Impact, of HIV and AIDS on Rural Agricultural Production and Food Security in Chivi and Makoni Districts

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Report Compiled By

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Special Thanks to Development Data Consultants
16 St Dominics Data
Milton Park

21 August 2007

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
FANRPAN	Food, Agriculture and Natural Resources Policy Analysis Network
FOSENET	Food Security Network of Zimbabwe
HIV	Human Immuno-deficiency Virus
HVI	Household Vulnerability Index
NGO	Non Governmental Organizations
SLF	Sustainable Livelihoods Framework
SPSS	Statistical Package for Social Scientists

Desk Study Literature Review

This is a literature review of the impacts of HIV and AIDS on food security, with special emphasis on household vulnerability. The literature review focuses more on available information in Sub Saharan Africa, though with other examples from African countries. This study also focuses more on available literature on the impacts of the epidemic on agriculture mainly because the agricultural sector plays a crucial role in the economy of most African countries in terms of both sources of food and exports to finance food imports. An average of 80 % of the population of most African countries depends on agriculture alone for livelihoods. In Zimbabwe for instance, the agricultural sector contributes up to 28% of GDP and accounts for 26.9% of total employment (Country Watch, 2000). Up to 80% of Zimbabwe's population, just like many other African countries also depends on subsistence agriculture alone for livelihood, and this number is rapidly increasing due to the current macro- economic climate that is causing increased unemployment.

However, although the study focuses more on the impact of HIV and AIDS on agriculture, it is not limited to this specific sector. This is because examining specific issues risks losing the overall picture. It is possible to find households in Africa that are also engaged in other activities besides agriculture, and which are their main sources of livelihoods. In such cases therefore, for example a drop in agricultural production might not really affect their household food security situations, as this would not be their main source of livelihood. Therefore this literature review will also encompass impacts of HIV and AIDS on such other sources of livelihoods that might contribute to household food security such as formal employment.

This desk study adopts a sustainable livelihoods approach by focusing on how HIV and AIDS affects the primary factors (capital) that significantly contribute to rural livelihoods and household food security, viz physical, social, financial, natural and human capital. The information from this study is meant to inform and guide a future field study by FOSENET on the impacts of HIV and AIDS on food security in 2 districts of Zimbabwe, Chivi and Makoni districts. Therefore, this study will also explore deeply the livelihoods of these two districts so as to give adequate background information about the two districts for better analysis after the fieldwork.

The data for this desk study was collected through a comprehensive review of secondary documentary sources and the use of a semi- structured document review checklist. The prominent sources from which the data was collected were the Central statistics Office (for demographic data for the 2 Zimbabwean districts), UNAIDS reports (for the HIV and AIDS epidemic update), FAO reports and also available literature about Africa from scholars

Key Findings

The findings from this review reveal that generally food security in the SADC region and Africa in general has been undermined by rising HIV infection. This is brought by (i) the loss of adult labour, arguably the most important resource upon which livelihoods are built in Africa, (ii) changing household structures, whereas the household is the basic institution through which livelihoods are carried out, and (iii) the increase in non productive expenditures that draw resources away from productive endeavors. HIV and AIDS is therefore exposing affected households to both the risk of losing productive assets ,labour ,wage income ,and also the ability of these households to cope ,hence these households are vulnerable.

However, it is important to note that HIV and AIDS is such a complex problem affecting the socio, economic, medical among other areas. It is often difficult to clearly exemplify the impact of the pandemic, apart from other causes on food security. The actual manner in which the disease influences food security is also context specific. This however does not take way the consensus that HIV and AIDS has impacted heavily on food security.

According to the UNAIDS 2006 AIDS epidemic update, Southern Africa remains the epicenter of the global HIV epidemic: 32% of people with HIV live in this sub region and 34% of AIDS deaths globally occur there. The only evidence of declining national adult HIV prevalence in Southern Africa comes from Zimbabwe ,where both HIV prevalence and incidence have fallen(UNAIDS ,2005).HIV infection levels have fallen from 32% in the early 2000 to 24% in 2004,while prevalence declined to 21% in mid 2004 from 36% in 1996 (Mahomva etal,2006).Meanwhile ,a downward trend in HIV prevalence has also been observed in rural populations in Zimbabwe's Manicaland province amid some evidence of sexual behavior change (Gregson etal,2006).The observed declines in prevalence appear to be related to a combination of factors such as increased AIDS awareness, relatively extensive health infrastructure and growing anxiety about AIDS mortality .In addition ,high mortality rates largely due to lack of antiretroviral drugs in the country have also contributed considerably to the decline in HIV prevalence.

Nevertheless, approximately one in five adults in Zimbabwe is living with HIV –one of the worst HIV epidemics in the world. The estimated average life expectancy for women in Zimbabwe is now among the lowest in the world: 34years.For men, it is estimated to be 37years (WHO, 2006). Food shortages, impoverishment, forced removals and drought have compelled many hundreds of thousands of Zimbabweans to migrate in search of livelihood opportunities. The possible effects of these upheavals on HIV transmission trends are not yet apparent, but could prove to be profound.

HIV and AIDS usually affect the 'prime age adults" who are the productive age group, usually the heads of households responsible for sourcing income and food for their families. As these young people fall ill and die due to HIV and AIDS they are leaving their families at risk of food insecurity. Elderly people, mostly women, are being left out to fend for the families .Due to this pandemic, there also has been an increase in the number of child headed households, who are also at risk of food insecurity as children are just left alone to look after themselves after the death of their parents. As the 'prime age adults die, they are leaving a 'void" in terms of agricultural knowledge as there is no transfer of knowledge between them and their younger counterparts. This also puts the future generations at risk of food insecurity as they are being left without knowledge on agriculture which should be their main source of income and food.

In the whole of Sub Saharan Africa, the epidemic disproportionately affects women. Women are known to produce two thirds of the world's food and in general provide 50-60% of the labour input (Commonwealth, 2001). The Gender division of labour analysis reveals that women take up two types of roles: productive (home production, market production) and reproductive roles (child bearing and rearing activities). Young women (15-24 years) are four times more likely to be HIV infected than are young men. Women in this age group are the ones who are mostly getting married, and are left in the rural areas by their husbands to look after the families. The high rate of infection among women has in particular enormous implications on food security. This is because women

provide a large proportion of total labor especially in agricultural activities such as land preparation, planting, weeding and harvesting. If these women fall sick and die due to HIV and AIDS, then there will be a considerable drop in agricultural production, which will inevitably affect food security.

HIV and AIDS also affect women more even if the husbands are the ones that are infected and die of the disease. This is because of the fact that women are barred from owning land in many African countries. If a husband dies, the wife's lack of collateral limits her ability to obtain a credit to keep the farm operational or to purchase labor saving technology.

HIV and AIDS have also resulted in many orphaned children. This increase in the number of orphans places a burden on healthy women in the communities who must care for the sick and dying, while simultaneously increasing their child care responsibilities. This dilemma compounds the effect of HIV and AIDS on agriculture because women will have less time for farming activities, and this will again result in low yields, hence inadequate food for the households.

The literature in this repot also indicates the effects of HIV and AIDS on land especially in the rural areas, the most important input for agriculture, which is also the main source of food for most African countries. Land is now used as 'cemeteries' due to more people being buried in rural areas because of high costs of urban burials and also due to the fact that most HIV and AIDS patients are often 'sent' home to die. As a result of this therefore, there is a reduction in the area left for production in the rural areas, and this therefore means that small pieces are being cultivated, resulting in smaller yields, hence food insecurity especially in the rural areas.

From this desk study, it can be seen that a lot of research has been done on HIV and AIDS on food security. However the available data also only points out to the qualitative impacts of HIV and AIDS on food security. No data is available which puts a quantitative measure to household vulnerability in the presence of HIV and AIDS, which is pivotal if effective interventions are to be implemented. To be able to address vulnerability, we need to be able to measure it, so that we can identify areas of highest priority (Thomas, 2003). Quantification of household vulnerability would be of value for policy makers and planners alike.

Furthermore, although the relationships among gender, food security and rural livelihoods have been acknowledged in the growing literature on HIV and AIDS impacts, relatively few studies provide adequate focus and empirical evidence on the gender aspects of these interrelationships amongst households. Such findings will also offer useful insights for policy formulation purposes and for the development of mitigation strategies that respond to the food security challenges to the epidemic.

Recommendations

Much of the recommendations mentioned below are recommendations on outstanding critical gaps in terms of knowledge of the pandemic that might be important in designing relevant policies and programs

1. Despite growing recognition of the role of women in securing livelihoods, there is not gender aggregated data documented on the impacts, coping strategies and even gender focused interventions to mitigate the impacts of HIV and AIDS. Such findings are necessary for policy formulation purposes.

2. HIV and AIDS impacts' on food security are complex and context specific; hence there is need for more studies to be done if interventions are to be meaningful.
3. There is need to quantify vulnerability so as to make it possible for effective interventions to be planned and implemented
4. Often it is very difficult to differentiate impacts of HIV and AIDS from other causes. More work needs to be done in this area.

PART 1: INTRODUCTION

It is now well recognized that household food insecurity in rural and urban Africa cannot be properly understood if HIV and AIDS is not factored into the analysis. This is because although the HIV and AIDS pandemic is a global concern, it is in Africa where the effects of the diseases are acutely felt. Of all the global HIV infections, about 70% are located in Africa, where 28.5 million people live with HIV and AIDS (UNAIDS 2002). The disease is now responsible for more annual deaths in Africa than any other disease. The Southern Africa sub region, in particular bears a disproportionate burden of HIV and AIDS cases. It is in most Southern African countries that the world's highest rates of infection are found, the adult prevalence rates being over 30%.

Added to this problem of HIV and AIDS is the food insecurity problem that is persistent especially in Sub Saharan Africa. The future impact of HIV and AIDS on food systems is of major concern because of the already low and declining per capita food consumption and the low level of agricultural productivity in the region. Also coping with and combating the disease in rural areas where poverty is at its highest and education at its lowest is the biggest challenge facing local African countries and even the international community. The projections of food gaps reveal the intensity of the current as well as the future food insecurity problems in Sub Saharan Africa. By 2010 this region is projected to account for 65% of the total gap to maintain consumption and 75% of the gap to meet nutritional needs even though the region's population constitutes 25% of the total population in the world (White and Robinson, 2000). The region's nutrition gap as a share of consumption (total available food supplies) is projected to exceed 10% by 2010.

Nutritional intake is also already below minimum standards in several African countries. In 14 of the 17 countries in Eastern and Southern Africa, per capita daily caloric intake is below the level required to attain a minimum nutritional standard (the calories required to sustain life with minimum activity). The nutritional vulnerability is projected to grow by 30% in the next decade (White and Robinson 2000). A domino effect follows: food supply deficits and decreased healthiness due to HIV and AIDS impair agricultural productivity through reduced food availability which further reduces agricultural productivity and may hasten the progression from HIV to AIDS in weakened HIV positive people.

