potentials (Mwakalobo, 2003).

Animal husbandry and livestock production too may decline. Livestock may be sold to meet the medical costs of AIDS patient and funeral rites which include slaughtering of animals. Post production food storage and processing are impaired. Thus the security of food and other raw materials between harvests are at risk, including the availability of seed for subsequent cropping (FAO, 2003).

Break in services as the staff falls sick also occurs. Management capacity, transport and extension services may be disrupted, aggravating further the plight of rural households (FAO, 2001). Credit for agricultural production may be diverted to meet medical care of sick relatives, funeral and food expenses. This results in the reduction of crop yield and loss of income causing families to default loan repayments or sell assets (UNAIDS/WHO 2002).

Moreover, HIV/AIDS can have a detrimental effect on commercial production. On small farms, cash crops may be abandoned because there is no enough labour for both cash and subsistence crops. This affects food availability at the household, community and national level (FAO, 2001).

Studies have shown that when HIV/AIDS strikes members of the households, patterns of agricultural production change, and output from production decline threatening food security in both the countryside and city. A number of other consequences follow the spread of HIV/AIDS into a household; children may be pulled out of school, elderly people may have to fend for themselves as their own offspring die from virus, savings can be

spent on caring for the sick other assets such as home, land or livestock may be sold off to pay for medical treatment (UNAIDS, 2001).

According to FAO (2001), the loss of able-bodied adults affects the entire society ability to maintain and reproduce itself. Agricultural skills may be lost since children are unable to observe their parents work, and hence agricultural production is affected which results in food insecurity. Since the disease strikes the most economically productive members of the society, HIV/AIDS is a problem of critical importance for agricultural, economic and social developments. Other effects include; loss of seasonal workers and decreased employment opportunities and reduced local economic spin offs. Thus HIV/AIDS can affect healthy people as some economic activities may no be viable. In Tanzania this information is not well known so this study intends to examine some of the above-mentioned factors specifically in Arumeru District.

2.7.2 Food and nutrition

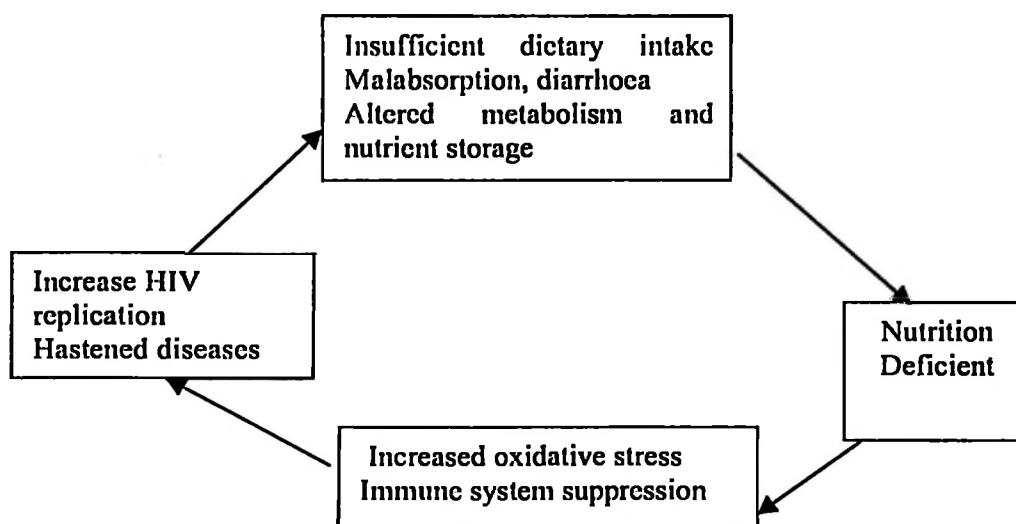
HIV/AIDS has a devastating effect on household's food security and nutrition (FAO, 2003). Nutritional status is determined by various factors often categorized into household food security, health care all of which are affected by HIV/AIDS. The specific impact of HIV/AIDS is related to the livelihood system of the affected household and it varies according to their productive activities (of agriculture and non-agriculture), the economic and socio cultural contexts in which they live. This is because there is a decrease in labour force, worker productivity, and output eventually decline in national food supply (Preble and Piwoz, 2000).

The effect of HIV/AIDS on the labour force has a direct impact on the ability of the household to either produce sufficient food or to work in order to receive wages and have the ability to purchase food. Food insecurity increases vulnerability to HIV/AIDS infection, poor nutrition contributes to poor health, low labour productivity, low income, and livelihood insecurity. These factors can include behaviour conducive to HIV/AIDS infection such as migration for opportunities and engaging in the commercial sex trade to earn additional income (ICAD, 2001).

In the households coping with HIV/AIDS, food consumption generally decreases. The family may lack food and the time and means to prepare some meals, especially when the mother dies. Research in Tanzania show that per capita food consumption decrease by 15% in the poorest households when an adult dies (Kean *et al.*, 1999). A study carried out in Uganda show that food insecurity and malnutrition were foremost among the immediate problems faced by female-headed AIDS affected households. For a patient, malnutrition and HIV can form a vicious cycle whereby under nutrition increases the susceptibility to infections and consequently worsens the severity of HIV disease, which in turn results in a further deterioration status. Because of poor nutrition and food insecurity in the household, there is an increase in the susceptibility of infection to the persons affected with HIV. Lack of food in the household may result in deficiency of the micro and macronutrients needed by the body (Preble and Piwoz, 2000).

The relationship between HIV and nutrition may be more complicated because the virus directly attacks and destroys the immune system (Preble and Piwoz, 2000). Nutrition deficiencies affect immune function in ways that may influence viral expression and

replication further affecting HIV disease progression and mortality (See Fig 3) Oxidative stress for example, may indirectly hasten HIV replication Scmba and Tang (1999), cited by Preble and Piwoz, (2000). HIV also affects the production of hormones such as glucagons insulin, epinephrine and cortisol, which are involved in metabolism of carbohydrates, proteins and fats. Elevated levels of these hormones contribute to weight loss and the wasting syndrome seen in most adults AIDS patients.



Source; Preble and Piwoz 2000.

Figure 3: The Vicious Cycle of Malnutrition and Human Immunodeficiency (HIV) Pathogenesis

2.7.3 Economic impact of HIV/AIDS in Tanzania

The socio-economic impact of the epidemic is devastating and has affected individuals, communities, firms and governments. The overall gains in Gross Domestic Product (GDP) in most countries will slowly be reversed if the prevalence of HIV/AIDS continues to rise, and resources are greatly stretched (CRHCS 2001). The epidemic affects the overall health status of society and leads to increased health-related expenditures at household, firm and

government levels. It also lowers productivity and growth performance of the country, as well as reversing the gains made in human resource development and progress in the social sector (UNAIDS, 2001).

Because of its negative effects on productivity, health expenditure and demographic patterns, as well as business and household outputs and profits, HIV/AIDS has adverse effects on the macro-economic performance of countries. The high prevalence of HIV/AIDS has contributed greatly to an overall low level of savings and investments because more resources are being allocated to health, orphan care and funerals. The disease has also reduced labour productivity as a result of morbidity leading to absenteeism and mortality, culminating in loss of experienced workers. The economic impact of HIV/AIDS is particularly severe because most infections occur among the economically active 15-49 years age group (CRCHCS, 2001). The degree to which commercial agriculture is being adversely affected by HIV/AIDS depends on a wide range of factors including the labour shortage in the community. Labour intensive operations suffer because HIV/AIDS affects the skilled labour category there by reducing production and plummeting benefits. Decline in asset base result in decrease in capacity of survivors and their income levels compared to the pre- AIDS farm production levels.

According to National AIDS Control Programme in Tanzania (1998) all health and death due to AIDS were reported to have reduced agricultural labour force, productivity and disposable incomes in many families and rural communities. Data from Kagera, one of the regions most severely affected by HIV/AIDS, indicated that annual Gross Domestic Product (GDP) declined from USD 268 to USD 91 between 1983 and 1994 (NACP/MMC,

1999). Jackson (2002), argues that because AIDS affects the productive age range in the population, productivity and production in household, communities, sectoral and national economic security declines.

2.7.4 Social Impact of HIV/AIDS

Many social problems are associated with HIV/AIDS. Some of the common problems include deepening poverty, pressure to drop out of school, food insecurity reduced access to health services, deteriorating housing, worsening material conditions, and loss of access to land and other productive assets. Psychosocial distress is also common with children and families; it is brought on by anxiety, loss of parental love and nurture, depression, grief and distribution of siblings among relatives to spread the economic burden of their care in poor households. HIV related illnesses lead directly to household economic problems as adults fall sick and cannot work, available resources are used for treatment, and other family members divert their time to provide care (UNAIDS, 2001). In this case, the focus is on age dependency, orphanage, inheritance, migration and education.

2.7.4.1 Age dependence

Mandara (1998) argues that Tanzanian economically productive group to be ranging from the age 15 to 64 years old. This means that the population aged below and above this age group is dependent. Dependence ratio is therefore, a ratio of population economically productive to that not economically productive. The dependence ratio indicates the economic potential of the households and hence a community. Approximately, half of all household members in Sub Saharan Africa are under fifteen years of age (TDHS, 1997). Furthermore, the age dependence is found to be low in the urban areas compared to the

rural. Rodgers *et al.*, (1989) reported that child dependence is found to be higher in the rural compared to that of urban areas. In Tanzania, age dependency was found to be 41.1% and 48.8% for the urban and rural respectively (TDHS, 1997).

Experience shows out that poor households tend to have more children than the well doing households. Rodgers *et al.*, (1989) found a negative association between child dependency and total household expenditure as well as frequency of food intake. It is clearly known that in households with high age dependence the chances of strengthening their livelihood are limited, the vice versa will either hold true (Rodgers *et al.*, 1989). With the effect of HIV/AIDS in the community as well as households the dependency ratio increases as people become sick, and as orphans are incorporated into extended families. The number of dependent family members versus productive members increases. This situation threatens food security by increasing cost and stretching limited income and food reserves (ICAD, 2001).

Children who cannot be cared for in cities are sent back to extended families in rural areas. Distribution of siblings among relatives to spread the economic burden of their care in poor household and families affected by HIV-related illness leads directly to household economic problems as adults fall sick and then cannot work, available resources are used for treatment, and other family members divert their time to provide care (UNAIDS, 2001).

2.7.4.2 Orphanage

Orphanage resulting from HIV/AIDS have been increasing and a number of studies have been conducted to establish the magnitude of the problem and identify gaps in basic

support rendered to AIDS orphans. Isaken *et al.*, (2002) estimated that in Tanzania there are about 1.1 million orphans. A large number of HIV/AIDS orphan children grow up in circumstances less than optimal for their development as limited resources restrict their family's ability to provide sufficient care. This exacerbates the deterioration of the children situation in terms of education and nutrition. A study done by Norwegian Agency for Development Co-operation (NORAD, 2002), cited by Mwakalobo (2003) in Tanzania indicated that the majority of orphans depended on themselves or on their grandparents. However, there are others who depend on their caregivers, close relatives and foster families. It was also revealed that orphans generally miss opportunities to be registered in schools, have insufficient meals, lack school uniform, shoes and usually have no pocket money (Mwakalobo, 2003). The extended family, which would have absorbed these children, is now over stretched and many relatives cannot take in orphans. Therefore, an alternative has to be established to care for these orphans (TAS/TACAIDS, 2002).

In addition, HIV/AIDS orphans run a greater risk of being malnourished and stunted growth because they have no parents. They are the first to be denied education when extended families cannot afford to educate all children in the household, if they are lucky to be cared by members of extended families like aunts, cousins, or grand parents (Mwakalobo, 2003). Moreover, they accumulate the greater burden of responsibilities as heads of households when grand parents or other guardians or caregivers die. As a consequence of AIDS orphans are often emotionally vulnerable, financially desperate and are more likely to be sexually abused and forced into exploitation situations as prostitution as a means of survival (Mwakalobo, 2003).

A study from hard hit Kagera region in Tanzania indicates that half of the orphans lack the most basic necessities (Tibaijuka, 1997). This situation suggests high rate of abandonment or surviving parent inability to take care of his or her own children. As a result, orphans are denied supply of immediate and future needs such as housing, education and food. Sometimes they are forced to seek help in streets, begging for money, which make them become vulnerable to abuse. For instance girls turn to prostitution to survive and most likely become infected just like their parents perpetuating the vicious circle (Tibaijuka, 1997). Alternatively, households headed by children are becoming more common, indicating a breakdown in the traditional support system. These children are particularly vulnerable to abuse, poor agricultural production due to inadequate knowledge, exclusion from schooling and chronic food insecurity (ICAD, 2001).

2.7.4.3 Migration

Population migration, mobility and HIV/AIDS have become global phenomena at the beginning of this millennium. Since the emergence of the HIV/AIDS epidemic, concerns have been focused on people moving between countries. It is widely recognized that migrants and mobile populations are more vulnerable to HIV/AIDS (CRHCS, 2001). Owing to the large number of migrants and mobile populations in today's world, urgent and substantial actions are critical as a response to this vulnerability. HIV/AIDS has a significant impact in out and immigration in different ways. When an individual in the household is affected sometimes members of the household tend to move far away from home because of fear of being infected and because of the HIV/AIDS stigma. This results in decrease in labour productivity in the household. On the other hand some people migrate to home after being infected and in this case members in that affected household

spend a lot of time caring for the patient instead of doing productivity activities (Pamoja News, 2003).