Baylies (2002) notes that HIV and AIDS can, on one hand be treated in its own right as a shock to household food security, but on the other hand it has such distinct effects that it is a shock like none other. Livelihoods –based analysis of linkages between food security and HIV and AIDS show that the impact is systemic, affecting all aspects of rural livelihoods (Haddad and Gillespie, 2001); and that effective analysis of the causes and outcomes of HIV and AIDS requires a contextual understanding of livelihoods unique to a given area and or social groups (FEG, 2000).

This study examines available literature on the implications of the disease on food security, with special focus on Sub Saharan Africa.

DEFINITION OF CONCEPTS

1. **Food security**

Food security is defined by FAO (1996) as:

" *a situation whereby all people ,at all times ,have physical and economic access to sufficient ,safe and nutritional food to meet their dietary needs and food preferences for an active and healthy life."(FAO, 1996)*

2. **Vulnerability**

There are a number of definitions of vulnerability arising from different, and the following features emerge from these definitions:

> *"Vulnerability encompasses the factors that lead to variation in the impact of disease between different communities and individuals" (Bates et al, 2004)*
>
> *"Vulnerability of a person is the prospect that a person has now of being poor in the future, i.e. the prospect of becoming poor if currently not poor, or the prospect of continuing to be poor if currently poor" (Christiansen and Subbararo, 2004)*
>
> *"Vulnerability of rural households to HIV and AIDS is the capacity of households to cope with, resist and recover from HIV and AIDS infection" (Oyekale, 2004)*
>
> *"Vulnerability is a function of exposure to risk and inability to cope" (World Food Programme, 1999)*

The above definitions show that vulnerability is a generally wide concept that describes the features of a social and economic entity that determine the severity of impact on households.

PART 2: BACKGROUND TO THE STUDY

The overall goal of this research project is to contribute to improved national policy formulation by availing Zimbabwe specific data on the impacts of HIV and AIDS on food security.

The research is also expected to identify information gaps and other loopholes in terms of interventions, and build consensus amongst strategic stakeholders, through a consultative process, on what needs to be done to mitigate the impacts of HIV and AIDS on affected households.

The study will also seek to quantitatively measure household vulnerability in the face of HIV and AIDS using the Household Vulnerability Index (HVI) .The HVI will also be used to track sources of vulnerability for particular households selected in this research. This information will be used for development of appropriate intervention programmes to improve the food security situations of the affected households.

PART 3: RESEARCH METHODOLOGY

The data for this desk study was collected through a comprehensive review of secondary documentary sources and the use of a semi- structured document review checklist. The prominent sources from which the data was collected were the Central statistics Office (for demographic data for the 2 Zimbabwean districts), UNAIDS website and reports (for the HIV and AIDS epidemic update), FAO reports and also available literature about Africa from scholars

PART 4: FINDINGS OF THE DESK STUDY

4.1. OVERVIEW OF HIV INFECTION LEVELS IN SUB SAHARAN AFRICA

According to the UNAIDS 2006 AIDS epidemic update, Southern Africa remains the epicenter of the global HIV epidemic: 32% of people with HIV live in this sub region and 34% of AIDS deaths globally occur there. The only evidence of declining national adult HIV prevalence in Southern Africa comes from Zimbabwe, where both HIV prevalence and incidence have fallen (UNAIDS, 2005).HIV infection levels have fallen from 32% in the early 2000 to 24% in 2004,while prevalence declined to 21% in mid 2004 from 36% in 1996 (Mahomva etal,2006).Meanwhile ,a downward trend in HIV prevalence has also been observed in rural populations in Zimbabwe's Manicaland province amid some evidence of sexual behavior change (Gregson etal,2006).The observed declines in prevalence appear to be related to a combination of factors such as increased AIDS awareness, relatively extensive health infrastructure and growing anxiety about AIDS mortality .In addition ,high mortality rates largely due to lack of antiretroviral drugs in the country have also contributed considerably to the decline in HIV prevalence.

Nevertheless, approximately one in five adults in Zimbabwe is living with HIV –one of the worst HIV epidemics in the world. The estimated average life expectancy for women in Zimbabwe is now among the lowest in the world: 34years.For men, it is estimated to be 37years (WHO, 2006). Food shortages, impoverishment, forced removals and drought have compelled many hundreds of thousands of Zimbabweans to migrate in search of livelihood opportunities. The possible effects of these upheavals on HIV transmission trends are not yet apparent, but could prove to be profound.

HIV infection levels appear to have stabilized in Malawi, with median HIV prevalence fluctuating between 15% and 17% in 2001-1005.(National AIDS Commission Malawi,2005)In the capital ,Lilongwe ,HIV prevalence among women using antenatal services declined to 17% in 2003 from 27% in 1996.This decline has been associated with some behavioral changes in Malawi.

Overall HIV prevalence among women attending antenatal clinics in Zambia has also stayed relatively stable since the mid 1990s, and has remained at 19% between 1994 and 2004 among pregnant women aged 15-39 years. Yet the data show divergent, localized patterns and trends, with HIV prevalence increasing in rural areas (from 11% to 12% in 1994-2004). Among older pregnant women (30-39 years) in urban areas, HIV prevalence rose considerably from 24% to 30% from 1994-2004.Among young pregnant women in some urban sites, HIV prevalence has remained high (29%) during the same period, while in some rural areas infection levels almost doubled from 7% to 14% (Sandoy etal, 2006). At current levels of IV prevalence, young persons in Zambia face a 50% lifetime risk of dying of AIDS in the absence of treatment (Ministry of Health Zambia, 2005)

In South Africa some 5.5 million people including 240000 children younger than 15 years were living with HIV in 2005(UNAIDS, 2006). The latest data show a continuing rising trend nationally in HIV infection levels among pregnant women attending public antenatal clinics (from 22,4% in 1999 to 30.2% in 2005), a 35% increase. South Africa's epidemic has also reached a stage where increasing numbers of people are dying of AIDS. The latest official mortality data show total deaths increased by 79% from 1997 to 2004.A large proportion of the rising trend in death rates is attributable to AIDS (Anderson and Phillips, 2006).

Swaziland now has the highest adult HIV prevalence in the world, which is 33.4%. National adult infection levels are also high in Botswana, Lesotho and Namibia (20%-24%).In Namibia ,an estimated 230000 people were living with HIV in 2005.Adult national HIV prevalence rate was estimated at 19.6%in 2005(UNAIDS,2006).

Data from Mozambique also show a significant increase in HIV infection levels in the 21st century. The HIV prevalence in pregnant women rose from 11% in 2000 to 16% I 2004, one of the steepest increases seen in sub Saharan Africa in recent years. (Conselho de Combate Nacional ao HIV/SIDA, 2006). The fact that has been rising in young pregnant women between the ages of 15- 49 years suggests that new infections continue to increase, and may signal further growth in the country's epidemic.

From the data shown above, it can be concluded that Sub Saharan Africa is still struggling with HIV and AIDS, and this has serious negative implications on food security. Southern Africa in particular is currently experiencing the worst food security emergency in a decade. Since December 2002, at least 25% of the entire populations of the countries in this region have required food assistance. (SADC-FANR VAC, 2003). High HIV prevalence levels in the region will also exacerbate the problem.

4.2. THE IMPACT OF HIVAND AIDS ON RURAL HOUSEHOLDS AND COMMUNITIES

This section brings together some of the key observations in the existing literature concerning the impact of HIV and AIDS on food security at both the household and community level. This study adopts the Sustainable Livelihoods Framework in analyzing how households are affected by HIV and AIDS and their ability to cope with such shocks. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base. Thus the more assets a household has, the lesser its vulnerability. A household livelihood generally has five assets, i.e., human, physical, social, natural and financial capital. Household vulnerability evolves from the impact of HIV and AIDS impacts on one or all of these assets.

All research to date has recognized that, as with the case with other causes of sickness and death, the most immediate impact of HIV and AIDS is on the human capital base, principally in terms of the availability and allocation of labour. At the household level the HIV afflicted patient's labour input gradually diminishes as the patient succumbs to sickness, and the labour of other household and extended family members is often diverted to care for AIDS patients during this period, the most critical impact being when the patient becomes incapacitated before death. It is estimated that an HIV and AIDS afflicted household may lose about two years of labour by the time of the death of the patient (Rugalema, 1999). The ultimate death of a productive member of the

household constitutes the permanent loss of one source of labour (although at the same time assets will no longer be diverted to caring for the patient).

Another immediate impact of AIDS on a household is financial. Households experience a loss of financial assets in several areas: labour may be diverted from economically productive activities such as paid employment or cash crop production to care for the sick individual, and money is needed for medication and to pay for funeral costs after the inevitable death.

HIV and AIDS also affect the physical capital bases of households, by reducing the number of physical assets of households. When a family member falls ill, families usually sell of their assets, usually livestock and even some household property so as to cover medical expenses. When these ill members eventually die, livestock are also slaughtered for the funerals expenses such as food. This often leaves the families at risk of food insecurity, as they would have sold the livestock that they usually use for draught power, which therefore means that they will eventually reduce farm productivity, resulting in inadequate food for the families.

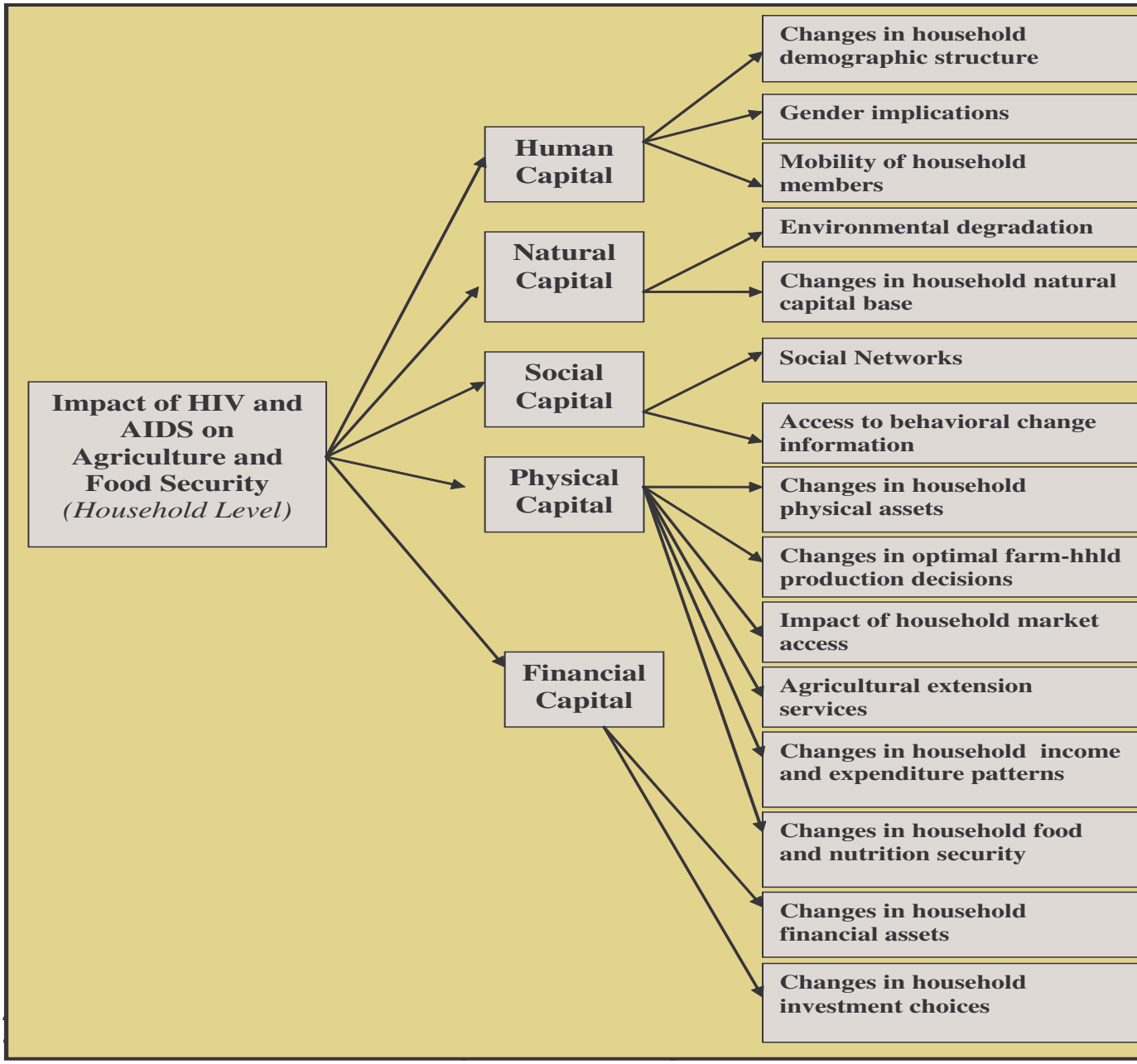
HIV and AIDS also affects family social networks in terms of support and inter and intra-relationships from government, community and other relatives, especially due to the stigma that is associated with the disease. This also makes households vulnerable due to the fact that the affected households as they are exposed.