Declining incomes can force members of farm households to look for work in cities, and this rural urban migration can further drive the epidemic (Pamoja News, 2003). Furthermore, the affected households may be reduced to impoverished older people and children. Relatives may be unable to care for children whose parents have died, and many orphans are thus left to fend for themselves. Not surprising, severe food shortage is reported among children in the worst affected areas (Pamoja News, 2003).

The disease also forces many affected households to liquidate their assets to meet the immediate need to buy food or to pay funeral expenses. HIV/AIDS also increases rural to urban migration, as households attempt to replace incomes lost to illness and death. In developing countries, HIV/AIDS and poverty are closely intertwined in cause and effect. In developing countries HIV/AIDS originates with male migration and female prostitution in rural areas (Mwakalobo, 2003). Countries with the HIV/AIDS incidence, which are mainly in southern Africa, have a history of massive migration to work in mines. Poverty in some Asian countries forces families to send village girls to cities to become sex workers to support their families. When girls become infected, they frequently return to their villages to die (Mwakalobo, 2003).

2.7.4.4 Education

HIV/AIDS has severe impacts on the education sector performance through declining productivity of both teaching staff and students. Teachers and students are dying or leaving

school, reducing both the quality and efficiency of the education system. In 1999 alone, an estimated 860,000 children lost their teachers to AIDS in sub-Saharan Africa. In Zambia, it is reported that more than four teachers died of AIDS each day in 1998 (Mwakalobo, 2003). In Tanzania (example Kagera region), the primary enrolment rate in communities that are hard hit by HIV/AIDS is decreasing because children whose parents are sick or died of the pandemic drop out of school due to limited financial capacity to meet school expenses (Mwakalobo, 2003). In South Africa - KwaZulu-Natal Province, where adult HIV prevalence exceeds 30%, enrolment dropped by 24% in 2000 (Mwakalobo, 2003).

However, in Tanzania the government has tried to remove some of the costs in education services like school fees in primary education. But there was a considerable pressure from the World Bank and International Monetary Fund and other International Organisations to African countries, particularly those with deteriorating economic conditions to undertake major economic restructuring and this included the introduction of user charges in education services and health services which had traditionally been free (Mushi, 1995).

Apart from removing school fees, households were also required to give or pay some contribution for their children at school so that other services like food could be provided. Similarly, the acquisition of uniforms and exercise books were left to parents. Having to pay all these, it is obvious that HIV/AIDS affected households will not be able to meet school expenses and costs because the little money is available is used to meet HIV/AIDS related medical expenses (CRHCS, 2001). Hence cutting short their education reduces their future economic prospects and that of their families putting them at a high risk of food insecurity and hence malnutrition (CRHCS, 2001).

2.7.4.5 Inheritance

Widow inheritance is a marital adjustment in continuing marriage in which a brother in law or relative substitutes temporarily for a deceased legal husbands (Kapinga *et al.*, 1993). A man takes on the widow of a deceased brother or relative to permit the birth of children for the dead man. The children belong to the dead brother rather than the living one and are entitled to inherit from his estate (Magesa, 1998). But even when she was post child bearing it was still recognised that she had sexual needs, and hence care of the widow normally included sexual relations (Omolo, 2002). In that case, that arrangement for marriage is not considered as a new marriage. No more bride wealth is paid for her , and no marriage celebration takes place, for the original marriage continue to exist. If a surrogate happens to have a wife of his own the provision he makes for the widow is not regarded a second marriage. This practice is reported to be common among many societies in Tanzania and Zambia (Kapinga *et al.*, 1993).

African countries have used different strategies to curb AIDS such as promoting the use of condoms, behaviour change promotion, minimising risk of HIV transmission through blood transfusion and treatment of curable sexually transmitted diseases (STDs) within primary health care (Mikupi, 1999). The impact of education information and communication activities undertaken by various actors has registered some significant achievements, notably HIV/AIDS/ STD awareness in Tanzania. However, inspite of these strategies and marked success in raising awareness, research shows that the spread of HIV/AIDS is on the increase (Omolo,2002).

Sub Saharan African people are dying of HIV/AIDS more than any other region in the world, not because they are promiscuous, but rather because of other factors which create conditions which make them susceptible to HIV/AIDS (Lugalla, 1998). Practices like polygamy and inheritance increased the number of sexual partners to a man. Since HIV/AIDS is transmitted primarily through sexual intercourse, persons who have multiple sexual partners stand a greater chance of being infected with the virus than those who restrict their sexual contact to one partner. Findings in Kagera Tanzania reveal that men tend to either marry or engage in sexual intercourse with widows of AIDS victims if they seem to remain healthy and delay showing symptoms of AIDS. Such practices enhance the transmission of HIV/AIDS if the cause of death for the deceased is due to AIDS (Omolo, 2002).

2.8 Risk factors associated with HIV/AIDS in Tanzania

Gender inequality is one of the depriving forces behind the spread and impact of HIV/AIDS. Access to production resources such as land, credit, knowledge training and technology are determined along the gender lines with men frequently having more access to all of these than women (Pamoja News, 2003). Infection rates are higher among women, who account for 70 per cent of the agricultural labour force and 80 per cent of food production. In Tanzania researchers found that women spent 60% less time on agricultural activities because their husbands or any other member of the family were sick (FAO, 1996).

Women are more vulnerable to HIV/AIDS effects (URT, 2001) because usually they care for the sick and the dying in addition to maintaining heavy workload related to provision

and feeding the household. Women are more likely to be illiterate, of lower socio-economic status and have fewer legal rights, which limit them to have access to resources and social services. In some societies socio-cultural practices such as inability of widows to maintain access to or benefit equitably from the property of her deceased husband may further aggravate problems. The Oxford Committee for Famine Relief (OXFAM) stated that poverty, traditions and socio pressures tend to limit women's ability to express their wishes regarding choice of sexual partners and "safer sex" practices (OXFAM, 2002). Low income, income inequality and low status of women are associated with high levels of HIV infections coupled with the fact that biologically women are at high greater risk of being infected as compared to males (NACP, 2000). Labour sharing practices have been common in Africa to assist at peak labour periods, such as harvest. These systems are breaking down due to wide spread labour shortages resulting from AIDS related deaths and sickness. Widow inheritance is also responsible for the increasing transmission of HIV/AIDS within families, should the widow also be HIV positive. Conversely, some widows are left landless and without property, increasing their vulnerability to HIV/AIDS infection through survival behaviours such as prostitution.

2.9 Food accessibility in the household

At the household level access to food may be understood as a process whereby food reaches people (Ishengoma, 1998). Lorri and Kavishe (1990) defined access to food as the process and extent to which the available food can reach all members of the household during the whole year. Household food accessibility is also determined by factors such as storage, distribution and marketing, cultural behaviour, transport network, real income and pricing policies (Wagao, 1991). Other factors are demographic characteristics especially

household size and education of the spouse, these influence the consumption aspect of the household (Ishengoma, 1998).

However, purchasing power, which is largely dependent on income, determines the degree of access to food at the household level. The vast majority of those who are undernourished either cannot produce or afford to buy enough food (FAO, 1996). Seventy percent of poor in developing countries are women. They have inadequate access to means of production such as water, land, inputs, appropriate technologies and improved seeds (FAO, 1996). Yambi *et al.* (1990) reported that household may not have access to food either as producer because they have not succeeded in securing enough food for long enough or as consumers because they cannot afford to pay for the food available in the market.

Household income is an indicator of the potential access to food security. In other words, access to food is dependent on income, whether in cash or kind. This includes food produced through agricultural production or hunting and gathering as well as through cash income. Households will have stable access to food if they have viable means of procuring (produced or purchased) food that do not lead to environmental degradation (Maxwell, 1992).

Kavishe (1993) argues that among low income groups, food access apart from the problem of distribution depends mainly on the ability to buy or produce their own food. In most households, food security is achieved through great expenses by using a large proportion of their resources. A household that uses almost all of its resources to achieve food security is

highly vulnerable to a risk of becoming food insecure compared to a household that uses a smaller proportion of its resources to achieve the same goal. In time of scarcity, people tend to make more efficient decision on food purchase. Poor households who depend on food crops for their income are at greater risks of food insecurity than those who have alternative sources of income. In rural households, the main sources of income are sale of cash crops and in part, food crops, including livestock. However, incomes earned through crop sales, off farm employment and other related activities do not suffice to obtain adequate family food especially when households' own production is affected by unfavourable conditions (Ministry of Agriculture, 1996).

The Government of Tanzania has been making efforts to improve food accessibility through increasing salaries to civil servants and producer prices to farmers. However, each wage increases effective wage of producer price increase has not been felt (Kajibwa, 1992). Increase in prices may not influence agricultural production due to unavailability and high cost of inputs and unreliable markets. The income received by farmers is normally in lump sum. Although income from food and cash crops might appear high, it is not distributed equally among the family members all the year round. Findings from the study carried out in 13 surveyed areas in Africa, Asia and Latin America reported that food insecure households tended to be large and had higher numbers of dependants and tended to have younger age composition (Ishengoma, 1998).

Frequency of meals per day is an indicator of food accessibility and nutritional status. For those who have access to food they can afford more than two meals per day and under severe shortages one meal per day may not be assured (URT and FAO,1992). According to

the food and nutrition policy, eating frequencies for Tanzania are generally low on average twice or thrice times a day (URT, 1992). Diets of most people are characterised by single or a few components, example maize diet supplemented with a relish of vegetables, beans or meat. Access to an adequate supply of food is the most basic requirement of human needs and rights.

2.10 Coping strategies used by households with regard to food security

Households adopt a variety of strategies to mitigate the effect of HIV/AIDS and food insecurity. When a breadwinner dies a household is faced with limited food to meet consumption requirement. Rugalema (1998), cited by Mutangadura *et al.*, (1999) found that households cut back the number of meals when faced with food shortages. The Southern Africa AIDS Information Dissemination Service (SAFAIDS) research in Zambia as reported by Mutangadura *et al.*, (1999) found that households were buying less expensive foods as an alternative or were substituting purchased relish (a side dish served with the staple carbohydrate e.g. maize or cassava with indigenous or wild vegetables). Literature reveals that when affected households in need of food send children to live with relatives. Relatives will then be responsible for meeting the children food requirements. Relatives and friends may provide both moral and material support to the sick on the assumption of future reciprocation (UNAIDS, 1999).

Mutangadura *et al.*, (1999) reported that in Zambia and Uganda rural households couldn't meet their food requirements or obtain cash through agricultural production. Therefore they undertake a range of income generating activities such as selling of fire wood, brewing millet beer, selling livestock, building fences handicrafts, tailoring and petty trade

to supplement their income. In Malawi, households cope by doing casual labour (Mutangadura *et al.*, 1999). In Zambia some households were reported to have migrated to urban areas in search of employment so that they can remit some income to their rural areas, while some work in neighbours fields as casual labourer to earn some income. There are documented cases of children as young as 10 years old going out to work in an effort to cope with illness of their parents (Mwakalobo, 2003). Households that do not have the ability to diversify sources of income are particularly vulnerable to the pandemic. Prevailing poverty drives women into sex work as a source of income. In Malawi 12 years old girls were driven to have sex to fulfil short term income needs (Mutangadura *et al.*, 1999).

Wagao (1991) pointed out that in Tanzania residents in rural areas have diversified strategies to lessen the adverse effects of the crisis. Household members cope with food shortages by reducing the frequency of and changing the content of meals consumed daily, undertaking more income earning activities and buying or borrowing from either relatives or friends.

According to Mgondo *et al.*, (1996), poor households have difficulties in meeting their food requirements from own production. To bridge the gap especially in the pre harvest period, they rely on off -farm enterprises, reduce their food consumption as well as frequency of meals per day, sell some assets, borrow food or cash from relatives and friends and migrate. A study done by CARE (1995), in Shinyanga cited by Ishengoma (1998) indicated that strategies taken by households include the following:

- (d) **Adjustment of meals and food substitutions:** a downward adjustment in the number of meals per day and the quantity prepared per meal was the most commonly adopted coping strategy utilised by most households. Then the other common strategy is that of food substitution (Ishengoma, 1998).
- (e) **Sale of household assets:** many households have reported selling important productive and non-productive assets to meet food requirements in times of food scarcity. For example selling of household furniture like chairs, tables and radio. Another coping mechanism was borrowing from relatives / friends.
- (f) **Alternative employment and distress migration:** wage labour constitutes one of the most important coping strategies available to chronically food insecure households.
- (g) **Out migration in search of employment** is a much common phenomenon (Ishengoma, 1998).

Gathering of wild foods and food aid: Other food coping strategies mentioned include redistribution of children where many poor households send their children be cared for by relatives over a period of time when the households are experiencing difficulties in meeting livelihood needs. Tibaijuka (1997) in Kagera Tanzania reported that households sold banana (their staple food) in desperation to raise money to meet medical costs.

2.11 Status of research on HIV/AIDS and food security in Tanzania

In 1997 Tibaijuka (1997) conducted a research in Kabagiro village in Muleba district Kagera Region. The focus was on AIDS and economic welfare in peasant agriculture. This study revealed that HIV/AIDS affects the economically active age groups and hence

production has been disastrous because labour is reallocated to nurse and mourn the victims. Loss of victims themselves, orphans and old people left without satisfactory care and subsequent deterioration of their health, declining consumption and farm productivity as assets and working capital are disposed due to escalating medical bills (Tibaijuka, 1997).

Likewise Tanzania and Netherlands AIDS Support (TANESA), cited by Licre (2002) did a study on the impact of HIV/AIDS on household food security in Mwanza Region reported that food insecurity leads to reduced food consumption either in quantity or quality as some crops that are rich in nutrients are replaced by those of lower nutritional quality because they are easier to grow. At the individual level this may have consequences for the nutritional status. Increased care of the sick person in the household may reduce time available for doing other activities like agricultural production and childcare. In Arusha Region and specifically Arumeru District information on how HIV/AIDS is affecting food security is not known and hence a need to examine the impact of HIV/AIDS on household food security to fill the gap.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Overview

This chapter outlines the methodology that was used in this study. Section 3.2 describes the study area and its geographic characteristics. In the following section the research design is described and its relevance to the study, while the sampling procedure is explained in section 3.4. Sections 3.5 and 3.6 present an outline of data collection process, instrumentation and measurement of variables. Data processing and analysis is presented in section 3.7 and finally limitations of the data collection are outlined in section 3.8.

3.2 Description of the study area and justification for its selection

The study was conducted in Arumeru District, Arusha Region. Arumeru is one of the five districts in the Arusha region located to the east of Arusha town at between 35° – 37° latitudes. The district map (Fig. 4) shows the location of the study area. The total area of the district is approximately 2,966 sq.kms, which is only 3% of the total area of the region. It has a population of 516,517 (URT, 2003) accounting for 39.97% of the regional total. The district has six administrative divisions, which are divided into 37 wards, and 137 villages. Arumeru district consists of three agro ecological zones: Firstly the high land area that is 2000 – 3000m above the sea level is characterized by coffee/banana intercropping. It is located on the southern and south-eastern part of the district. Secondly the medium land area (1500 – 2000m) is found on the western and south-western side of the district. Thirdly Arumeru also includes some areas situated at high altitudes on the

northern and north eastern parts of the Meru Mountain which have a more erratic rainfall pattern.

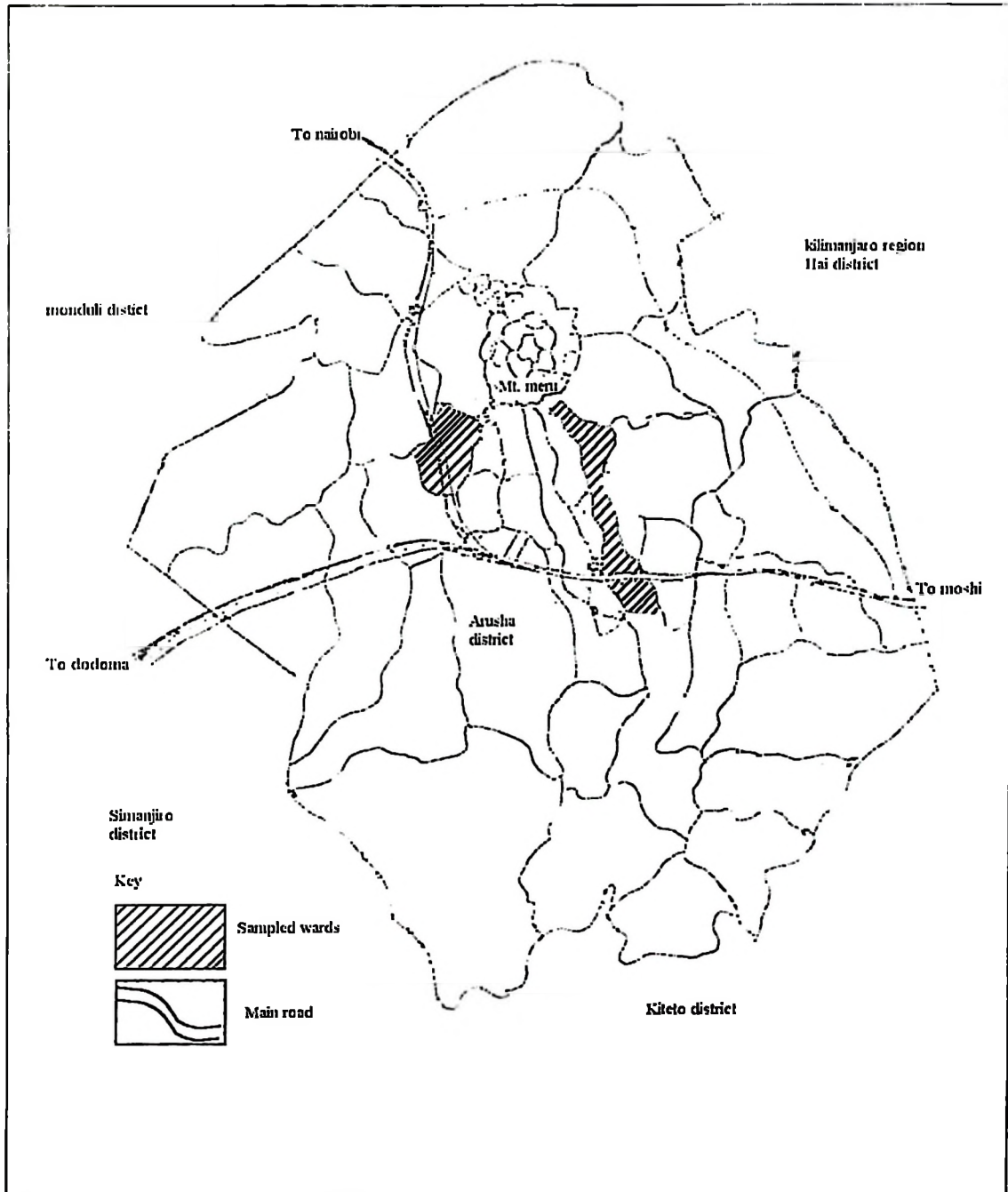


Figure 4: A map of Arumeru district showing the study areas

This area is characterized by banana/coffee intercropping, maize/bean intercropping and semi intensive livestock keeping. The low land area (800-1500m) primarily stretching towards the south and western parts of the district is characterized by flat and to some extent undulating plains (Regional Commissioners Office, 1998).

As regards to agricultural activities, over 90% of the people are involved in crop and livestock production (i.e. coffee, maize, beans). The mean annual rainfall of Arumeru district is 500 to 1400mm depending on elevation. The district was chosen for the study because it is among the leading HIV/AIDS affected areas in Arusha Region (Tengeru District Hosp. Report, 2001).

3.3 Research design

A cross-sectional research design was used in this study. According to Bailey (1998), this design allows data to be collected at a single point in time and can be used for a descriptive study as well as for determination of relationships between variables. This design was considered to be favourable because of time limit and resources available for data collection (Casley and Kumar, 1988).

3.4 Sampling procedures

3.4.1 Sample and its size

The sample was obtained from Akheri and Kimnyaki wards because the rate of HIV/AIDS is high and the sampling units were households. This sample consisted of households affected with HIV/AIDS and those not affected. The sample comprised 104 households. Half of which (52) were households affected by HIV/AIDS while 52 households were not

affected by HIV/AIDS. In this study, the affected households were defined as households that had experienced HIV/AIDS death, or households which had HIV/AIDS patients or those with HIV/AIDS orphans. Unaffected households were defined as households that had not experienced HIV/AIDS death, or households that had no HIV/AIDS patients or those without HIV/AIDS orphans. This definition was adapted in the field before data collection. It is worth noting that time constraint, resources and the concern for meaningful data analysis and accuracy interpretation dictated the choice of this sample size.

3.4.2 Sampling technique

Snowball and systematic sampling techniques were employed for selection of the households. From the selected wards, four villages were selected two from each ward. From each village, 13 households that were not affected by HIV/AIDS and 13 households that were HIV/AIDS affected were selected, to make 104 households. A snowball sampling technique was employed in selecting the households, which were already HIV/AIDS affected. In the first stage, a household of the desired characteristics was identified from each of the selected village, then after interviewing, the respondent was asked to lead the researcher to next subject/household that she/he thought had the same characteristics. Therefore, in this study the initial subjects were used to generate additional subjects. Hence the method was repeated until 52 households were obtained in the selected villages. The choice of this technique was based on its usefulness and the fact that it is difficult to select the HIV/AIDS affected households because people are not open. This research also involved the use of community counsellors who had been trained to provide counselling to the affected households.

Systematic sampling method was used to obtain households, which were not affected by HIV/AIDS. In this method, the total number of households was obtained from the village chairperson's office in each study village. The village chairperson's list of households was used to prepare a sampling frame in each village by identifying all households that were not affected by HIV/AIDS. This activity was done with the help of the village chairperson and community counsellors. The sampling interval was obtained by dividing the total number of households registered by the sample size n . For example if N was the total number of registered households in the village and n was the sample size, therefore the selected household was picked after every interval of N/n households. The sampling interval was different from each village because of different sampling frames. The first household was picked randomly.

3.5 Data collection and instrumentation

3.5.1 Primary data

The main instrument used in collecting primary data in this study was structured questionnaire containing both open and closed ended questions. The questionnaires were formulated in English and translated into Kiswahili to facilitate easy communication during data collection (Appendix I). The focus was to examine the effect of HIV/AIDS on household food security in the households in relation to the study's objectives. To ensure validity and reliability, the first draft of the questionnaire was pre- tested in six households, three of which were affected by HIV/AIDS and three were not affected by HIV/AIDS. Necessary changes were made on the basis of pre- testing results before its final administration. This included restructuring and omission of some questions.

3.5.2 Secondary data

Secondary data were obtained from Sellian Hospital, Tengeru district hospital as well as from Sokoine National Agricultural Library (SNAL). These were used to supplement the information obtained from the field.

3.6 Measurement of variables

About six background variables were investigated in this study. These variables included age, marital status, sex, household size, education level and occupation of the respondents. These variables have some influence on independent variable and they describe the characteristics of the target population.

Independent variables included, arable farmland fallowing, livestock production and labour intensive crops, income, market, inheritance, migration of family members, dependence and coping strategies used to cope with food security. The dependent variable used number of meals taken per day, number of days with inferior foods and luxury foods as its indicators.

3.7 Data processing and analysis

The collected data were edited, coded and summarized prior to analysis using the Statistical Package for Social Sciences (SPSS) computer software in conformity with the objectives of the study. Descriptive statistics particularly frequencies and percentages and means were used in the analysis. Cross tabulation involving chi- square test was used for bivariate analysis to test associations and relationships between different pairs of variables of the HIV/AIDS affected and unaffected households. Some hypotheses were tested by

using chi-square. T-test was used to compare the means of production in the affected and unaffected households as well as to test hypotheses. The study uses five per cent level of significance.

3.8 Limitations of the study

During the survey the following problems were encountered:

- (a) Availability of funds was a big problem since this research was done on private sponsorship basis. So the researcher and one assistant spent a lot of time walking on foot from one household to another during data collection instead of using reliable transport such as a vehicle.
- (b) Given the nature of this study it was difficult to collect secondary data since the majority of village offices had no list of households.
- (c) Furthermore, some respondents were not willing to give information because previous researchers had not fulfilled the promises (like bringing bags of maize and beans to the members of the community) they had made upon completion of their studies to the respondents.
- (d) In some cases, community events interrupted the survey exercise, such as funerals, village open market day, the research assistant personal commitments and government leaders public meetings.
- (e) Some respondents especially (Maasai) women were afraid of giving information because of the belief that the household head (father) is the main speaker of the household.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents results and discussion on the impact of HIV/AIDS on household food security. The first section of this chapter briefly identifies the characteristics of the sampled households. The second section examines the social problems associated with HIV/AIDS in the households while food accessibility in the household is described in the third section. This is followed by a discussion on the effect of HIV/AIDS in agricultural production. The last section provides the coping mechanisms used by households with regard to food security.

4.2 Background characteristics of the respondents

The background characteristics of the household respondents are presented in Table 2. The parameters include age and sex of respondents, household headship, household size, marital status, education level and occupation. The respondents were categorized into affected and unaffected households in order to examine the impact of HIV/AIDS on household food security.

4.2.1 Age

The selected sample for the present study comprised of 52 households affected by HIV/AIDS and 52 households not affected by HIV/AIDS. The mean average age of the respondents in the interview was 37. The respondents were grouped into five age groups. Respondents' ages ranged between 18 and 73.