It has also been documented that household vulnerability increases environmental degradation and access to natural capital.

Table 1 below summarizes the impact of HIV and AIDS on the 5 core areas (human, social, natural, physical and financial capital) that are important to food security.

However, an important question that arises in relation to the socio –economic impact of HIV and AIDS is whether the shock to a household caused by HIV and AIDS –related illness and death is markedly different from the impact of other illnesses and deaths that may occur. Limited and seemingly contradictory data exist to inform this debate. For example, Menon etal (1999) found out those households experiencing the death of an HIV-positive adult saw a statistically significant drop in household ownership of durable goods compared to households that experienced the death of an HIV –negative adult. However in Kagera, Tanzania, the death of an adult from AIDS was found to depress per capita food consumption by 15% in the poorest household, a similar figure for that for non-AIDS related deaths (Over, 1998).

Table 1: Impact of HIV and AIDS on the 5 livelihood assets



woman, it is eroding the skills, experience and networks that keep their families and communities going. Even before falling ill, a woman will often have to care for a sick husband, thereby reducing the time she can devote to planting, harvesting and marketing crops. When her husband dies, she is often deprived of credit, distribution networks or land rights. When she dies, the household will risk collapsing completely, leaving children to fend for themselves. The older ones, especially girls, will be taken out of school to work in the home or the farm. These girls, deprived of education and opportunities, will be even less able to protect themselves against AIDS. If we want to save Africa from two catastrophes (HIV/AIDS and famine), we would do well to focus on saving Africa's women"
Source: Kofi Annan, Secretary general of the United Nations.

In most sub-Saharan African countries, small-scale farmers, the majority of women, produce 60-70 percent of food. Women play a major role in the different aspects of agricultural production. Although men and women participate in most agricultural tasks, men predominate in land preparation, and ploughing; women are primarily engaged in

watering, planting, fertilizing, weeding, harvesting and marketing – activities that are typically labour intensive. Women work more hours per day and more days per year in agriculture than men .Cash crops are considered men's crops and men control the money received from them, even though women do considerable amounts of the work. Though performing different activities, women and men remain on par as farmers in agriculture, but unequal in some agricultural policy and planning.

HIV/AIDS has severe socio-economic impacts on both sexes but is not gender neutral. AIDS worsens existing gender-based differences in labour burdens and in accessing key resources such as land, and other resources; education; agricultural services and technology (Hadded et al, 2001). The major gender related impacts of HIV/AIDS on rural livelihoods includes: increased workload of women due to HIV/AIDS related morbidity and mortality of family membership thereby affecting their role in agricultural production and securing livelihoods, loss of non-farm income, loss of assets and decreased access to resources collapsing rural safety nets leading to increased burden of caring for orphans, increased vulnerability of women to loss of rights to land and property, withdrawal of girl children from school.

HIV/AIDS also adds to rural women's workload, as women are the traditional caregivers when people are sick. In rural areas, time spent on patient-care often directly impact on time available for agricultural production and for pursuing other non-farm income generating activities. The outcome might be less timely farming practice resulting in reduced yields or reduced land under cultivation, threatening household and eventually national food security. In northern Zambia, affected households, and in particular female-headed households, reduced the total area under cultivation due to labour shortages (FAO, 2004). In Tanzania, women spent 60 percent less time on agricultural activities because their husbands were ill (Rugalema, 1999)

Because they are overburdened, women no longer have time for non-farm activities such as artisan crafts, market gardening, food processing and others, activities that previously contributed to the family budget. This negatively impacts on their livelihood. Literature confirms that during times of crisis, women who have multiple sources of income are better off in meeting the food security and other livelihood needs of the household (Peters 1995, Maxwell and Frankenburger 1992). In cases where affected women have sold off their assets, they cannot access rural micro-credit institutions for lack of collateral. Gender differences become acute when productive resources are eroded, reinforcing the poverty and vulnerability spiral for female and children-headed households.

Impact on property and Inheritance Rights of women

Access to, ownership of, and control over property are fundamental determinants of secure livelihoods: they provide a secure place to live, a site for economic and social activity, and collateral for credit and other resources and services essential to prevent and mitigate HIV/AIDS (Aliber et al 2004, Strickland 2004). Widespread exclusion of women in developing countries from owning or controlling property, as well as limits often dictated by custom concerning their access to and use of property such as land, means that they are often barred from many of the resources that would allow them to improve their chances of preventing infection or enhance their capacity to mitigate the consequences of HIV/AIDS (UNAIDS, 2004). In countries where impacts of HIV/AIDS on land tenure systems have been studied (these include Lesotho, South Africa, Kenya, Tanzania and Malawi), one major impact of the epidemic was identified to be the increase in the vulnerability of women, children and poor households to

dispossession by patrilineal kin on the death of male household heads (Aliber et al, 2004, Topouzis, 1998, Katunzi, 1999, Rehmtulla 1999, Strickland, 2004, FAO 2004). Losing land impacts directly on the women's ability to meet household food needs through own production. In South Africa and Lesotho the studies showed traditional authorities playing a role in helping to protect the land rights of widows and orphans but not always being effective in enforcing their decisions when relatives usurped land (Drimie, 2002). The main recommendation emerging from these studies is the need to draw up legislation that can protect the land rights of women and children.

According to the recently launched UN Secretary General's Task Force Report of women, Girls and HIV/AIDS in southern African, as the death toll from AIDS is mounting, many widowed women are experiencing women are experiencing dispossession in rural areas. Women often do not have marriage certificates or other documentation to protect their rights (and will are rarely drawn up). Unfortunately many who experience dispossession lack recourse. The major obstacles that stand I the way of any woman attempting to assert her rights to property or inheritance include fear of violent reprisal, sluggish bureaucracies and official indifference (UNAIDS, 2004)

PART 5: COPING STRATEGIES IN THE FACE OF HIV AND AIDS

There is growing literature in the area of coping strategies, or household survival and livelihood strategies in response to the compounding impacts and interactions of HIV and AIDS, representing the evidence on which to build responses to the epidemic. This section draws largely on the evidence base of a number of studies and experiences, mostly Southern Africa.

The impact of HIV and AIDS and the coping strategies pursued by households are inextricably linked. Rural households adapt various coping strategies to reduce or even reverse the impacts of HIV and AIDS on their livelihoods. Coping strategies that are pursued not only depend on, but also have a cumulative impact on the assets upon which a household can draw and hence influence a household's future vulnerability (White and Robinson, 2000). These strategies can be short term sustainable or long term sustainable coping strategies. Mani (2001) states that while the responses of the poor in coping with a shock such as HIV and AIDS provide valuable clues to policy makers, their effectiveness in reducing vulnerability must be carefully assessed. This is because some of the coping strategies adopted might even exacerbate vulnerability on the part of the affected households.

Moser (1998) also points out that the ability of households to cope with HIV and AIDS greatly depends on their asset ownership. The ability of a household to cope is defined by WFP as the capacity to physically survive the shock with their livelihood more or less intact by depending on their income and other assets such as labor, physical assets, productive assets, social capital and other support systems and entitlements (Fig1)

Fig 1: Relationship between Impact of HIV and AIDS and Household vulnerability. *Adapted from WFP (VAM) and Moser (1998)*

Household Exposure to HIV and AIDS

Assets Ownership

1. Labour
2. Human capital
3. Productive assets
4. Household relations
5. Social Capital

Ability to cope

Level of Household Vulnerability

1. Coping level households
2. Acute level Households
3. Emergency Level households

Depending on the asset ownership and the subsequent coping strategies, vulnerability is expected to differ across households. Households fall into three different levels of vulnerability i.e.:

- *Coping level households* –households in a vulnerable situation but still able to cope
- *Acute level households*- households that have been hit so hard that they badly need assistance to the degree of an acute health care unit in a hospital. With some rapid response type of assistance, the family may be resuscitated
- *Emergency level households*-the equivalent of an intensive care situation (almost a point of no return) but could be resuscitated only with the best possible expertise.

SAFAIDS (1999) identified three categories of household coping strategies i.e., strategies aimed at improving food security, strategies aimed at raising and supplementing income in order to maintain household expenditure levels and strategies for alleviating loss of labour .Fig 2 below outlines the general points on the coping strategies undertaken by households. Chen and Dunn (1996) further analyzed how households were coping with impacts of HIV and AIDS and came up with a 'Household loss Management framework' which stated that coping strategies that are pursued not only depend on, but have a cumulative impact on the assets upon which a household can draw and hence influence a household's future vulnerability. The framework states that different coping strategies fall within three stages of loss management i.e., reversible mechanisms and disposal of self-insurance assets, disposal of productive assets and destitution. Fig 3 illustrates the three stages of coping against impact of HIV and AIDS.

Fig 2: Coping strategies to tackle the impact of HIV and AIDS

(i) Strategies aimed at improving food security:

- Reducing household consumption;
- Substituting some food items with cheaper commodities;
- Sending children away to live with relatives and
- Begging

(ii)Strategies aimed at raising and supplementing income in order to maintain household expenditure levels

- Diversifying income;
- Migrating to seek work;
- Borrowing;
- Selling assets and
- Drawing on savings and investments

(iii) Strategies aimed at alleviating the loss of labour:

- Intra household labour reallocation;
- Withdrawing children from school;
- Laboring for extra hours;
- Hiring labour and
- Decreasing the area cultivated

Source :SAFAIDS 1999

From Fig 2 above, it can be seen that coping strategies that are undertaken by many HIV and AIDS affected households have a downstream effect, i.e. they often leave these affected households at more risk of food insecurity, hence the households remain vulnerable.

However, although the depiction in fig 2 above provides a useful representation of some relevant issues, it does not represent the complexity of the changing impacts of illness and death in relation to the range of options available to households. For example the impact of an illness will differ depending on its timing and severity, and the death of a family member will actually transform previous diversions of labour and cash to care for the previously sick person, and so may in fact have a positive effect on resource allocation. HIV and AIDS will always be negative if one or more "prime age" adults are affected, but in some instances coping mechanisms may be adopted which mitigate the worst effects.

It will also be more useful if coping strategies are understood in relation to the resources or assets available to households, and the nature of the enabling environment, which are key factors that define the coping strategies available and affect households' vulnerability or resilience to shocks.

Fig 3: Household Loss Management (Source: Chen and Dunn, 1996)

It is also important to remember that communities are not homogenous and not all households have the same access to assets. Households within the same community may

Stages of loss Management	Strategies
I *Reversible mechanisms and disposal of self insurance assets*	• seeking wage labour or migrating to find paid work • switching to producing low-maintenance substance crops • liquidating savings accounts, selling jewellery, chicken, goats • calling on extended family or community obligations • borrowing from formal or informal credit sources • reducing consumption and decreasing spending (e.g. on education, health, etc)
II *Disposal of productive assets*	• selling land, equipment, tools or animals used for farming • borrowing at exorbitant interest rates • further reduction in consumption, education and health • reducing amount of land farmed and types of crops produced
III *Destitution*	• dependency on charity • breakdown of household • distress migration

5.1. Regional Coping Strategies: An overview

This section draws upon literature focused on Southern Africa to provide an evaluation of strategies adopted by individuals or social groups in response to the epidemic. These have been divided into three main categories, namely: labour –based strategies, consumption strategies and income strategies. A discussion of each is presented:

a) Labour based strategies

Labour based strategies generally involve trying to replace lost labour through intra household labour reallocation, taking children out of school, bringing in new family members or hiring in labour. Other studies reveal a shift in the cropping mix and areas planted as they adjust to labour shortages.

Children may also be taken out of school to fill labour and income gaps created when productive adults become ill or are deceased. Taking children out of school is used as a way of reducing expenditure, as observed in chronically ill households in Swaziland.(Muwanga,2002).Rugalema(1999) also reports the intensive use of child labour as a major strategy used by affected households within a case study from Bukoba district, Tanzania. This study illustrated how the illness affected time allocation, placed pressure on children to work, diverted household cash and led to the disposal of productive household assets.

In another study in Zimbabwe, it has been pointed out that children are removed from school to work in the fields and to care for the sick. (Senefeld and Polsky, 2005). It was found out that 12% of boys and 15% of girls had recently left school

Another labour-based strategy adopted by HIV and AIDS affected households is decreasing the area under cultivation. The Zambian Vulnerability Assessment showed that households without a chronically ill head planted on average 22% greater area in 2002/3 than the previous year, while households with a chronically household head had planted 53% less area.

Other families also shift from labour intensive crops to those crops that require less labour. According to Bailey (2005) ,in Swaziland 43% of the households that experienced an AIDS death substitutes labour intensive crops like cotton with less labour intensive crops like maize ,and moved from cash crops to subsistence crops.

b) Consumption Strategies

Consumption Strategies have generally involved the reduction in the number of meals eaten, skipping of meals for days, consumption of wild foods and begging for food from the extended family. In Malawi for example 57% of households with a chronically ill adult had skipped entire days without eating compared to households with healthy adults. (SADC FANR, 2003).

Natural capital and common property resources have been found out to increase resilience of farming systems as they serve as safety nets during agricultural shortfalls. HIV and AIDS households increase reliance on woodland activities as a coping and more consistent livelihood strategy (Barany et al, 2005) Hunger and Twine (2005) also argue that in South Africa, HIV and AIDS has contributed to changes in resource collection strategies whilst also increasing 'nutritional dependence on the local environment"

c) Income Strategies

As reiterated throughout this paper, HIV and AIDS constitutes a considerable economic shock to households .The cost of a protracted illness and the income loss of a prime –aged adult are further compounded at death by funeral expenses and the need to care for children left behind.

Increasing evidence across the region indicates that rural households are engaged in a mix of strategies for either raising or supplementing income. Income strategies range from selling of livestock and agricultural produce, selling of household assets, income diversification.

PART 6: IMPACT OF HIV AND AIDS ON FOOD SECURITY AND COPING STRATEGIES IN THE ZIMBABWEAN CONTEXT

This chapter gives an overview of available literature on the impacts of HIV and AIDS on food security in Zimbabwe and the coping strategies that have been adopted by the affected households.

Evidence on the impacts of HIV/AIDS in agriculture and coping strategies in Zimbabwe has evolved slowly over the past decade. The magnitude of the epidemic has largely been informed by case studies such as those collected and published by SAFAIDS (Mutangadura, Jackson & Mukurazita, 1999). In addition, the study done by Kwaramba in 1997 looked at the socio-economic impact of HIV/AIDS on communal agriculture generated through household surveys in two province of Zimbabwe, Mashonaland West and Manicaland. As such, the study brought attention to the epidemic and raised awareness about its impacts in the communal sector. Follow up studies by Kwaramba in 2002 and 2003 covered issues of land reform and the commercial sector in the analysis, and served to update the figures on the impact variables and relationships, income and output, comparing A1 farmers and communal farmers.

Other studies initiated by Farm Community Trust of Zimbabwe (FCTZ) have focused on the impact of HIV/AIDS and coping strategies of farm workers. Farm workers resident on commercial farms and those who have been displaced have both been exposed to the impacts of HIV/ADS (Sachikonye, 2003). Walker reports how farm worker communities are vulnerable to the impact of HIV/AIDS due to their lack of a common history and social background, isolation from other communities by large distances, lack of access to information, high levels of mobility (2002). As such, extended family structures have broken down and early marriages are common as well as poor access to health care. Prevalence rates among Farm workers in the 20-49 year of age group were estimated at higher than 25 percent (Sachikonye, 2003). Consequences of such high rates include a rise in the number of orphans and child headed households.

The Commercial Farmers' Union also carried out a research in 2004 on the impacts of HIV and AIDS on agriculture, Table 2 below shows that Zimbabwe ranks joint second in projected labour loss (23%) among the selected nine African countries. This projects negative impacts on the agricultural sector, as labour force is lost due to HIV and AIDS. This will also mean that rural people will not get adequate extension services, which will eventually lead to reduced agricultural production due to less knowledge –hence food insecurity on the part of these households. This undesirable position has to be acknowledged by policy makers so that effective strategies are developed and implemented

Table 2: Projected loss in Agriculture Labour Force through AIDS (1985-2020)

Country	Labour Force Loss
Namibia	- 26 %
Botswana	- 23 %
Zimbabwe	- 23 %
Mozambique	- 20%
South Africa	- 20%
Kenya	-17%
Malawi	- 14%

Uganda	- 14%
Tanzania	-13%

In terms of coping strategies, the Consortium for Southern African Food Emergency (C-Safe) has conducted baseline surveys in Zimbabwe to determine differences in food security and coping strategies between chronically ill households and non-affected households. The data is generalized from an emergency response project. These baselines reveal complex relationships between food security, livelihoods and HIV/AIDS (Caldwell & Huddle, 2005; Senefeld and Polsky, 2005). C-SAFE have developed a coping strategy index, a quantitative score of each household on the measure of the leave of coping helps to determine the frequency and severity of household ability to deal with food insecurity (Caldwell & Huddle, 2005)

Descriptive evidence indicating responses to HIV/AIDS- induced household labour constraints such as taking children out of school is reported in a study conducted in Gweru undertaken by Ncube (Mutangadura et al, 1999). Taking children out of school as a way of reducing expenditure was also reported in data from a baseline survey under C-SAFE (consortium for Southern Africa's Food Emergency) project (Senefeld and Polsky, 2005). Nearly 18 percent f households reported children aged 5-14 dropping out of school mostly because of inability to pay school fees. The C-SAFE project analyzed the data to determine differences in food security and coping strategies between chronically ill-affected households and non-affected households.

Empirical evidence from Kwaramba indicates that a reduction in area cultivated in response to HIV/AIDS contributes to reduced yields although situations differ according to farming systems and across the natural regions of Zimbabwe (1997; 2004). Kwaramba found that households in the communal areas of Zimbabwe that had members suffering from HIV/AIDS reduced their cattle by 29 percent along with a 61 percent reduction in maize yield (1997). The 2002 projected estimates indicated a further yield decline of 71 percent for maize, which has serious implications for food security, household income and raw material availability for agro-industries in the country (Kwaramba, 2004). The percentage yield decline was more severe under communal irrigation schemes than dry-land resettlement areas because of high input needs (Kwaramba, 2004)

Further analysis indicated a decline in yields be natural region generally becoming more severe moving down from Natural region II to Natural region IV (Kwaramba, 2004). A similar trend reported by C-SAFE showed that more than 40 percent of Zimbabwean rural households in 2003 were not culvating as much land as previously (Senefeld & Polsky, 2005). The most common sited reasons were a lack of labour (17%), lack of rainfall (62%), lack of draught power (51%), lack of fertilizer (19.7%) and lack of seed (52%).

Analysis on Zimbabwe VAC data also showed that with the presence of active adults, 33 percent of households stated that they would plant less and 60 percent stated that they would plant more area. In contrast, for households without active adults percent stated they would plant less while only 32 percent stated they would plant a larger area (SADC FANR, 2003). The FARNPAN study undertaken in Zimbabwe reported a decrease in area cultivated among households affected, with the area being increasingly used for planting maize and legumes and less on labour intensive and cash crops (Mano & Matshe, 2005). The same reports notes that there are seemingly no effects on fertilizer applications between affected and non-affected households.

A Brief Overview of the FOSENET Proposed study Sites

As has already been pointed out earlier, this desk study is meant to inform a future field research by FOSENET in two districts of Zimbabwe, Makoni and Chivi districts. Therefore it is also important to provide a brief overview of the districts in terms of the livelihood strategies normally adopted by the populations that it would also be easier to compare and even analyse the data after the field work.

Makoni District

The district is in NR 2a,which is characterized by average rainfall, hence has more potential of being food secure. It is also found in Manicaland Province of Zimbabwe A baseline survey carried out in the district by Zimbabwe Project Trust in 2006 shows that most of the people in Makoni district depend on farming as their main source of livelihood.

During the 2002 Census, Makoni had a total population: 247 993 people, and women constituted 52% of this total population. In terms of activity and Labour force**,** Makoni district had 24% of the most economically active persons in the 50+-age range, showing a growing number of elderly people still economically active.

The baseline survey report also points out that about 57% of the population in Makoni district are households headed by women and 19 % of the households were also child headed households.