Table 2: Background Characteristics of the interviewed household respondents in the affected and unaffected households in % (n=104)

Characteristics	Affected household n=52	Unaffected households n=52	Total
Age groups			
15-24	9.6	9.6	9.6
25-34	26.9	34.6	30.8
35-44	36.5	30.8	33.7
45-54	19.2	11.5	15.4
55 and above	7.7	13.5	10.6
Sex			
Male	34.6	25	29.8
Female	65.4	75	70.2
Household headship			
Male	44.2	73.1	58.7
Female	55.8	26.9	41.3
Household size			
1-5	46.2	36.5	41.3
6-10	50	63.5	56.7
11 and above	3.8		1.9
Marital status			
Single	9.6	9.6	9.6
Married	51.9	59.6	55.8
Widow	25	19.2	22.1
Divorce	9.6	5.8	7.7
Separated	4.8	5.8	4.8
Education level			
Primary education	61.5	65.4	63.5
Secondary education	5.8	9.6	7.7
No formal education	32.7	25	28.8
Occupation			
Agriculture/Liv.keepers	59.6	60.2	62.5
Mining	1.9	1.9	1.9
Housewife	5.8	7.7	6.7
Business	23.1	19.2	21.2
Self employed	7.7	3.8	5.8
Formal employed	1.9	1.9	1.9

Results show that the majority of the respondents in the affected households were in the age group of between 25-and 44. There were higher proportions of unaffected households respondents (34.6%) aged between 25 and 34 while for the affected households aged

between 35 and 44. These groups belonged to the group of economically productive people who are engaged in productive activities including food production.

4.2.2 Sex

Two thirds of respondents were females. Of the 52 the interviewed household respondents affected by HIV/AIDS, the majority (65.4%) were females. Three quarters of the respondents in the unaffected households were females.

4.2.3 Household headship

Results in Table 2 also reveal that men (59%) were more likely to be heads of the households than women (41.3%). However, households affected by HIV/AIDS were likely to be headed by females than males. The plausible reason could be death of the husband in the affected households, divorce and separation of the couples.

4.2.4 Household size

The respondents were asked to list all the persons who usually lived in the household. The research results revealed that the majority of the households (56.7%) had between 6 and 10 people in the family. The average household size in Akheri and Kimnyaki wards was 5.2 which is higher than the average household size of the district which is 4.6 (URT, 2002). The average household size in the HIV/AIDS affected households and unaffected household were 5.3 and 5.2 respectively, which were almost similar.

4.2.5 Marital status

In this study, the majority of the respondents (55.8%) were married. Very few respondents (4.8%) were separated. Findings in Table 2 also revealed higher percentage of widows in the households affected by HIV/AIDS compared to single, divorced and separated. The high percentage of widows (22.1%) in the sampled households could be due to deaths from diseases related to HIV/AIDS.

4.2.6 Level of education

Education is an important social factor in society. All respondents were requested to state their levels of education. The results revealed that illiteracy was very high (28.8%). Very few people (7.7%) had secondary education and the majority were primary school leavers (63.5%). This high level of illiteracy could be due to ignorance that is attributed to cultural reasons, which has made people fail to recognize the importance of education.

4.2.7 Occupation

The present study also looked into occupations of the respondents. As presented in Table 2, agriculture and livestock production accounted for 62.5% of the available occupations. This was followed by business, which was reported by a quarter of the household respondents. An important observation to be made is that formal employment and mining accounted for almost two percent of the occupation. This shows that in Arumeru district there are few people with formal employment. Agriculture was observed to be dominant employer in the study since most of the people live in rural area where agriculture is the main activity.

4.3 Social problems faced by household with regard to HIV/AIDS

One of the objectives of this study was to examine the social problems associated with HIV/AIDS in the household. The following variables: dependence, migration of family members, school attendance and inheritance were used to address this objective. Results in Table 3 show the social problems faced by households in the study area.

4.3.1 Dependence

Age dependency ratio is the proportion of number of persons aged below 15 years and those aged 65 and above to the number of persons aged below 15-64 years old in the population (TDHS,1997). In this study, the average age dependence ratio was found to be 175.9 meaning that the dependants outnumber the productive population. The numbers of dependants in the affected households were higher compared to those in the unaffected households. The age dependence ratio in the affected households was 180.6 while for unaffected households it was 171.3. The plausible reason for high dependence ratio in the affected households could be due to the nature of the study as any household with AIDS orphans was considered as affected household as explained in the methodology part of this research. Therefore, the presence of orphans in the households perhaps increased the number of dependants in the affected households.

Table 3: Social problems faced by households in % (n=104)

Variables	Affected households	Unaffected households	Total %	χ^2
Dependence-¹				
0-14	154	154	308	
15-64	93	94	187	
65 and above	8	7	15	
Dependence ratio	180.6	171.3		
Number of orphans				
1	23.1	66.7	31.3	
2	53.8	33.3	50.0	
3	15.4	-	12.5	0.248ns
4	7.7	-	6.3	
Mean	2.1	2.0		
Households with children who do not attend school	30.80	23.1	26.9	0.254ns
Reason for not attending School				
Lack of Uniforms	28.8	23.1	26.0	0.185ns
Lack of Stationers	28.8	23.1	26.0	0.251ns
Lack of School fees	26.9	23.1	25.0	0.325ns
Lack of transport	23.1	15.4	19.2	0.160ns
Lack of pocket money	11.5	5.8	5.8	0.081ns
Reason for Migration				
Inadequate money	28.8	26.9	27.9	0.228ns
Fear of being Infected	13.5	-	6.7	0.011*
Negative attitude	7.7	-	3.8	0.04*
Others	4.3	2	3.1	0.260ns
Widow hood status				
Living alone	90.4	81.7	86.6.4	
Inherited	5.8	13.5	9.6	0.091ns
Others	3.8	5.8	4.8	

ns not significant

** statistically significant at ($p < 0.05$)*

Dependency¹ : values for this variable are actual numbers

4.3.2 Orphanhood

In this study, orphans were defined as children who had lost their parents due to HIV/AIDS causes before the age 15. Results show that half of the households who reported to have orphans in their families had 2 orphans. However, the average number of orphans in the affected household was slightly higher compared to the unaffected households. There were no unaffected households with more than 2 orphans. The reason for the slightly high

number of orphans in the affected household could be due to premature death of the parents caused by HIV/AIDS. However chi square result did not show any significance ($p>0.05$) between the types of households and the number of orphans.

4.3.3 Education

4.3.3.1 School attendance

All respondents were asked if they had children in their households who were not going to school. About 27% of the households agreed that they had children who didn't attend school and most of them were in the affected households. Moreover respondents were requested to provide reasons, which made their children fail to attend school. According to Table 3, lack of school uniforms and stationeries were the most common reasons mentioned by the majority of the households. The study revealed that in the reported reasons the percentages for affected households were higher compared to the unaffected households. The reason for this could be because a lot of money in the affected household was being directed in medical expenses and caring for sick rather than education. Although some of the costs for education have been removed by the government the remaining costs still pose burden to the affected households compared to the unaffected households. These results are also supported by those documented by Mwakalobo (2003) where school drop out had been experienced due to lack of the capacity to meet school expenses (see section 2.6.4.4 of this study). Results of the chi square test indicated that there is no significant relationship ($P> 0.05$) in the reasons for children not attending school and household types. Although the relationship was not significant, the occurrence of higher percentages for reasons in the affected households has important social implications in the households affected by HIV/AIDS.

4.3.4 Migration

Migration of family members is common especially in families which have/had experienced HIV/AIDS death. In order to capture this, respondents were asked to report if their relatives were providing help to them when they had a patient. Respondents who responded negatively were asked to provide reasons that prevented their relatives from providing care/ help. Some of the reasons reported by the respondents for not receiving help from their relatives related to migration are summarized in Table 3. Inadequate money to care for the patients was the main reason reported by more than a quarter of the households (27.9%). Members of the households migrated to town to find employment to get money that would be sent home to replace what was lost. Pamoja News (2003) reported the same results (see section 2.6.4.3). The affected households also reported fear of being infected and wrong perception by the community. Others reported that their relatives were far away so it was difficult to get help and some were not in good terms with them. These findings show that ignorance is still a problem in this community since people migrated because they regarded HIV/AIDS as a shameful disease. Some of the relatives in the affected households migrated because of fear of being infected and others were afraid of being perceived wrongly by the community. This may lead to exclusion from social networks for those in need of social support.

Apart from this some women complained that their husbands had migrated to Nairobi to work as night guards and others to rear cattle. Furthermore, migration of their husbands put women (wives) at a high risk of being infected by HIV/AIDS because of having multiple partners which eventually could threaten food security if one partner was infected. Although land is scarce in this area, it is better if they stay at home to do casual labour to

minimize risk of infection. It is obvious that affected households have higher levels of food insecurity because migration of family members decreases the labour force and hence affects production. These results are also supported by the findings documented by FAO (2003) that women whose husbands are migrant workers are vulnerable to AIDS, as their spouses may have other sexual partners. Chi square results showed significant relationship ($p < 0.05$) between some variables such as fear of being infected and wrong perception by the community with the types of households.

4.3.5 Widowhood status

As noted in the earlier discussion, inheritance of widow is a common practice in some communities in Tanzania (Omollo, 2002). Societies regard widow inheritance as the only legitimate institution through which widows can be cared for and bear children for the deceased husband. This question was asked to find whether the practice of widow inheritance is as described in the literature. Results showed that 9.6% of the respondents in the affected households reported that widows were inherited while (86.6%) reported that widows were not inherited. Widow inheritance appears to be higher in the unaffected households compared to affected households. This could be due to the fact that most people still rely on traditions, customs and beliefs of the society.

However, widows who are inherited in the affected households could have an impact on different productive activities including food security. If the widow is HIV/AIDS positive and is inherited and if the husband had died of HIV/AIDS, she is almost likely to transfer the disease to another partner. This later have an effect on labour force and hence affect food production that may result in food insecurity in the household. Other women

respondents reported that they had been asked to be inherited but had refused. Consequently they were chased out of the clan and lost all the rights of the properties that belonged to their husbands. The probable reason for this could be that most women are generally less educated and hence ignorant, have lower status in the household and fewer legal rights, which limit their access to resources and social services.

The low income and low status of women are both associated with higher levels of HIV/AIDS. Refusal to conform to the norms of the societies is bound to bring suspicion and disapproval (Omollo, 2002). FAO (2003), has documented that some of the traditional mechanisms such as levirate the custom that obliges a man to marry his brothers widow contributes to the spread of HIV/AIDS. Unfortunately, initiatives to stop these practices may leave a widow without access to land and food leading to increased food insecurity. Chi- square results did not show any significant relationship ($p>0.05$.) between the type of the household and widow placement. Therefore the hypothesis that inheritance of widow in the affected and unaffected households by HIV/AIDS does not differ significantly is accepted.

4.4 Food accessibility in the household

The aim of this study was to examine the impact of HIV/AIDS on household food security, food accessibility was one of the objectives of the study. Sources of income, average weekly income, availability of food in the village market, main sources of daily meal, number of days with inferior foods and luxury foods were used to examine household accessibility to food. A comparison was made between four years before the research and

the year 2003 in order to get the required information. The main reason of doing a comparison was driven by the assumption that HIV/AIDS is at an increasing rate.

4.4.1 Sources of income in the affected households and unaffected

Findings in Table 4 show the sources of income in the affected and unaffected households. More than half of the respondents (61.5%) reported agriculture to be the source of income for both categories of households. This was followed by business and surprisingly most of the respondents who reported business four years previously as their source of income were in the affected households.

About a quarter of the household respondents were employed most of whom were in the unaffected households four years before this research was conducted. In 2003, the percentage of the respondents who mentioned agriculture as their source of income was 61.5% followed by 39.4% who mentioned livestock production and 27.9% mentioned business. Less than tenth of the respondents (8.7%) were employed and most of them were from the unaffected households. A close scrutiny of Table 4 shows a decline in sources of income in the affected and unaffected households. In the year 2003 employment decreased by 50% in the affected households. The plausible reason for the decrease in percentage of employment could be due to sickness, which later forced them to stop working due to ill health.

Table 4: Sources of income in the households in (%) (n=104)

Income source	Four years before survey				Year 2003			
	Affect ed house holds	Unaff ected house holds	Total	X2	Affect ed house hold	Unaffe cted househ old	Total	χ^2
Employment	7.7	17.3	12.5	0.069ns	3.8	13.5	8.7	0.045*
Business	46.2	34.6	40.4	0.115ns	25	30.8	27.9	0.256ns
Aid	9.6	5.8	7.7	0.231ns	11.5	7.7	9.6	0.276ns
Agriculture	57.7	65.4	61.5	0.21ns	48.1	63.5	55.8	0.62ns
Livestock Production	30.8	48.1	39.4	0.02*	30.8	48.1	39.4	0.035*

ns= not statistically significant

**=statistically significant at ($p < 0.05$)*

This resulted into loss of income and substantial increase in household expenditure for medical expenses and other members of the household missing work to care for the sick person. The other reason could be the collapse of parastatal organizations as a consequence of privatisation of public sectors which led to retrenchment. However, the changes in business in the households were also observed. The reason for this could be due to lack of capital because a lot of money was directed to cover medical expenses. The other reason could be inadequate time to do business because of caring for the sick at home required more time. The number of people in wage employment declined because husbands who were employed died. Widows could not get the required time to carry out more than one activity in the household due to decrease in labour force and added domestic and social responsibilities.