Chivi District

Chivi district is in Natural region 4, which is usually a dry land are, and hence more prone to droughts and food shortages. This therefore means that the people in this district are already more vulnerable to food insecurity even before the impacts of HIV and AIDS.

CONCLUSIONS

This study has reviewed some of the key literature concerning the socio economic impact of HIV and AIDS on rural livelihood s in Africa. Much of the literature that addresses vulnerability to and coping with the impact of the disease has focused analysis principally at the household level. In a typical scenario, HIV and AIDS is understood to cause the sickness and ultimate death of one or more 'prime age" adults within a household, who are most likely to be parents and responsible for certain dependents. The immediate impact of this shock on the household is a reduction in labour availability and a drain on financial assets, as money is spent on medication and funeral expenses and wage labour is diverted to caring and subsistence. Coping mechanisms involving reallocation of labour, land and other assets have been identified.

Existing literature suggest that the impact of HIV and AIDS at household level is similar to that of other shocks to which poor rural households are vulnerable. Many of the coping strategies identified in the HIV and AIDS literature are similar to those which poor households are observed to resort to of crisis. (Chenn and Dunn, 1996). There is therefore no isolation of the particular impact of HIV and AIDS in the context of the range of different factors that affect households and communities. This research principally demonstrates that HIV and AIDS exacerbate existing problems of poverty. It is therefore problematic to use existing literature to guide practical interventions to mitigate the specific impact of HIV and AIDS.

Existing literature also only gives the qualitative impact of HIV and AIDS on food security, and does not quantify the vulnerability of the affected households. This also makes it problematic for effective policies and interventions to be implemented, as there is no quantitative measure of the type of interventions needed and the extent of these interventions. There is therefore need for quantifying vulnerability if effective interventions are to be implement.

As rising levels of prime –age mortality intensity existing patterns of chronic poverty and heighten the vulnerability of young people, it is increasingly recognized that this group has a crucial role to play in defining the future of societies affected by HIV and AIDS. Young people need to be offered livelihood options that meet their immediate needs .For example FAO recommends that extension services develop a formally structured youth programme in order to reach young people. Such a programme can help 'fill the void" caused by the loss of agricultural knowledge when productive –age community members die. Such an approach should facilitate the links and the transfer of knowledge between older members of society and their younger counterparts.

Since as already has been pointed out, agriculture only provides some options to young people, it will also be necessary to provide rural youth with the technical inputs and support necessary for them to pursue other livelihood strategies. Otherwise, as has been observed in many African countries, resource –scarce and disaffected youth will continue to turn to short –term, high risk solutions to meet their needs-strategies that are frequently unsustainable, and often increases the likelihood for the spread of HIV and AIDS.(Richards ,1999). There is therefore need for poverty alleviation programmes to ensure that the needs of future generations are met.

Given that some households and communities appear to be coping with the impact of HIV and AIDS, it is also important to analyze the ability to cope in more detail. Issues to be looked at are the factors that allow certain households to cope more effectively and the asset bases of such coping households

Executive Summary

Background

The Food Security Network (FOSENET) is a consortium of 24 Non Governmental Organizations (NGO) involved in food security work in Zimbabwe. The network has been responding to food security needs in the country through three distinct ways, i.e., food relief, monitoring of the food security situation and advocacy on food security issues in the country. By the very nature of its operations FOSENET is facing challenges in responding to the food security situation especially in the presence of the HIV and AIDS pandemic. FOSENET believes that household food insecurity in southern Africa cannot be properly understood if HIV and AIDS are not considered in programming. It is against this background that FOSENET sought to conduct a study to assess the impacts of HIV and AIDS on rural agricultural production and food security. The major objective of this study is to contribute to improved national policy formulation by availing Zimbabwe specific data regarding the impacts of HIV and AIDS on rural agricultural production and food security.

Methodology

The study used a statistical software known as SPSS for analysis. Development Data employed this software largely because of its flexibility in conducting different types of analyses. Development Data also used the Household Vulnerability Index (HVI) as the main framework for analyzing data from the two districts. The HVI categorize households according to their varying degrees of vulnerability and also assess whether HIV and AIDS had greater impact on household vulnerability compared to other shocks. In using the HVI for measuring household vulnerability, the study also adopted the Sustainable Livelihoods framework (SLF) by analyzing how households are affected by HIV and AIDS and their ability to cope with such shocks.

Findings

The analysis managed to show that there are generally high levels of household vulnerability to the impacts of HIV and AIDS in Makoni and Chivi districts regardless of whether the households are classified by the community based targeting system as directly or indirectly affected. There are no significant differences in the vulnerability of the two districts with both of them falling in the acute level category. The HVI showed that major contributing factors to vulnerability in the two districts are financial and social capital assets of household livelihoods. Households with no access to credit, rely less on bank savings as a source of income as well as those which are not receiving any form of support from NGOs and local community are more vulnerable to the impacts of HIV and AIDS.

Findings also showed that approximately 5.5% of households that are classified as directly affected by HIV and AIDS are less vulnerable and hence fall in the coping level category and 90.3% households are more vulnerable to the impacts of HIV and AIDS but classified as indirectly affected by the pandemic. In light of scarce resources available for the fight against HIV and AIDS, such a targeting system results in the wastage of resources.

Analysis to verify if HIV and AIDS were significantly affecting maize productivity per capita showed that HIV and AIDS factors, i.e., number of sick members and orphans within a household, emerge among the significant factors that explain differences in maize productivity per capita across households in the study areas. These results imply that households with AIDS-related sickness and orphans of HIV and AIDS are likely to have lower productivity compared to those without. Results also showed that factors that are highly significant in explaining variations in food diversity across households include presence of AIDS-related sickness and expenditures on food and farming inputs. Households that have sick household members are likely to be less food diversified especially due to the financial burden that sicknesses bring to household's financial resources.

Findings also showed that the majority of coping level households, i.e., approximately 70%, are adult male-headed households whilst the remainder are adult female headed households. More female headed households fall under the acute level of vulnerability compared to male headed households. All of the child and elderly headed households also fall under the acute level of vulnerability. These results serve to confirm that child and elderly headed households are marginally disadvantaged socio-economic groups within any society.

There is a general asset poverty in the studied communities especially livestock assets. Results show that acute level households have a high asset poverty compared to coping level households. Approximately 44.4% acute level households do not own any cattle compared to only 8.7% coping level households. For those households that own at least one cattle 34.8% of coping level households own more than 4 cattle compared to only 14.6% acute level households. These results show the extent of livestock assets poverty in acute level households.

HIV and AIDS are reducing the number of meals and the diversity of the food eaten by affected and vulnerable households. A higher percentage of coping level households (56.5%) have three meals per day compared to only 22.7% of acute level households. The majority of acute level households (72%) did have two meals. Results also showed that a higher percentage of acute level households had an average to low food diversity compared to the majority of coping level households that had an average to high food

diversity. Findings also established that the majority of households in the sample did not have any access to credit although it seems more acute level households compared to coping level household, did not have any access to credit. For households that had access to credit more female headed households were accessing credit compared to male headed households. Most households that were assessing credit are reported to have been part of a community or formal credit scheme.

Household expenditures in the study community are mostly on food and this is very common in acute level households where approximately 80% households spend most of their financial resources on food compared to 56.5% for coping level households. Investment in education and agriculture is quite minimal for acute level households compared to coping level households making these households more vulnerable to the impacts of HIV and AIDS. A closer look at acute level households revealed that more female headed households spend more on school fees and health expenses compared to the male headed households. Given an opportunity for additional financial resources households in the study communities indicated various new expenditures that they would want to engage in. Whilst a larger percentage of coping level households indicated that they would to increase their expenditure on farming inputs, savings and income generating projects respectively, most acute level household indicated that they would spend their additional income on food and farming inputs. This result gives an indication of the level of vulnerability in acute level households.

Households that receive support from any source which increase the immediate availability of food to the household are less vulnerable to the impacts of HIV and AIDS. Findings revealed that the majority of food support in the two districts is being rendered by NGOs. Households reported very little food support programmes coming from the government and the local community. Most coping level households are in NGO food support programmes. They also receive various other supports from the NGOs such as savings schemes, farm inputs, education and income generating projects. The majority of acute level households receive little support from NGOs but are members of various church groups where they get emotional and spiritual support.

Findings from the study also revealed mixed results when considering impacts of HIV and AIDS on natural capital. Whilst there was very little evidence of the impact of HIV and AIDS on land utilization, the pandemic seemed to impact on the use of forest products. Results indicated that coping level households were most vulnerable to the impacts of the pandemic as far as land utilization is concerned as more of these households failed to cultivate all of their land due to AIDS related sickness within their households compared to acute level households. Results also showed that more acute level households are resorting to the forest for survival through cutting down trees and selling of firewood compared to coping level households.

There was very little difference across gender dimensions and districts as far as strategies that households were employing to cope with food shortages. Most of the identified strategies were short term and bound to be detrimental to the households in the long run. Major strategies used by both coping and acute level households includes reliance on less expensive and preferred foods, borrowing from neighbors and friends, reducing number of meals per day, limiting portion size at meal times and harvesting immature crops. These strategies were employed by both coping and acute level households. There are other strategies employed by a smaller percentage of acute level households such as begging for food in the community and sending household members away to relatives

and friends so as to reduce household food requirements. These strategies were used by less than 4.5% of acute level households

Recommendations
Some of the major recommendations emanating from this study are highlighted below:

Observation 1: *Makoni and Chivi district have average vulnerabilities that fall under the acute level of household vulnerability.*

Recommendation 1: With rapid social protection responses acute level households can be resuscitated. These social protection responses should be informed by vulnerability analysis of the two districts. Basically since the study has managed to single out major sources of vulnerability, these should then inform intervention programmes meant to reduce the vulnerability of the two districts to the impacts of HIV and AIDS.

Observation 2: *Community Based Targeting system for identifying household that are directly affected by HIV and AIDS is targeting some households that are less vulnerable and hence should not be targeted and also excluding some households that are very vulnerable to the impacts of HIV and AIDS.*

Recommendation 2: There is a need to come up with a targeting mechanism that reduces inclusion errors as this will improve the use resources. Certainly an inclusion error of less than 1% is desirable. Community based targeting need to go under a verification process with some other independent system to check for inclusion errors.

Observation 3: *Household vulnerability is emanating from two major sources, i.e., financial and social capital assets of household livelihoods.*

Recommendation 3: Programmes need to be put in place to strengthen the financial assets of affected households and thus reduce the economic burden resulting from impacts of HIV and AIDS. There is an opportunity to scale up existing community and formal credit scheme projects as these have already proven to be an effective way of increasing financial resources to member households. Programmes should also be designed to strengthen the social fabric within communities and built upon community relationships and thus improving the existing social support networks. Certainly there is a room to extent the role that is being played by churches in the different communities to also include intervention programmes targeted at vulnerable groups of the society. This might involve capacity building of the churches so that they could organize and prepare themselves to be partners in the implementation of development programmes. Already there exist some models that can offer learning experiences such as the Diocese of Mutare Community Care Programme being implemented in some parts of Manicaland province.

Observation 4: *HIV and AIDS are two of the many factors that affect maize productivity and food diversity within the studied communities.*

Recommendation 4: It is not possible to consider HIV and AIDS in isolation from other socio economic phenomena that affects agricultural production and food security in rural households. On the other hand it is detrimental for any development processes to ignore the effects of HIV and AIDS considering them as negligible. Efforts should be made to come up with wholistic approaches to food security that integrates all the

different factors affecting agricultural production and food security. This will ensure chances of successful and sustainable intervention programmes.

Observation 5: *All child and elderly headed households fall under the acute level of vulnerability*

Recommendation 5: Social protection policies that focus on these disadvantaged groups of the society need to be crafted so as to assist them fight both their internal and external vulnerability. Female headed households should also be considered as a disadvantaged group in the society. There is need to sensitize any development programme to consider how it will contribute to the livelihoods of the disadvantaged groups of the society.

Observation 6: *Most acute level households indicated that they would use any additional income to buy food*

Recommendation 6: This observation is important especially when considering new intervention programmes targeted for the study communities. Any efforts to assist households reduce their food insecurity in Makoni and Chivi districts, which do not address the immediate food requirements of these communities is likely to register very little success. Immediate household food requirements take precedence over any other activity that might improve household's food security in the long run. Efforts should be made to ensure that programmes that address household food requirements in the two districts are put in place.

Observation 7: *The study design was cross sectional in nature thus making it virtually impossible to compare differences across time***.**

Recommendation 7: Resources permitting, it will be interesting to redo the same survey in three or four years to come so as to establish time series data and a basis for comparison. This will make it possible to siphon out impacts that attributable to HIV and AIDS in a better way.

Chapter 1: Introduction

1.1 Background to the study

The Food Security Network (FOSENET) is a consortium of 24 Non Governmental Organizations (NGO) involved in food security work in Zimbabwe. The network has been responding to food security needs in the country through three distinct ways, i.e., food relief, monitoring of the food security situation and advocacy on food security issues in the country. By the very nature of its operations FOSENET is facing challenges in responding to the food security situation especially in the presence of the HIV and AIDS pandemic. FOSENET believes that household food insecurity in southern Africa cannot be properly understood if HIV and AIDS are not considered in programming. Though the HIV and AIDS pandemic is a global concern, it is in Africa where the effects of the pandemic are mostly felt. Approximately 70% of global HIV infections are located in Africa, where 28.5 million people live with HIV and AIDS (UNAIDS 2000). Southern African sub region bears a disproportionate burden of HIV and AIDS cases and until recently Zimbabwe was among the countries with the highest HIV adult prevalence rates in the region. Although current statistics released by the Ministry of Health and Child Welfare indicate an adult prevalence rate of approximately 18%, this figure is still high compared to other countries in Africa and world over. It is against this background that FOSENET sought to conduct a study to assess the impacts of HIV and AIDS on rural agricultural production and food security. The major objective of the study is *to contribute to improved national policy formulation by availing Zimbabwe specific data regarding the impacts of HIV and AIDS on rural agricultural production and food security*. Specific objectives of the study include among others:

- To shed light on the different degrees and levels of household vulnerability introduced by HIV and AIDS on household agriculture and food security;
- To give a gender dimension of the impacts of HIV and AIDS on food security in 2 districts of Zimbabwe;
- Document the impacts of HIV and AIDS on affected households[1] with respect to access to farm resources.
- Assess any changes in expenditure patterns of the affected households due to HIV and AIDS;
- Document any coping strategies of the HIV and AIDS affected households with food insecurity;
- To recommend effective strategies to both the government and humanitarian sector for rendering sustainable assistance to HIV and AIDS affected households

In conducting this study FOSENET is aware of a number of other HIV and AIDS impact studies that have been undertaken in and around Africa over the last decade. FOSENET is also aware of challenges that these studies faced in trying to isolate the impacts of HIV and/or AIDS from the broader spectrum of other vulnerability shocks such as poverty and drought. Past research work has been very successful in qualitatively showing the impacts of the pandemic on agriculture and food security such as the loss of

[1] For the purposes of this study, HIV and AIDS directly affected households have been defined as those households that:
a) Are currently living with one or more adults with HIV and AIDS
b) Have experienced a recent death(s) from AIDS
c) Have taken in one or more orphans from a family that experienced an AIDS related death.

adult labour, changing household structures and the increase in non productive expenditures that draw resources away from productive endeavors. The general consensus emanating from past studies is that HIV and AIDS exposes affected households to both the risk of losing productive assets; labour and wage income, and also the ability of these households to cope (Robinson and White, 2000). However, these studies did very little to try and put a quantitative measure to household vulnerability, which FOSENET believes is pivotal if effective interventions are to be implemented. According to Thomas (2003), to be able to address vulnerability, we should be able to measure it, so that we can identify areas of highest priority. Although HIV and AIDS make affected households vulnerable to poverty, the extent of vulnerability varies amongst households depending on such issues as the ownership of assets. This therefore means that different households affected by HIV and AIDS might require different types of support for them to recover and be resilient to the impacts of the pandemic. Therefore FOSENET sought to use the Household Vulnerability Index (HVI) developed by the Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) to try and quantify household vulnerability to HIV and AIDS impacts in Chivi and Makoni rural districts.

1.2 Terms of Reference

Under this contract Development Data was to provide training services to FOSENET research assistants on the use of the HVI and also conduct data entry and analysis for FOSENET after the fieldwork survey and provide the quantitative analysis thereof. Based on the findings Development Data would produce a report on the quantitative impacts of HIV and AIDS on food security using field data and the HVI.

1.3 Methodology

In conducting this assignment Development Data participated in a two day training workshop held for FOSENET research assistants. In this workshop a presentation on the HVI and its applicability were made to the research assistants. Development Data also participated in the pilot testing of the tool that was used to collect data for this survey.

Data was entered into a Statistical Package for Social Scientists (SPSS) spreadsheet for analysis. Development Data employed the SPSS software on the client's request and also because of its flexibility in conducting different types of analyses. The study used the Household Vulnerability Index (HVI) to analyze data from the two districts, so as to categorize households according to their varying degrees of vulnerability and also assess whether HIV and AIDS had greater impact on household vulnerability compared to other shocks. In using the HVI for measuring household vulnerability, the study also adopted the Sustainable Livelihoods framework (SLF) by analyzing how households are affected by HIV and AIDS and their ability to cope with such shocks.

1.4 Organization of the report

The report is basically organized into four chapters. The first chapter outlined above provides a brief background to the study and its objectives, terms of reference and the methodology that was used in conducting the assignment. Chapter two gives a background to the HVI. It highlights the theoretical foundations of the model, indicators used, assumptions, setting of the different weights in the computation and limitations to the model. The third chapter provides quantitative research findings whilst the fifth and final chapter gives the conclusions and recommendations emanating from the study.

Chapter 2: Household Vulnerability Index

2.1 Background to the HVI

The HVI concept was conceived during a 2004 FANRPAN study on the *Impacts of HIV and AIDS on Rural Livelihoods and Food Security*. Through the impact study, conducted in 7 SADC countries, FANRPAN identified the need to put a quantitative measure to household vulnerability in the presence of HIV and AIDS as pivotal to effective intervention in the HIV and AIDS crisis. Conceptually, a household with better material wealth should be better equipped to cope with HIV and AIDS, yet the level of copying depends on the quantity and quality of such wealth, knowledge about the disease; and other complex societal variables. This led to the development of the HVI. The HVI was developed by investigating the different dimensions through which households are prone to impacts, applying appropriate weights and scales to each of the impact areas and deriving a household index. Only two countries, i.e., Lesotho and Swaziland were able to apply the HVI framework in advanced analysis of their data. The results of this advanced analysis are contained in a FANRPAN 2007 regional book publication known as the *Silent Hunger*. The HVI approach was then further field tested in three SADC countries, i.e., Lesotho, Swaziland and Zimbabwe so as to refine the model and come up with a universal approach of applying the framework in HIV and AIDS impact studies.

The HVI framework employs the SLF as the basis of its foundation. The SLF stipulates that a livelihood is sustainable when a household can cope with and recover from stresses and shocks; maintain or enhance its capabilities and assets, while not undermining the natural resource base. Thus the more assets a household has, the lesser its vulnerability. A household livelihood generally has five assets, i.e. human, physical, financial, social and natural capitals. Household vulnerability evolves from the impact of HIV and AIDS impacts on one or all of these assets as follows:

- *Human capital*- HIV and AIDS impacts on household demographic structure i.e., size and composition, and the mobility of household members.
- *Natural capital*- Household vulnerability increases environmental degradation and affects access to natural capital.
- *Physical capital*- This includes changes in household physical assets, access to extension services and changes in optimal farm household production.
- *Financial capital*- HIV and AIDS evoke changes in household financial assets, investment choices, household income and expenditure and market access.
- *Social capital*- The pandemic affects social networks in terms of support, and inter and intra-relationships from government, community and other relatives.

By focusing on the five livelihood assets within any given household, the HVI sheds new light on the degrees and levels of household vulnerability introduced by the HIV and AIDS pandemic on household agriculture and food security. Through this approach, households are categorized into three levels of vulnerability, i.e., copying, acute and emergency and then based on these levels development response packages are designed to assist the most vulnerable households fight their external and internal vulnerability. Data collected for the HVI is also a usable indicator for monitoring how assisted households graduate or deteriorate from one level of vulnerability to another. The use of

the HVI allows for the tracing of origins of vulnerability thereby shedding light on the package of responses required to move households from one level of vulnerability to another. The HVI also provides a tool that can be used by programming and implementing partners to efficiently monitor the effectiveness of their intervention programmes. The HVI also provides a way for the quantitative mainstreaming of the impact of HIV and AIDS in vulnerability assessments.

2.2 Theoretical Foundation of the HVI

The theoretical foundation of the HVI takes on from the work originally proposed by Costa (2002) known as the **fussy set approach** to multidimensional analysis of poverty given composite indicators. The quest for the exercise, as was the case in the work by Costa, is to quantify the multi-dimension aspects of the impacts of a health problem on a household. Our specific quest is to assess at the household level, the impact of HIV and AIDS on food security. The Fussy Set approach was used to analyze the data. The following definitions help clarify how the approach was used:

- One can state that for the population N made up of n households i.e. (N={hh_1, hh_2, hh_3 …hh_n}, V is a subset of v households that have some degree of vulnerability to HIV and AIDS- hence impacted by the epidemic. Thus $v \leq n$ and $v=0$ implies that there are no vulnerable households, and $v=n$ implies that all households are vulnerable.
- One can also break down the vulnerability X into m specific dimensions of impact, and give a corresponding weight (w_i , $i=1,\ldots,m$)to each dimension. The weights can be predetermined, or developed using an appropriate function.
- The vulnerability of any given household hh_i $i=1\ldots n$ to the jth $j=1,\ldots m$ dimension of impact can be expressed as X_{ij}, and set to take values between 0 and 1 such that 0=no impact and 1 full impact. A specific formula for calculating X_{ij} is discussed later. Thus each X_{ij} denotes the degree of vulnerability of household i to the jth dimension of impact, and $X_{ij}w_i$ will be the corresponding weighted vulnerability.
- The sum of the weighted vulnerabilities across all dimensions will give the particular household's total vulnerability Vhh_i to HIV and AIDS, that is:

  $$\sum_{j=1}^{m} X_{wj} / \sum_{j=1}^{m} w_j = Vhh_i$$

- It is also possible to sum down the dimensions and calculate the particular dimension's contribution to vulnerability to HIV and AIDS.
- For the study, the sum of the weights has been conveniently set to $\sum_{j=1}^{m} w_j = 100$. The weights were preset as discussed below.