Nevertheless, the results from the survey revealed that agricultural productions had decreased. This could be attributed to inadequate money to buy agricultural inputs because

a lot of money is directed in medical expenses. Inadequate time to take care of the crops and land fallowing could be another reason. These findings are also supported by a study conducted in South Africa where labour shortages and reduced productivity were experienced as sick people were less productive and the time and energy of caregivers were diverted from productive activities. Production time is also lost to funeral and mourning periods (ICAD 2001). Results of the chi square test for the relationship between income sources and household showed that there was a significant relationship ($p < 0.05$) between livestock production and employment and the types of the households.

4.4.2 Average weekly income in the households

Data in Table 5 show the average weekly income of the households. The results of the study reveal that more than a quarter (26.9%) of the households received an average weekly income of between Tsh 1001 and Tsh 2000. This was followed by households which received an average weekly income of between Tsh 2001 and Tsh 3000 four years before this research. Few (3.8%) of the households earned an average weekly income of below Tsh 500 four years before this research was conducted.

The majority of the respondents (30.8%) in the affected households received an average weekly income of between Tsh 1001 and Tsh 2000 while those in the unaffected households had incomes of between Tsh 2001 and Tsh 3000 four years ago. In the year 2003, 27.9% of the sampled households earned an average weekly income of between Tsh 501 and Tsh 1000 the majority of whom were from the unaffected households.

be another reason for the change in the average weekly income. Results of the chi square test showed no significant relationship ($p>0.05$) between the average weekly income received by the households in previous years and household types.

4.4.3 Reasons for the changes in the average weekly income of the households

A decrease in the average weekly income of some respondents was observed. Respondents were asked to give reasons that decreased their average weekly income. Table 6 summarizes the reasons for the changes in average weekly income in the affected and unaffected households. Lack of capital was the main reason given by respondents for the change in their average weekly income. Other respondents mentioned sickness and about (30%) reported inadequate time to conduct their activities and hence a change in the average weekly income of the household. Inadequate time and sickness were the most important reasons reported by the affected households (Fig.5).

Table 6: Reasons for the changes in average weekly income in the households in (%)

(n=104)

Reason	Affected households	Unaffected households	Total	χ^2
Lack of capital	34.6	38.5	36.5	0.011**
Lack of time	42.3	17.3	29.8	0.01**
Sickness	7.7	-	3.8	0.003**

ns not statistically significant *** statistically significant at ($p<0.01$)*

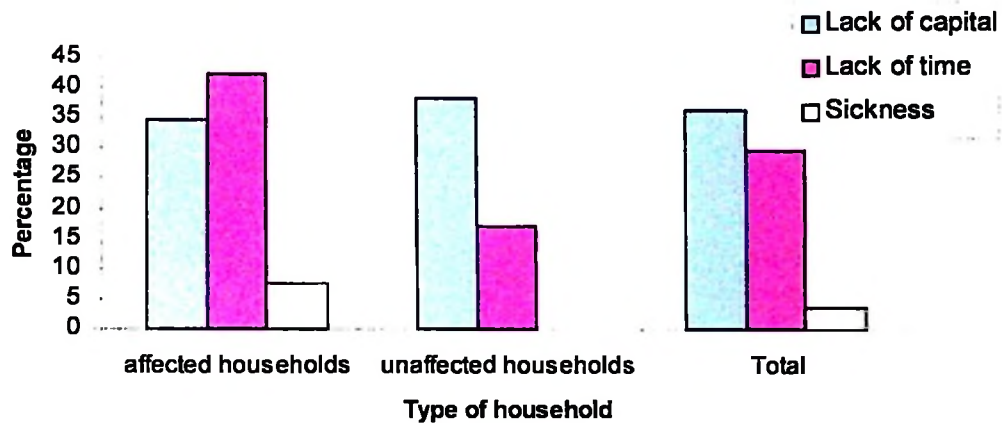


Figure 5: Reasons for changes in average weekly income in the household

Lack of capital was observed to be a problem in affected households and unaffected households by HIV/AIDS which resulted in change in average weekly income in the household. The reason for this could be fluctuation of prices in the market. Dependence on agriculture could be another reason as most people in this area coffee is the primary source of income. Fluctuation of coffee prices in the market inhibits them from continuing with production because the product is too demanding in terms of inputs and time. The chi square results showed a significant relationship between the reasons for change in average weekly income and household types. Thus, there is an association between the reasons for changes in average weekly income and the household type.

4.4.4 Availability of food in the village market

The majority of respondents (95.2%) indicated that food was available in the village market. However, some respondents complained that food prices in the village market

were not affordable. Results in Table 7 summarize the reasons which explain the inability of the households to afford prices of food in the village market.

Findings show that most of the respondents (86.5%) indicated that food was expensive and few (1.9%) mentioned fluctuation of food prices in the market and high prices of food. The majority of the respondents in the affected households reported that they failed to buy food because they were too expensive from the village market. Only 9.6% of the affected households stated both fluctuation of food prices and high costs of food. The chi square results showed no significant relationship ($p>0.05$) between the reasons reported and household types.

Table 7: Reasons for failure to purchase food in the village market in (%) (n=104)

Reasons	Affected households	Unaffected households	Total	χ^2
Food is costly	88.5	84.6	86.5	
Fluctuation of food prices and high costs	9.6	7.7	8.7	0.188ns
Fluctuation of food prices in the market	1.9	7.7	4.8	

*ns not statistically significant * statistically significant at ($p<0.05$)*

4.4.5 Main sources of daily meals in the household

The main sources of daily meals are presented in Table 8. The findings of the study show that almost three quarters (76%) of the respondents produced their own food as well as purchasing food from the market while 24% purchased from the market only. Results show that affected households are more likely to purchase food from the market compared to unaffected households.

Table 8: Sources of food used in the sampled households in % n=104

Source of food	Affected households	Unaffected households	Total	X2
Own produce and purchase from the market	73.1	78.8	76.0	0.245ns
Purchase from market	26.9	21.2	24.0	

*ns not statistically significant * statistically significant at (p<0.05)*

Over 75% of the respondents in the unaffected households produce food from their own farms but also supplement the produce with purchased food from the market. This probably could be due to the fact that HIV/AIDS affected household use a lot of time on caring for the sick in the households and therefore do not involve themselves in farming activities. Inadequate capital to buy agricultural inputs could be another reason. However, results of the chi square test proved to have no significant relationship ($p>0.05$) between the variables tested.

4.4.5 Feeding frequency

In order to get information about the household food status, numbers of meals taken per day in the households were asked. Results in Table 9 show the daily food feeding frequency in the households. In this study, taking two meals per day and below was considered to be food insecure and taking three meals per day and above was considered as food secure. Findings indicated that the majority of the respondents (48.1%) in the affected and unaffected households were taking two meals per day. More than one third (35.6%) were taking three meals and 16.3% were taking one meal per day. Results revealed that most of the affected households were taking two meals or less per day while unaffected household were taking three meals per day.

Table 9: Meals eaten per week in the sampled households in % (n=104)

Variables	Affected households	Unaffected households	Total	χ^2
Number of meals/day				
1	17.3	15.4	16.3	0.035*
2	57.7	38.5	48.1	
3	25.0	46.2	35.6	
Inferior food per week				
1	-	16.7	7.1	0.037*
2	17.5	26.7	21.4	
3	25.0	26.7	25.7	
4	40.0	26.7	34.3	
5	15.0	3.3	10.0	
7	2.5	-	1.4	
Luxury food : Meat per week				
1	81.2	47.1	58.0	0.031*
2	18.8	44.1	36.0	
3	-	8.8	6.0	
4				
Fish per week				
1	66.7	64.7	65.4	0.377ns
2	33.3	29.4	30.8	
3	-	5.9	3.8	

ns not statistically significant * *statistically significant at (p<0.05)*

The reason for the majority of affected households taking two meals per day could be due to inadequate capital to purchase food as a lot of money was being directed in medical treatment and caring for the sick in the affected households. Taking three meals per day is common in Tanzania where food is adequate and activities do not limit this food feeding regime. Results of the chi square showed that there is a significant relationship ($p<0.05$) between the number of meals taken and type of the household. Hence the null hypothesis that affected households have inadequate food consumption per day is accepted.

4.4.6 Inferior foods

Inferior foods were defined as foods that cannot provide the recommended daily intake. The types of these food that were reported by the respondents included stiff porridge

(*Ugali*) and boiled vegetables, boiled banana without cooking oil, and other spices and *Ngararum* (boiled maize and beans with bicarbonate of soda). In this study taking inferior type of food three times per week was considered to be food secure and taking inferior type of food more than three times per week was considered food insecure. It was observed that 34.3% of the households ate inferior types of foods four days per week before being interviewed. About a quarter (25.7%) reported three days and 21.4% reported to have eaten inferior foods two days per week. Only 1.4% reported eating inferior type of food throughout the week.

The research results revealed that a higher percentage of the affected households lived on inferior types of food four to seven days per week than the unaffected households. It is possible that households affected by HIV/AIDS suffer more from food insecurity compared to their counterparts. The reason for this could be due to inadequate money to buy other types of foods and spices that can improve the quality of food. The chi square results proved to have significant relationship ($p < 0.05$) between the number of days that the household ate inferior types of food and household type. Hence, it can be concluded that households affected by HIV/AIDS are more likely to survive on inferior types food than the unaffected ones.

4.4.7 Luxury foods

In this study, meat and fish were considered to be luxury foods because they are regarded as foods of high quality. Experience shows that food type consumption changes according to changes in income. The findings of the study show that about three fifths (58%) of the households reported to have eaten meat once per week before the survey. Thirty six

percent reported eating meat two days and few (6%) reported three days. However, most of the affected households ate meat once during the last seven days before the survey. On the other hand, the majority of the unaffected households ate meat twice per week during the last seven days before the survey. From the results, it can be observed that a higher percentage of the respondents who ate meat were in the unaffected households. This could probably be due to the observed fact that a lot of saving is directed to medical expenses and unforeseen precautions for the patient by the affected households. The results of the chi-square show a significant relationship ($p < 0.05$) between the number of days that the household ate meat and the households types. Hence it can be concluded that unaffected households are more likely to eat meat than affected households.

Moreover, it was observed that the majority (65.1%) of respondents reported to have eaten fish once per week before this survey. Less than a quarter of the households reported eating fish two days and few (3.8%) reported three days. Results revealed a higher percentage of the unaffected households eating fish compared to affected households. The chi-square result does not show any statistical relationship between the reported days by the households for eating fish as luxury food and the type of the household.

4.5 The effect of HIV/AIDS on agricultural production

The aim of this section is to discuss the effect of HIV/AIDS on agricultural production focusing on farming and livestock production. It shows the amount of cultivatable area within the household, the type of farming system used and types of cash and food crops grown, the amount produced as well as sold. It also explains the reasons for the changes in food crops and reasons for selling food crops as well as the type of and the total number of

land owned. Results show that the majority of the households (39.1%) owned between 0.50-1.0 hectares several years before this research was conducted.

This is followed by households, which owned below 0.50 hectare. Few households owned above 4.50 hectares in the study area. However, the majority of the unaffected households owned between 1.50 and 2.0 hectares while the majority of the affected households owned between 0.50 and 1 hectare several years before this research was conducted. In the year 2003 most of the households owned between 0.50 and 1 hectare. Less than a quarter of the households owned between 1.5 and 2.0 hectares while 11% owned below 0.5 hectare. Moreover the majority of the unaffected households had between 1.5 while 0.5 hectares and below are owned by most of the affected households.

Table 11: Percentage distribution of the respondents according to the amount of land owned (n=104)

Amount of land owned	Four years before survey				Year 2003			
	Affected house holds	Unaffected house holds	Total	χ^2	Affected house holds	Unaffected house holds	Total	χ^2
>0.5	27.9	20.4	23.9	0.118ns	59.5	10.2	22	0.398ns
0.50-1	32.6	12.2	39.1		11.9	61.2	60.4	
1.50-2	27.9	44.4	19.6		16.7	10.2	13.2	
2.50-3	9.3	12.2	10.9		9.5	12.2	11	
3.50-4	-	2.0	1.1		-	-	-	
<4.50	2.3	8.2	5.4		2.4	6.1	4.4	

ns not statistically significant ** statistically significant at (p<0.05)*

4.5.2 Reasons for not cultivating the whole farm/Changes in the amount of land used for cultivation

Findings from this research reveal changes in the amount of land ownership between the affected and unaffected households. Respondents were asked to report some of the reasons which explained the changes in the amount of land used for cultivation by the households. Table 12 summarizes the reasons for not cultivating the whole farm in the sampled households. Selling of land was the main reason reported by most (73.7%) of the households and hence the decrease in the amount of land cultivated, where as the majority of them were from the HIV/AIDS affected households. The probable explanation for the use of money obtained from the land sales could be for treatment of HIV/AIDS associated diseases in the affected households, buying of food, building houses, ceremonies and paying school fees.