The Household vulnerability index was calculated by applying the theory discussed above to the data collected by household questionnaires, observing a number of steps as shown in Appendix 2.

2.3 HVI Indicators

Fifteen impact areas that fall within different livelihood assets or dimensions were identified through the 2004 FANRPAN study. These provide the hypothesis mentioned in Table A3 in Appendix 2 that are tested in the HVI framework. Two or three indicators were also identified under each impact area to test the derived hypotheses.

Impact areas and variables to be used to measure household vulnerability

	Impact areas	Indicators
1	Optimal farm-household production decisions	Nitrogen fertilizer use for staple crop Staple cereal output per capita
2	Changes in household demographic structure and labour availability	Proportion of sick members Who is regularly sick Dependency ratio
3	Changes in household productive physical capital assets	Ownership of plough or ox-drawn cart Productive livestock index Livestock sales index
4	Sustainability of household food and nutrition security *(food accessibility and utilization)*	Number of meals per day Regular source of financial resources Household nutrition diversity
5	Impact on household Market Access	Use of revenue from crop sales
6	Agricultural extension services	Access to extension services
7	Changes in household income and expenditure patterns	Expenditure patterns Expenditure of additional resources
8	Changes in household productive financial capital assets	Reliance on bank savings Amount of credits received Presence of unpaid debt
9	Impact on household investment choices	Farm equipment purchases and sales Livestock purchases and sales
10	Access to behavioral change information	Sources and quality of information on HIV and AIDS Sources and quality of information on agriculture
11	Changes in household productive natural capital assets	Loss of land % land utilization
12	Mobility of household members	Household disintegration due to HIV and AIDS
13	Gender implications	Age and gender of household head
14	Support networks	Two types of support from government, NGOs and local community Areas in which support completely met household requirements Number of social networks
15	Environmental degradation	% field fertilized by natural means Management and use of forest products

2.4 Setting HVI Dimension Weights

The weights or scores for each of the five HVI dimensions are predetermined in each particular study depending on the livelihood strategies of the study communities. The weights are preset after taking into consideration the importance of each livelihood asset in the lives of the target community. For example a community that is well networked to a number of markets and that is actively participating in those markets would put more weight on their financial capital compared to natural capital. On the other hand a community that is near a rich forest and survives mainly from harvesting that forest would also put more weight on the natural capital asset. So the contribution of the

particular livelihood asset to the community's way of life is of importance in presetting the weights.

For the purposes of this survey, weights for the different HVI dimensions are the same in the 2 districts. This is because after studying the two districts, it was found out that people in the two districts have more or less similar livelihoods. Most people in Chivi district depend on subsistence farming (human capital dimension), remittances from family members and buying and selling of goods (financial capital dimension). In Makoni district, most people also survive on subsistence farming (human capital and crop sales (financial capital).

2.5 HVI Categories of Vulnerability

Three levels of vulnerability were used in the survey. Household could either fall into vulnerability level 1, 2 or three. Specific definitions for these categories are given below:

- Vulnerability level 1 = Coping level households – a household in a vulnerable situation but still able to cope.

- Vulnerable level 2 = Acute level households – a household that has been hit so hard that it badly needs assistance to the degree of an acute health care

- Vulnerability level 3 = Emergency level households – a household at a situation equivalent to an intensive care situation – almost a point of no return – but could be resuscitated only with the best possible expertise

The study used the conventional cut off point used in the HVI for categorizing households in any of the three levels of vulnerability. The HVI model states that households are considered:

- Coping level households if HVI > 0.33
- Acute level households if HVI is greater than or equal to 0.33 and less than or equal to 0.66
- Emergency level households if HVI is greater than 0.66

The above cut-off points were derived through a simulation process. The study simulated a coping level household by assigning upper limits of coping level values to the different indicators and the calculating the HVI. This was used as the cut-off point for coping level households. The process was repeated for the acute level household and emergency level households.

2.6 Limitations to the HVI

There are basically two major limitations in applying the HVI to HIV and AIDS impact studies. Despite the fact that the HVI derivation was largely informed by a rich literature around HIV and AIDS in the world, the index is not immune to challenges that bedevil indices. An element of subjectivity especially in the assigning of weights to the different livelihood assets remain one of the major challenges. Though this process is supposed to be informed by a careful analysis of literature on the study communities, there are bound to be limitations if this literature scan is not conducted properly.

The HVI is a household vulnerability index. Household vulnerability can emanate from different stressors or shocks within a household and HIV and AIDS is just one of them.

The model does very little to differentiate the impacts of HIV and AIDS from that of others vulnerability shocks. This means that the model can only be applicable in HIV and AIDS impact studies if there already exist an efficient system of identifying HIV and AIDS affected households from the general populace of households. Hence much emphasis must be put on the sampling method so as to ensure that affected and less or indirectly affected households are correctly identified.

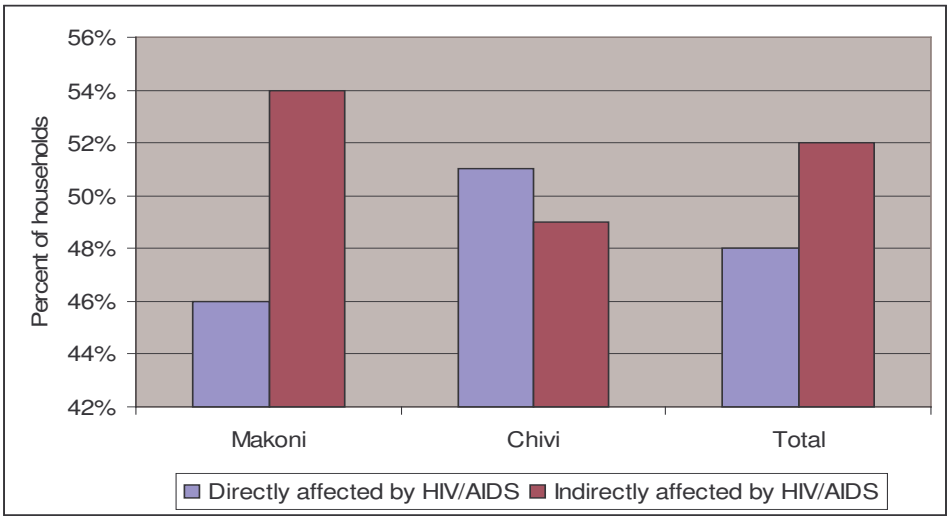
Chapter 3: Research Findings

3.1 Characterization of Households

3.3.1 Characterization of directly affected and indirectly affected families by district

A total of 300 households were sampled and interviewed for the study. Approximately 48% of the households in the sample are characterized as directly affected by HIV and AIDS, while 52% of the households are indirectly affected by the pandemic (Fig 1). As pointed out in earlier sections of this report households were deemed directly affected by the pandemic if they had any of the following, i.e., HIV and AIDS orphans, household member/s who have HIV and AIDS related sickness and suffered HIV and AIDS related deaths.

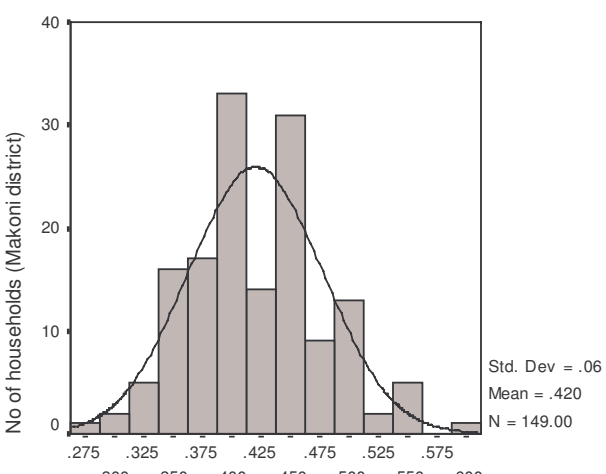
Fig 1: Distribution of directly affected and indirectly affected families by district

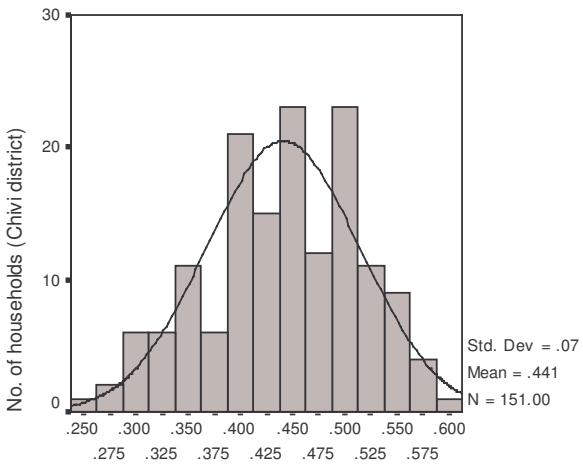


In Chivi almost equal representations of households were sampled where 51% of the households are directly affected while 49% are indirectly affected by HIV and AIDS. In Makoni only 46% of the households sampled are directly affected while 54% of the households are indirectly affected

3.1.2 Household Vulnerability Characterization

There are generally high levels of household vulnerability to the impacts of HIV and AIDS in Makoni and Chivi districts. Fig 2 show variability in HVIs in the two districts. Households in Makoni district have an average HVI of 0.42 and whilst those in Chivi have an average HVI of 0.44. Though these results could imply that Chivi district is





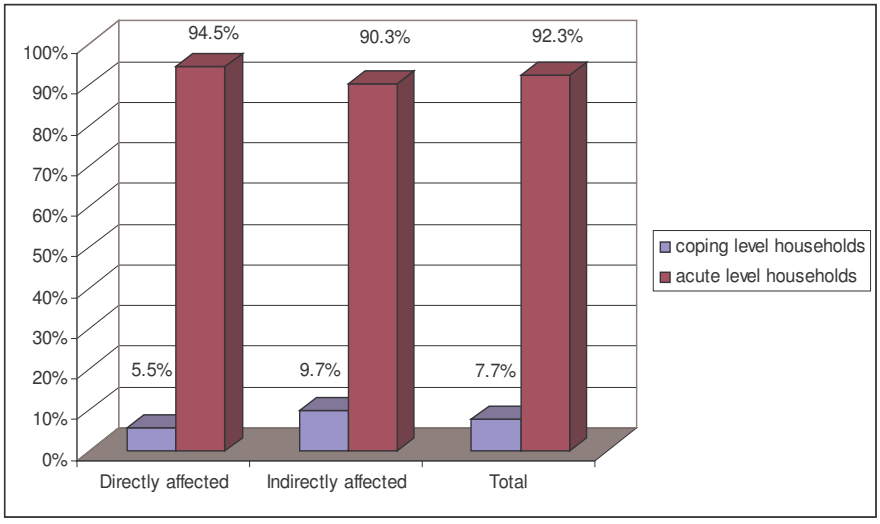
It is important to also note that there is no significant difference between Makoni and Chivi district in terms of their vulnerability levels. Only a few households in the two districts can be classified as coping level household. Results indicate that 5.4% and 9.9% of households in Makoni and Chivi districts can be classified as coping level households whilst 94.6% and 90.1% of households in the respective districts are classified as acute level households. These results guides the remaining section of the discussion of findings where much emphasis will be on comparison between different vulnerability groups and gender dimensions.