Others sold land because they had social conflicts like household chaos. Inadequate money to purchase agricultural inputs was another reason reported by 45% of the respondents. This led to some areas to remain fallow. Results also show that few (15%) of the respondents reported to have started agricultural activities late. Others said they were sick and some were attending the sick. Low capital and technology was also a constraint for not cultivating the whole farm and this resulted in yield decrease. In addition some reported distributing land to their children and some had put it in collaterals because they had patients. These results are also consistent with those documented by Mwakalobo (2003), that sickness and death of an adult results in the inability of household to cultivate the whole farm. Attending to the sick can take a considerable amount of time, which is no longer available for agriculture. Thus, remote fields are left to fallow and the total output

of agriculture per unit declines. The results of the chi square test showed no statistical relationship between the reasons for not cultivating the whole farm and the household type.

Table 12: Reasons for not cultivating the whole farm in (%) (n=104)

Reasons	Affected households	Unaffected households	Total	χ^2
The land was sold	80.0	66.7	73.7	0.255ns
Inadequate money to purchase agricultural inputs	36.4	55.6	45.0	0.195ns
Late to start agricultural activities	20.0	10.0	15.0	0.275ns
<i>ns not statistically significant</i>		* statistically significant at (p<0.05)		

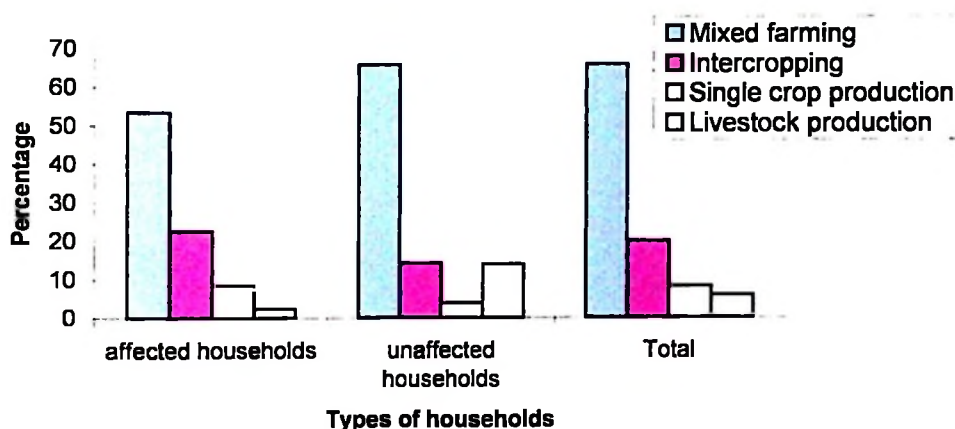
4.5.3 Type of farming practice used

Mixed farming, intercropping, livestock production and single crop production were the most common types of farming systems used by the households. Results in Table 13 show the types of farming systems used by the households. Results show that more than three fifths of the households (65.9%) used mixed farming system, about a quarter of the households used intercropping, 8.2% were livestock keepers and few (5.9%) households practiced single crop production. This study revealed that a higher percentage of the unaffected households practiced mixed farming (Fig. 7). This is common in many societies in Tanzania. Single crop production in the affected households appears to be twice as much compared to those of the unaffected households. The chi square results showed a significant relationship in the type of farming method used and the household type.

Table 13: Distribution of the households by the type of farming system in (%)**(n=104)**

Farming system	Affected households	Unaffected households	Total	χ^2
Intercropping	22.6	14.3	20	0.035*
Mixed farming	53.5	65.8	65.9	
Livestock production	2.4	14	8.2	
Single crop production	8.5	3.8	5.9	

ns not statistically significant * statistically significant at ($p < 0.05$)

**Figure 7: Distribution of respondents by types of farming system****4.5.4 Types of food crops grown, amounts produced and sold**

Research findings show that maize, beans and banana were the most popular food crops grown in the study area. To test the hypothesis that the amount of maize produced in the affected and unaffected households does not differ significantly, the average amount of maize produced five years prior to the survey in the affected and unaffected households was determined by using paired t-test as shown in the Table 14. From the results, it was one note that the average amount of maize produced in the unaffected households was twice in the quantity of the affected households. Moreover, results showed that the average amount of beans produced in

the unaffected was higher (73.69 kg) compared to the affected households. Also banana production in the unaffected household was higher than in their counterparts. It can be concluded from the results that the average amount of maize, beans and banana produced in the unaffected households was higher than in the affected households. The possible explanation of this could be due to inadequate capital and delay in farming operation activities.

Table 14: Types food crops grown, amount produced and sold in (kg)

Pairs compared	Mean	t-value	p- level
Maize production			
Affected households	35.11	-3.379	0.035*
Unaffected households	65.38		
Maize sold			
Affected households	168.80	0.107	0.915ns
Unaffected households	162.60		
Beans produced			
Affected households	51.83	-1.093	0.279ns
Unaffected households	73.69		
Beans sold			
Affected households	50.95	-0.237	0.816ns
Unaffected households	45.14		
Banana produced			
Affected households	9.02	-0.237	0.816ns
Unaffected households	10.19		
Banana sold			
Affected households	3.61	1.664	0.106ns
Unaffected households	2.61		

ns not statistically significant ** statistically significant at (p,0.05)*

Apart from that the use of the hand hoe, which reflects low technology due to inadequate money to hire a tractor and to purchase agricultural inputs such as, improved seed and fertilizer. Results of the t-test show a significant difference in the amount of maize produced in the affected and unaffected households, hence the hypothesis that the amount

of maize produced in the affected and unaffected household does not differ significantly is rejected.

Also it was observed that the amount of food crops produced by the affected households was less than the unaffected households, but the amount of produce sold by the affected households was higher compared to the unaffected households. This could be due to variations in economic hardship conditions in the affected and unaffected households. Moreover, there was no significant difference in the amount of maize, beans and banana sold in the affected and unaffected households.

4.5.5 Reasons for selling food crops

Selling of food crops was found to be common in the study area as indicated in Table 14. Respondents were requested to give reasons that made their households sell food crops. Table 15 gives a summary of the reasons for selling food crops in the households.

Table 15: Reasons for selling food crops in (%) (n=104)

Reasons for selling food crops	Affected households	Unaffected households	Total	χ^2
To obtain cash	76.1	66.7	71.3	0.028*
Inadequate money to buy storage facilities	32.6	18.8	25.5	0.163ns
No time to take care of the crops	13.0	10.4	11.7	0.174ns
Harvested in surplus	4.3	8.3	6.4	0.77ns
Others	25.0	23.3	24.2	0.423ns

ns not statistically significant * statistically significant at ($p < 0.05$)

The main reason reported by the majority (71.3%) of the respondents for selling food crops was to obtain cash. Other reasons pointed out by the respondents were inadequate money

to buy storage facilities, inadequate time to take care of the crops. A small proportion (6.4%) sold food crops because it was harvested in surplus. Results show that most of the affected households sold food crops to obtain cash. Others sold food crops to buy medicine and clothes, funeral and circumcision ceremonies, buying other varieties of foods and for paying education. This is supported by a study done by Kwambara (1997), cited by Mutangadura *et al.*, (1999) who reported that selling of agricultural produce was reported to be a dominant coping strategy to raise household income to meet additional health costs. Rugalema (1998) and Tibaijuka (1997) have reported the same that households in Kagera region sold banana (their staple food) to raise money to meet medical costs. The chi square results show a significant relationship between selling of food to obtain cash and the type of the household.

4.5.6 Reasons for the changes in food crops

Data obtained from this study show that some respondents produced more than one type of crops before this research was conducted. But following the changes in the household characteristics some households have failed to produce more than one type of crop as was the case before. Some of the stated reasons to account for this change are shown in Table 16. Results shows that 35.6% of the household respondents failed to produce more than one type of crop due to inadequate money to buy agricultural inputs. Less than a quarter of the respondents reported inadequate time to take care of the crops. Similar findings have been documented by FAO (2001), in which it was reported a decrease in yield was due to poor timing operations. Few (15%) respondents reported soil infertility and this was because most people in these areas were using farmyard manure like cow dung.

Table 16: Reasons for the changes in food crops (n=104)

Reasons for the changes in food crops	Affected households	Unaffected households	Total	χ^2
Inadequate money to buy agricultural inputs	38.1	32.7	35.6	0.027*
No time to take care of the crops	26.9	13.7	20.4	0.0075**
Soil is not fertile	17.3	11.8	14.6	0.05

*ns not statistically significant *statistically significant at (p<0.05)*

*** statistically significant at (p<0.01)*

However the quantity of manure used is no longer available at greater quantities because household sold off cattle. Also inadequate money to purchase agricultural inputs for example pesticides and fertilizers resulted in low crop yields leading to food insecurity in the household. Results of the chi square test show a significant relationship between inadequate money to buy agricultural inputs and inadequate time to take care of the crops. Hence, a shift was observed from labour intensive crops to less labour demanding ones.

4.5.7 Types of cash crops and the amounts produced

Coffee, tomatoes and vegetables were the most common crops grown in this area. Results in Table 17 show the types of cash crops and the amount produced.

Table 17: Types cash crops grown, amount produced in (kg) and baskets

Pairs compared	Mean	t-value	p- level
Coffee produced			
Affected households	95.32	-1.556	0.069ns
Unaffected households	177.46		
Tomatoes produced			
Affected households	3.10	-1.754	0.043*
Unaffected households	9.32		
Vegetables produced			
Affected households	1.67	0.788	0.211ns
Unaffected households	1.76		

*ns not statistically significant * statistically significant at (p<0.05)*

The average amount of coffee produced in the unaffected households was higher (95.32kg) than the affected households. Moreover, results revealed that unaffected households produced tomatoes thrice as much compared to the affected households. In vegetables production, the affected households produced less than the unaffected households. Findings show that the average amount of cash crops produced in the unaffected households was higher compared to their counterparts. Results of the t-test show a significance difference in the amount of tomatoes produced in the affected and unaffected households.

4.5.8 Reasons for the changes in cash crops farming

Results from the study shows that coffee was the major type of cash crop produced in this area. However, following the changes in the market and household economy some households found coffee uneconomical and shifted to other types of crops like vegetables which they said were less labour demanding compared to coffee. Other reported reasons to explain the change in the type of crop produced are shown in Table 18.

Table 18: Reasons for the changes in cash crops in (%) (n=104)

Reasons for the changes in cash crops	Affected households	Unaffected households	Total	χ^2
Inadequate money to buy agricultural inputs	52.5	23.9	37.2	0.003*
No time to take care of the crops	30.8	20.5	25.3	0.140ns
Soil is not fertile	25	10.9	17.4	0.042*

*ns not statistically significant * statistically significant at (p<0.05)*

Results in Table 18 show that 37.2% of the households failed to produce due to inadequate money to buy agricultural inputs. The other reasons reported by a quarter (25.3%) of the

respondents for the change in food crop produced was inadequate time to take care of the crops. Only 17.4% reported soil infertility. From these results it can be concluded that households affected by HIV/AIDS are more likely to change the type of food crop grown than unaffected households. Results of the chi-square show statistical significance between inadequate money to buy agricultural inputs, soil infertility and the type of the household.

4.5.9 Sources of agricultural knowledge

Knowledge transformation and skills are important to ensure mechanisms for production. Information about sources of knowledge used in agricultural production and the level of production is summarized in Table 19.

Table 19: Sources of knowledge used in agricultural production and level of production in (%) (n=104)

Source of knowledge	Four years before survey				Year 2003			
	Affect ed house holds	Unaff ected house holds	Total	χ^2	Affect ed house holds	Unaff ected house holds	Total	χ^2
Parents	79.2	90.7	84.6	0.06ns	75	81	78	0.231ns
Extension workers	16.3	36	26.9	0.016*	26.5	26.5	19.6	0.036*
Books and magazine	2.3	4	3.2	0.324ns	-	-	1.1	0.169ns
Television and radio	4.7	-	2.2	0.06ns	-	4.7	2.2	0.06ns
Level of production								
Very good	7.5	17.8	12.9		-	-	-	
Good	72.5	75.6	74.1	0.048*	26.3	38.1	32.5	0.130ns
Poor	20	6.7	13		73.7	61.9	67.5	

ns not statistically significant

** statistically significant at ($p < 0.05$)*

Results revealed that the majority (84.6%) of the households used knowledge from parents in agricultural production four years before this survey was conducted. A quarter (26.9%) of the households got the knowledge used in agricultural production from extension workers and 3% through reading books and magazine. In the year 2003 it was observed that most households (78%) obtained knowledge used in agricultural production from parents, less than a quarter (19.6%) from extension workers and very few (1.1%) from books and magazine. The results show a slight difference between those respondents who reported obtaining knowledge from parents several years before this study was conducted and in the year 2003.

Since the percentage of the households which obtained knowledge from parents had decreased in affected households it can be concluded that mechanisms for transferring knowledge are have been disrupted, due to the fact that the surviving parents are unable to transfer skills of the deceased compared to their counterparts. Chi square test revealed a significant relationship in sources of knowledge from extension workers and the type of households

4.5.10 Level of agricultural production

Respondents were requested to state the level of agricultural production of the household. Their responses are summarized in Table 19. In the past four years before the survey was conducted, about three quarters (74.1%) of the households ranked the level of production as good, 13.1% ranked their level of production to be very good and few (3.6%) reported their production to be poor. However, a change in the production was noted in the year 2003 where there were no households who reported their production to be very good.

More than half of the households reported their level of production to be poor. The reason for the change could be due to inadequate rainfall as most of the people in the study relied on rain which has become unreliable now days. Inadequate money to purchase agricultural inputs, which would make the land more productive, could be another reason. The chi square results proved to have statistical significance in the level of production that ranked as very good and the household type.

4.5.11 Types and total numbers of livestock kept

Table 20 presents the types and total numbers of livestock kept in the households. Results show that cows, goats, sheep, chicken, duck and rabbit were the common types of livestock kept in the study area.

Table 20: Types and total number of livestock kept in the household (n=104)

Pairs compared	Mean	t-value	p- level
Cattle kept			
Affected households	2.3	0.28	0.387ns
Unaffected households	2.5		
Goats kept			
Affected households	2.9	0.96	0.177ns
Unaffected households	4.6		
Sheep kept			
Affected households	1.6	-0.32	0.378ns
Unaffected households	3.4		
Poultry kept			
Affected households	5.9	1.05	0.158ns
Unaffected households	8.6		
Duck kept			
Affected households	5.7	0.97	0.254ns
Unaffected households	0.5		
Rabbit kept			
Affected households	10.5	-0.12	0.449ns
Unaffected households	-		

ns not statistically significant **statistically significant at (P<0.05)*

Results reveal that the average number of cows kept in the affected households was 2.3 and in the unaffected households was 2.5. Moreover, an average of 5.9 and 8.6 of poultry in the affected and unaffected households was also reported respectively. It can be concluded that affected households keep less labour intensive animals for example ducks and rabbit compared to the unaffected households. Results of the t-test do not show any significant difference in the number of livestock kept in the affected and unaffected households.

4.5.12 Knowledge used in livestock production

Information about knowledge that is used in livestock production is summarized in Table 21.

Table 21: Sources of knowledge used in livestock production and level of production in (%) (n=104)

Source of knowledge	Four years before survey				Year 2003			
	Affect ed house holds	Unaff ected house holds	Total	χ^2	Affect ed house holds	Unaffe cted house holds	Total	χ^2
Parents	77.8	91.5	84.8	0.033*	74.4	85.1	80	0.102ns
Extension workers	13.6	34	24.2	0.011*	16.3	31.9	24.4	0.402ns
Books and magazine	-	-	-	-	4.7	2.1	3.3	0.277ns
Television and radio	-	-2.3	1.1	0.144ns	-	-	5.6	0.286ns
Level of production								
Very good	16.1	20	18.3		-	7.3	4.1	
Good	74.2	80	77.5	0.068ns	72.7	78	75.7	0.070ns
Poor	9.7	-	4.2		27.3	14.6	20.3	

ns not statistically significant * statistically significant at ($p < 0.05$)

Results revealed that the majority (84.8%) of the households obtained knowledge used in livestock production from parents. Less than a quarter reported to have obtained it from

extension workers and very few (1.1%) from books and magazine several years before this survey. The study results revealed that most of the unaffected households reported to have obtained knowledge used in livestock production from parents several years before this research. In the 2003 it was observed that about three quarters of the households obtained knowledge used in livestock production from parents and less than a quarter (24.6%) from extension workers. Most of the unaffected households also reported obtaining knowledge from parents compared to the affected households.

4.5.13 Level of livestock production

Results in Table 21 level of livestock production in the households. The majority (77.5%) of the households ranked the level of livestock production as good, 18.3% very good and few (4.2%) poor. Furthermore the changes in the production were noted in 2003 in which there were no households who reported their production to be very good in the affected households. Only 4.2% of the unaffected households indicated that their livestock production was very good. In general the majority of the respondents in the two sampled categories reported that livestock production was good. Results also show that the level of production has decreased but this applies mostly to the affected households. The chi square results proved to have no statistical significance in the levels of production and the type of household.

4.6 Coping strategies used by households with regard to food security

Food shortage is common in different societies in Sub Saharan Africa. This has made households to develop different coping strategies in order to cope with this scourge (Ishengoma, 1998). This subsection examines different coping strategies that were used by

affected and unaffected households during food shortage periods. Results in Table 22 show the strategies used by both categories of households in coping with food insecurity in the study area. More than four fifths (89.4%) of the households substituted their foods with cheap commodities followed by 76% who reduced the number of meals per day and less than half (35.6%) who sold livestock. The majority (96.2%) of the affected households substituted their food with cheap commodities when they faced food shortage.

Table 22: Strategies used to cope with food insecurity in the households in (%)
(n=104)

Coping strategy	Affected households	Unaffected households	Total	χ^2
Substitute cheap commodities	96.2	82.7	89.4	0.013*
Reduce the no. of meals per day	80.8	71.2	76	0.145ns
Selling of livestock	40.4	30.8	35.6	0.153ns
Selling of household assets	34.6	11.5	23.1	0.025*
Children live with relatives	19.2	17.3	18.3	0.4ns
Child labour	26.9	7.7	17.3	0.005*
Use of stored food	3.8	13.5	8.7	0.04*
Others	7.7	11.5	9.6	0.253ns

ns not statistically significant **statistically significant at ($p < 0.05$)*

Reduction in the number of meals per day appeared to be high in the affected households while child labour appeared to be thrice as much as in the unaffected households. Apart from this it was also observed that a large percentage of the unaffected households sold livestock compared to unaffected households to cope with food shortages. Moreover few respondents (8.7) use stored food as coping mechanism and majority of them were from the unaffected households. The reason for the large percentage of the affected households to substitute their meals with cheap commodities could be due to income constraints because the majority of them were living below poverty line (they receive less than Tsh 1000 per day).

Furthermore, decrease in the level of production in the household and inadequate time to perform agricultural activities and therefore delaying farming operations could be another reason as explained in section 4.4.3 of this dissertation. Therefore, in order to prolong food intake families had to go for cheap commodities. Similar findings were also reported by Mutangadura *et al.*, 1999 as explained in (section 2.10) of this dissertation. In addition Rugalema (1998) has also Tanzania reported that some households cut back the number of meals taken per day when faced with food shortages. This was also a common strategy used by households to cope with short falls of income from one sector or individual in Ethiopia. The results are also compatible with the study conducted in Gitarama Rwanda where it was found that 88% of the household respondents had reduced the quantity of food eaten and 79% reduced number of meals taken per day while 20% had sold off livestock and other possessions (Kathmandu, 1999).

Others said that they were selling labour to more prosperous farmers for weeding and harvesting and got paid. This implies that such labourers were having shorter time to work in their fields. Apart from that some respondents reported that they undertook income generating activities like gardening, local brewing and selling of fire wood, borrow food, or cash from relatives. Again the findings are consistent with those obtained by Mutangadura *et al.*, (1999) who found that rural households that cannot meet food requirements or obtain cash undertake a range of income generating activities such as selling of fire wood, brewing millet beer, handcraft, tailoring and some work in neighbours fields so as to earn income in Uganda.

The chi square test shows statistical relationship between stored food, selling of household assets and child labour and the type of household. This shows that the coping strategies of the affected and unaffected households differ and hence a statistical relationship.

Apart from having coping strategies used to cope with food security in the households respondents also were asked about other strategies used to cope with their social life especially when they encounter problems inconsideration that the study focused on the impact of HIV/AIDS on food security. Some of the reported strategies included, selling of land, selling of livestock and aid from relatives and charitable organizations.

4.6.1 Selling of land

Respondents were asked to report if households had ever sold land four years before the survey and in the year 2003. Those who agreed were requested to report reasons for selling land. The average size of the land sold in four years before this survey was 0.9 and 1.38 for the year 2003. Results in Table 23 show the percentage distribution of respondents by reasons for selling land four years before this survey and in the year 2003.

(a) Reasons for selling land

Table 23 summarizes the reasons for selling land in the affected and unaffected households. Results show that the majority of the respondents (15.4%) sold land to obtain money for treatment, some (7.7%) for paying school fees and few (3.8%) for building houses. It was observed that the majority of the affected households sold land to obtain money to meet medical expenses while most of unaffected households sold land to obtain money for paying school fees.

Table 23: Reason for selling land and livestock households in (%) (n=104)

Reasons for selling land	Four years ago 1999-2002				Year 2003			
	Affect ed house holds	Unaffe cted househ olds	Total	χ^2	Affect ed house holds	Unaffe cted househ olds	Total	χ^2
Treatment	68.8	31.3	15.4	0.089ns	83.3	16.7	25.8	0.046*
Building a house	50.0	50.0	3.8	0.277ns	66.7	33.3	2.9	0.87ns
Paying school fees	25.0	75.0	7.7	0.115ns	7.2		1.9	0.103ns
Others	37.5	14.3	26.7	0.155ns	-	-	-	-
Reasons for selling livestock								
Treatment	53.0	46.0	25.0	0.165ns	60.0	40.0	28.8	0.189ns
Building a house	12.5	87.5	10.3	0.036*	20.0	80.0	4.8	0.108ns
Paying school fees	30.0	70	9.6	0.103ns	30.0	70.0	9.6	0.63ns
Buying clothes	33.3	66.7	2.9	0.404ns	61.5	38.5	12.5	0.156ns
Ceremony	40.0	60	4.8	0.432ns	42.9	57.1	13.5	0.181ns

ns not statistically significant

** statistically significant at $p(<0.05)$*

In the year 2003, the number of respondents who sold land to obtain money for medical treatment increased by 9.6% while for those who sold for building houses and paying school fees the percentages had decreased by 0.9 and 5.6 respectively. In view of these results it can be concluded that the affected households are more likely to sell land to obtain money to meet medical costs compared to their counterparts. Others (26.7%) reported that land was sold to obtain money to resolve traditional conflicts. The chi square results proved to have a significant relationship between selling of land to obtain money for treatment and household types.

(b) Reasons for selling livestock

Results in Table 23 show reasons for selling livestock in the affected and unaffected households. The types of livestock sold were cows, goats, sheep, and rabbits. Results show that the majority of the affected households sold livestock to obtain money for treatment four years before this survey. Few respondents (4.8%) reported traditional ceremonies like male circumcision. However Chi square results showed a significant relationship ($p < 0.05$) between selling of livestock to obtain money for building and household type. On the other hand in the year 2003 more than half of the households reported selling of livestock to obtain money for treatment. Selling of livestock to obtain money for traditional ceremonies increased thrice as much compared to 1999-2002. Results further show that the majority of the affected households sold livestock to obtain money for treatment than unaffected households. Results of the chi square test did not show significance ($p > 0.05$) between the selling of livestock and the type of household.

4.6.2 Aid received

Different organizations and relatives provided some aid to the affected households. The rationale of the question on aid was to identify organizations or groups that were providing support to the households in the study area. The types of aid received by the affected households came from relatives, churches, HOSPICE and WAMATA, for unaffected households the aid comes from relatives only. These organizations provided basic nursing and medical care to people with AIDS. They also provided, moral, social and spiritual support to patients and family members in the households affected by HIV/AIDS. These aid organizations use community counsellors to deliver these services. The findings are similar to those in Zambia as reported by Piwoz *et al.*, (2000) where a home based care

program provided basic nursing, emotional, social and spiritual support to patients and family members affected by HIV/AIDS. Other services provided include practical help for caring for the sick and information dissemination to misconceptions about HIV/AIDS. The program work through community organizations and uses volunteers as its front line workers.

(a) Types of aid received in the households

Table 24 shows the types of aid received by the affected and unaffected households. Results show that a quarter of the households received maize followed by beans (22.1%) and very few (2.9%) received medicine several years prior to the survey. It was observed that in all types of aid received, aid was higher in the households affected by HIV/AIDS compared to the unaffected households. The chi square results showed statistical significance ($p < 0.05$) between the money received and households types several years before this survey. In 2003 respondents, mainly from the affected households reported to have received beans and maize from aid organizations. Preble and Piwoz (1999) reported similar finding were by different aid organizations provides maize meal, high-energy protein supplement, beans cooking oil, and salt to the families affected by HIV/AIDS. The chi square results did not show any statistical significance ($p > 0.05$) between the types of aid received and household types in the year 2003.

(b) Uses of aid in the households

Table 24 summarizes the uses of aid received in the affected and unaffected households. Results show that majority (27.9%) of the affected households used aid received for food and some (16.3%) for treatment. On the other hand, use of aid for food and treatment were

also reported by the two types of household in the year 2003. Results of the chi square test showed no significant relationship between the use of aid received four years ago and in 2003 and the household type.

Table 24: Types and uses of aid received in the households in (%) (n=104)

Type of aid received	Four years before survey				Year 2003			
	Affected household	Unaffected household	Total	χ^2	Affected household	Unaffected household	Total	χ^2
Maize	28.8	21.2	25	0.312ns	9.6	7.7	8.7	0.234ns
Beans	25	19.2	22.1	0.386ns	15.4	11.5	13.5	0.239ns
Cooking oil	1.9	1.9	1.9	0.2498ns	5.8	1.9	3.8	0.239ns
Cow	-	1.9	1	0.289ns	-	-	-	-
Money	26.9	9.6	18.3	0.012*	9.6	5.8	7.7	0.261ns
Medicine	5.8	-	2.9	0.105ns	3.8	-	1.9	0.148ns
Uses of the received aid								
Food	30.8	25	27.9	0.402ns	21.2	15.4	18.3	0.233ns
Treatment	23.1	9.6	16.3	0.08ns	14	9.8	11.9	0.402ns
Business		1.9	1	0.177ns				

ns not statistically significant

** statistically significant at ($p < 0.05$)*

(b) Uses of aid in the households

Table 24 summarizes the use of aid received in the affected and unaffected households. Results show that majority (27.9%) of the affected households used aid for food and some (16.3%) for treatment. On the other hand, use of aid for food and treatment were also reported by the two types of household in the year 2003. Results of the chi square test showed no significant relationship between the use of aid received four years ago and in 2003 and the household type.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECCOMENDATIONS

5.1 Overview

The previous chapter presented and discussed the major findings of the study. In this chapter conclusions and recommendations for policy development, community, households and suggestions for further research are also given.

5.2 Conclusions

The following conclusions are made from the findings of the study

- (a) It was noted that the family size in the affected households were large compared to their unaffected households. Large family size is difficult to feed especially when it is composed of too many children or too many old people. Higher percentages of widows were found in the affected households due to HIV/AIDS deaths.

- (b) Age dependence ratio was higher for the affected households. This might be a burden to these households because of having a lot of dependants which affect food security. However, the average number of orphans was higher in the affected households compared to the unaffected households. Having a large number of orphans result in increasing dependence in the household and this further threatens food security in the household. Lack of school uniform, stationeries and school fees were the main reasons cited for children's failure to attend school. Inadequate money for caring the patients was the main reason for migration of family members. This resulted in decrease in the labour force in the affected households.

Inheritance of widow was higher in the unaffected households because of traditions, customs and beliefs.

- (c) Agriculture, business and livestock production were the main sources of income in the affected and unaffected households. The average weekly income was found to be Tsh 1001 to 2000Tsh four years before this survey while in 2003 the average weekly income was Tsh 500 to Tsh 1000 for both types of households. However the main reason for the change in the average weekly income was inadequate capital which was reported by the majority of the affected and unaffected households. The Majority of the unaffected households (76%) produced food from their own farms and purchased from the village market but storage of food was inadequate a clear indication of food insecurity at the household level. Feeding frequency of the majority of the households was two times per day of which most of them were in the affected households.
- (d) Substitution of food with cheap commodities, reduction in number of meals taken per day, selling of livestock was the main dominant coping strategies during food shortages in the affected and unaffected households. Child labour and sending children to live with relatives also contributed to these coping strategies although higher percentages were in the affected households.
- (e) Decrease in food and cash crop production in the affected households by HIV/AIDS was observed. The main reason for the decrease was inadequate money to buy agricultural inputs. Other reasons such as inadequate time to take care of the

crops and soil infertility diseases and drought were also reported. The main reason for selling agricultural produce was to obtain cash in order to purchase other households needs, to avoid losses due to lack of durable storage facilities, inadequate time to take care of the harvested crops and some harvested of surplus. Most of these reasons were cited by the affected households except harvesting in surplus, which was reported by the majority of the unaffected households. Apart from that majority of the households from the unaffected households obtained knowledge used in agriculture and livestock production from parents.

5.3 Recommendations

5.3.1 Programmes/Policy

- (a) Education and sensitisation like training in issues pertaining to food security and HIV/AIDS should be provided to change people's attitude towards widow inheritance which is one of the ways of transmitting HIV/AIDS. Education should also be provided to change peoples attitude towards people affected by HIV/AIDS and families that have been affected by HIV/AIDS. Again women should be educated how to practice safer sex (for example the use of condoms). This will help to decrease the chances of transmission.

- (b) Small micro credit organizations should focus on the rural poor so as to raise their living standards. Access to resources i.e. knowledge, credit and land must be improved for households affected by HIV/AIDS but also for other poor households. Interventions should be designed to help reduce stigmatisation of HIV/AIDS victims. Other intervention may be in the sphere of labour saving

devices, micro credit system, and farmer field schools especially for orphans and female farmers. They should promote on farm and off farm income generating activities by facilitating women access to credit, tools and other inputs.

- (c) Information on the importance of good nutritional status should be made available. Nutritional education and communication strategies should include dietary recommendations for individuals suffering from the HIV/AIDS disease taking into account local food sources and production system. Better nutrition may increase people's years of productivity and reduce their vulnerability to the HIV/AIDS related diseases. This can be done by providing leaflets and posters which give information about nutrition.

5.3.2 Community level

- (a) Customary laws and practices concerning access to resources and land should be reviewed to ensure that livelihood of widows, orphans and other poor HIV/AIDS affected households are protected.
- (b) Members of the community should be trained to practice livestock diversification where small livestock including chicken, ducks and goats could replace the cattle which have either sold or require intensive labour efforts. Small livestock require less care and can provide access to small amount of incomes quickly.

5.3.3 Household level

- (a) Extension workers should train affected and unaffected households to produce less labour demanding crops which are resistant to drought, diseases and pest infestations.**

- (b) People should be encouraged to process fruits like tomato paste to avoid selling them at cheap prices in the market when bumper harvests occurs.**

- (c) Households should be motivated and encouraged to stock their crop produce after harvest. They should be discouraged from their practice of selling food crops. In order to achieve this households should be encouraged to diversify agriculture through increasing number and types of crops that an grow well in their agro- ecological zone.**

- (d) Measures such as stocking enough food for home consumption and sale of surplus when prices are conducive should be taken.**

The study recommends the following for future research:

- (a) The study found the changes in the sources of income in the households. Therefore, a research on the effect of HIV/AIDS on non-agricultural activities is important.**

- (b) Since inheritance was also found to exist it is better to research on the extent to which customs and traditions increase the rate of HIV/AIDS transmission by establishing reasons which account for its persistence.**

(c) The effect of HIV/AIDS on socio economic characteristics of the Maasai is another area worth investigating. However the sample size to be used for these studies should be increased and being compared to other studies which were done in areas which are hardly hit by HIV/AIDS.

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APPENDICES

APPENDIX 1 : QUESTIONNAIRE FOR HOUSEHOLDS

HOUSEHOLD IDENTIFICATION

1. Date.....
2. Name of the district.....
3. Name of the interviewer.....
4. Questionnaire number.....
5. Name of the ward.....
6. Head of the householdM/F

BACKGROUND INFORMATION

7. Sex of the respondent..... M/F
8. What is your age?yrs
9. What is your marital status of the respondent
 - i) Single
 - ii) Married
 - iii) Widowed
 - iv) Divorced
 - v) Separated
 - vi) Others (specify).....
- 10 What is your occupation
 - i) Agriculture/livestock keeping
 - ii) Mining
 - iii) House wife
 - iv) Business
 - v) Self employed
 - vi) Formal employed

11. What is the total number of people living in this household

Name	Age	Sex

AGRICULTURAL PRODUCTION

12. Do you produce your own food Yes / No

13. How many hectares of cultivable land did you own five years ago...hectares

14. How many hectares of land do you own now.....hectares

15. If the area for cultivation has been reduced give reasons

1. Lack of resources to purchase agricultural inputs.
2. Poor timing for essential farming operations.
3. You sold because you want to obtain cash
4. Others (specify)

16. During the last five years what types of food crops did you cultivate...

Year	Type of crop	Quantity produced	Quantity sold

17. What types of crops do you cultivate now

Year	Type of crop	Quantity produced	Quantity sold

18. During the last five years which types of cash crops did/were you cultivating

Type of cash crop	Quantity produced	Quantity sold

19. If change has occurred give major reasons for that;

1. Lack of resources to purchase inputs
2. Don't have time to take care of the crops
3. Low soil fertility
4. Others (specify)

20. Why did you sell some of your food crops?

1. Lack of resources to purchase storage facilities
2. Don't have time to process the food
3. Want to obtain cash
4. Surplus
5. Others (specify)

21. Which types of cash crops do you cultivate now

Type of cash crop	Quantity produced	Quantity sold

22. If change has occurred give the major reasons for that...

1. Lack of resources to purchase inputs
2. Don't have time to take care of the crops
3. Low soil fertility
4. Others (specify)

23. During the last five years where did you get knowledge that you use in agricultural production?

- 1) From parents
- 2) Extension workers
- 3) Reading magazines and journals
- 4) Listening from radio, watching TV

24. Where do you get knowledge that you use in agricultural production now?

- 1) From parents
- 2) Extension workers
- 3) Reading magazines and journals
- 4) Listening from radio, watching TV

25. Please rate the quality of the shamba in producing five years ago

- 1) Excellent
- 2) Good
- 3) Poor

26. Please rate the quality of the shamba in producing now

- 1) Excellent
- 2) Good
- 3) Poor

27. Which farming system do you use

- 1) Mixed cropping (Intercropping)
- 2) Mixed farming (Livestock and crops)
- 3) Livestock production
- 4) Single crop production

28. Which farming practice do you use
- 1) Contour
 - 2) Mulching
 - 3) Composting
 - 4) Other farming practises

29. Do you keep livestock Yes/No

30. During the last five years what types of livestock did you kept?

Type of livestock	Number owned

31. What types of livestock do you keep now?

Type of livestock	Number owned

32. Give main reasons for the decrease in number of livestock.

.....

33. Please rate the quality of livestock production five years ago and

- 1) Excellent
- 2) Good
- 3) Poor

34. Please rate the quality of livestock production now

- 1) Excellent
- 2) Good
- 3) Poor

35. Where do you get knowledge that you use in livestock production five years ago?

- 1) From parents/friends /relatives
- 2) Extension workers
- 3) Reading magazines and journals
- 4) Listening from radio, watching TV

36. Where do you get knowledge that you use in livestock production now?

- 1) From parents
- 2) Extension workers
- 3) Reading magazines and journals

COPING STRATEGIES

37. Have you ever sold a piece of land five years ago?..... Yes/No

38. If Yes what is the total area sold? hectares

39. Give reasons for selling land.....
.....
.....

40. Did you sell a piece of land this year? Yes/No

41. If Yes what is the total area sold? hectares

42. Give reasons for selling land.....

43. Have you ever sold livestock five years ago? Yes/No

44. If Yes give the following information

Type of livestock sold

45. Give reasons for selling livestock

46. Did you sell livestock this years ? Yes/No

47. If Yes give the following information

Type of livestock sold

48. Give reasons for selling livestock

.....

49. Have you ever received any kind of aid from your relatives five years ago? Yes/No

50. If Yes what type of aid did you receive.....

51 What did you do with/give reasons for receiving the aid.....

52. Did you receive any kind of aid from your relatives this year? Yes/No

53. If Yes what type of aid did you receive.....

54. What did you do with/give reasons for receiving the aid.....

55. When you have food shortages which coping mechanism do you use to meet household requirement

- 1) Use stored food
- 2) Selling of livestock
- 3) Reduction in number of meals per day
- 4) Selling of household assets
- 5) Substitute cheaper commodities (eg porridge instead of ugali
- 6) Send children to leave with relatives
- 7) Child labour
- 8) Others (specify)

SOCIAL PROBLEMS FACED BY HOUSEHOLD

56. Among children whom are less than 14 years old in this household, is there any one who is an orphan? Yes/ No

57. If Yes how many orphans are in this household?.....

58. Do you have children who do not attend school? Yes /No

59. Tick the following for the reasons which make your child failed to attend school

- 1) Uniforms
- 2) School fees
- 3) Stationeries
- 4) Transport
- 5) Pocket money for meals
- 6) Others (specify)

60. When one of your family member is sick does all member of the family cooperate for caring? Yes/No

61. If no why

- 1) Some migrate from home because of fear of being affected
- 2) Lack of money to care the patient
- 3) Wrong perception by the community
- 4) Others (specify)

62. When it happens that, one of your family member have/had lost his/her partner

where did the widow/ go

- 1) Inherited
- 2) Remain at his/her usual place
- 3) Others

HOUSEHOLD'S ACCESSIBILITY TO FOOD

63. During the last five years what were the main sources of income?

- 1) Agriculture
- 2) Business activities
- 3) Employment
- 4) Livestock production
- 5) Aid

64. What ere the main sources of income now?

- 1) Agriculture
- 2) Business activities
- 3) Employment
- 4) Livestock production
- 5) Aid

65. If there is a change in sources of income give reasons

66. What was your average weekly income from activities mentioned above during the last five years

- Below 500 Tsh
- 501-1000
- 1001-2000

2001-3000

3001-4000

4001-5000

Above 5000Tsh

68. What is your average weekly income from activities mentioned above now:

Below: 500 Tsh

501-1000

1001-2000

2001-3000

3001-4000

4001-5000

Above 5000Ts

69. If there is a change in average weekly income give reasons

70. How many times per day do you take food.....

71 .Is food available in the village market Yes/ No

72. Are the prices affordable Yes/ No

73. If no why?

1) Expensive

2) Fluctuation of food prices

3) Others

74. What is the main source of your daily food

1) Own produce

2) Purchased from the market

- 3) Gathering from the wild
- 4) Own produce and purchase from the market
- 5) Others (specify)

75. During the last seven days, for how many days were the following foods served in the main meal eaten by the household?

Luxury foods	Number of days served

76. During the last seven days, for how many days did a main meal consist of an inferior food only?.....

THANK YOU