3.1.3 Community Based Targeting versus HVI

Comparing Community Based Targeting (CBT) with the HVI which is an index that quantifies household vulnerability to the impacts of a vulnerability shock such as HIV and AIDS, drought, etc, gives a better understanding of the characteristics of the different households in the sampled population and the effectiveness of the targeting mechanisms used in study areas. In this context the HVI was applied to assess vulnerability of sampled households to the impacts of HIV and AIDS. The model assesses vulnerability emanating from all the livelihoods aspects of a given household.

Generally over 90% of households in the sample fall in the acute level of vulnerability regardless of whether they are directly or indirectly affected (Fig 3). This signifies high levels of vulnerability within the study communities. Results also show that approximately 5.5% of households that are classified as directly affected by HIV and AIDS are less vulnerable and hence fall in the coping level category. On the contrary they are 90.3% households that are more vulnerable to the impacts of HIV and AIDS that are classified as indirectly affected by HIV and AIDS. This shows that there is a need to revisit the targeting mechanism in the study communities so as to come up with an efficient targeting system that enhance the effectiveness of impact mitigation programmes. The challenge is to come up with a targeting mechanism that reduces inclusion errors as this will improve the use resources.

Fig 3 Community Based Targeting versus HVI



3.2 Extent to which HIV and AIDS affect agriculture and food security

One major question this research sought to answer is whether HIV and AIDS are really impacting negatively on agriculture and food security, or they are just some of the factors leading to vulnerability in rural households. FOSENET thus realizes the importance of verifying the above assumption early in the analysis in order to make informed conclusions. Multivariate regression analysis was used for this purpose. The tool was found suitable for this type of analysis because of its ability to provide three useful pieces of information that can be used to verify the assumption that HIV and AIDS are indeed affecting the sampled households. Multivariate regression analysis provides the following information:

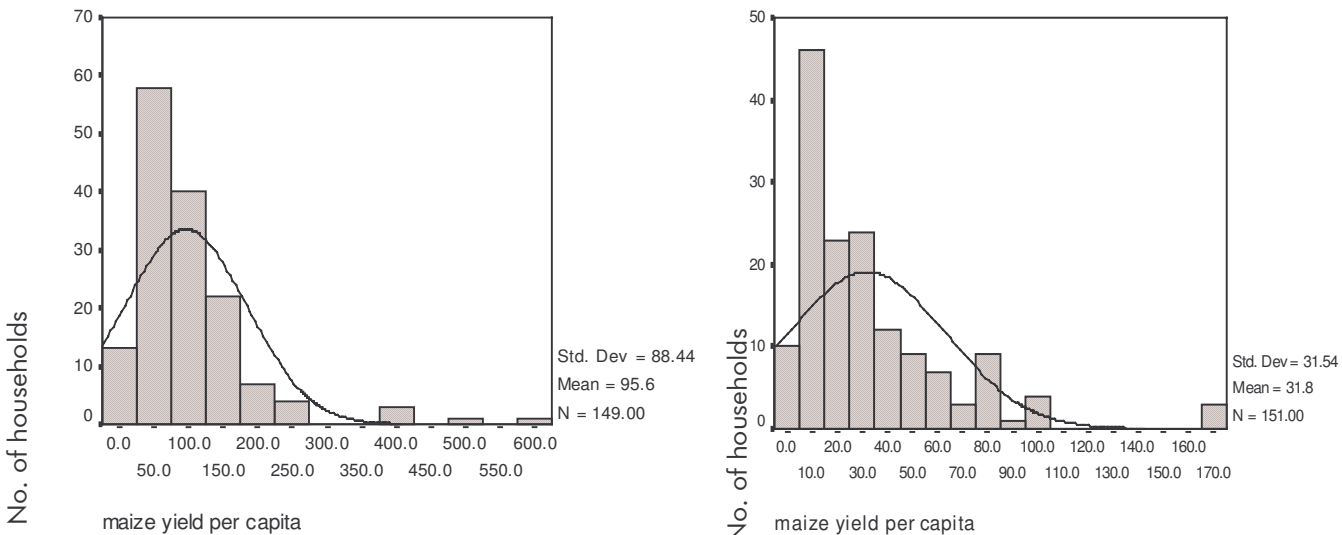
- degree to which an independent variable affects the dependent variable
- direction of causality
- significance of the effect that the independent variable has on the dependent variable

Two regression models were constructed and two indicators of agricultural production and food security were used as dependent variables. These are maize productivity and food diversity. The number of HIV and AIDS orphans, presence of HIV and AIDS related sickness and deaths were used as proxies for HIV and AIDS in the models. Results are presented below. Maize productivity in the regression model is defined as returns to land put under maize production and food diversity as household access to a specified list of foods in a given time period.

3.2.1 Maize Productivity

In most rural communities of Zimbabwe maize production is a major source of food. Approximately 98.7% and 99.3% of sampled households cultivated maize in the 2006/2007 agricultural season in Makoni and Chivi districts respectively, showing that the communities mainly depend on maize production for survival. This shows the importance of maize as a food crop in the study communities and hence its use as one of the indicators of food security in this study. The implications of the above results are that if HIV and AIDS are affecting the sampled households, the effects will be reflected in maize productivity of the different households. It is important to determine the different factors affecting variability of maize production across households and in the process verify if any of the proxies of HIV and AIDS used in this study are significantly affecting production.

Fig 4 shows variability in maize yields across households in the two districts. Although per capita maize production in both districts is low, Chivi districts is worse off with an average per capita yield production of 31.8kgs compared to 95.6kgs realized in Makoni



Results from the analysis (Table 1 below) show that HIV and AIDS factors included in the model, i.e. number of sick members and orphans within a household, emerge among the significant factors that explain differences in maize productivity per capita across households in the study areas. These factors appear to be negatively affecting maize yield in the two districts. This means that households that are directly affected by HIV and AIDS households i.e. those with AIDS-related sickness and orphans of HIV and AIDS are likely to have lower productivity compared to indirectly affected households.

There are however other factors that also significantly affect maize yields across the sampled households. These include geographical area, age of household head, ownership of farm implements such as a plough and livestock assets particularly cattle, access to extension services and the number of economically active members within a household. Some of these factors are correlated to the presence of HIV and AIDS in a household. Literature around HIV and AIDS show that the presence of AIDS-related sickness and orphans in a household affects the demographic structure of households, assets within a household, access to extension services and the availability of productive labour. This has a negative impact on maize production.

Table 1: Factors Affecting Variability in Maize Productivity

Dependent variable: Log of Maize yield per capita(kg/ha)	
Independent variables	**Parameter estimates**
(Constant)	7.700
District	-0.455**
Status of household	-0.020
Age of household head	-0.097*
Highest level of education of head	-0.053
Number of sick members	**-0.163****
No. economically active members	0.152**
Number of orphans	**-0.039****
Log of dependency ratio	-0.114
Ownership of ox plough	0.155**
Log of livestock index	0.171**
Area under maize	-0.354**
Access to extension	0.101*
R	**0.72**
R Square	**0.52**
Adjusted R Squared	**0.49**

** Significant at 10%** significant at 5% *** significant at 1%*

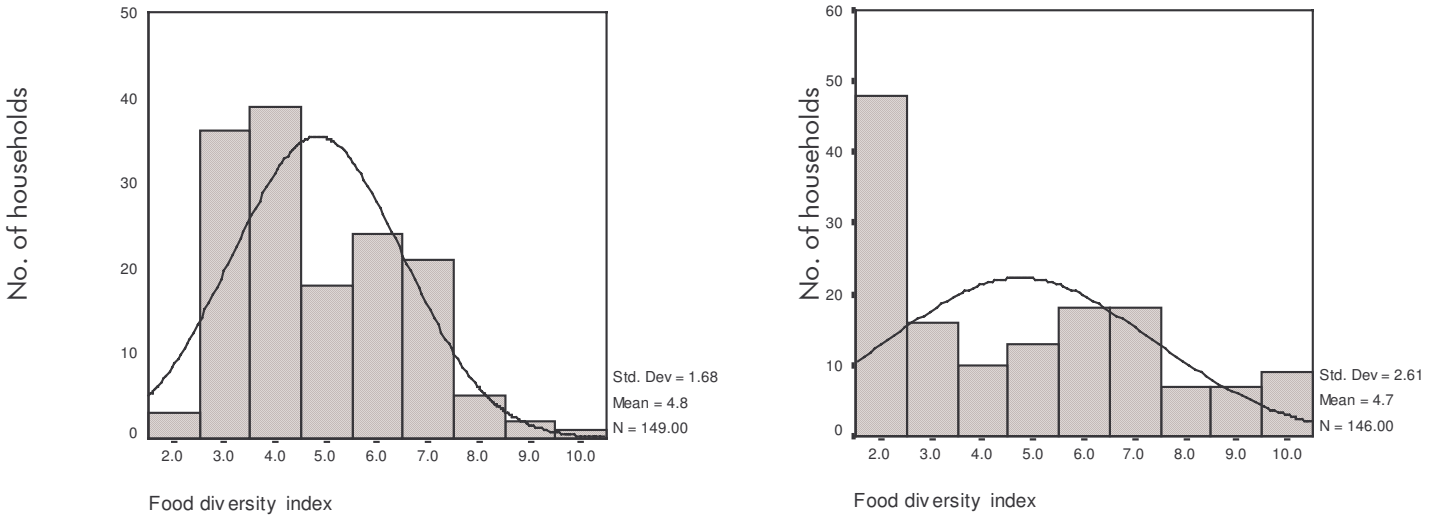
3.2.2 Food Diversity

Availability of food within a household is one of the indicators of food security. More so the diversity of that food affects the nutritional status of that household and hence its well being. Food diversity index measures a given household's access to different food requirements over a specific period. The more diversified a household is the less its vulnerability to food insecurity. In the survey different types of foods consumed by households over a one week period before the survey were regrouped into 9 different food groups:

- Food group 1: Grains
- Food group 2: Dairy
- Food group 3: Sugars
- Food group 4: Oils
- Food group 5: Vitamin C Vegetables
- Food group 6: Tubers
- Food group 7: Meat, Eggs, Fish
- Food group 8: Vitamin A Vegetables
- Food group 9: Fruits

The index was then computed by aggregating the scores for each household. A score of 9 signifies high food diversity and a score of 1 indicate low food diversity. Results from the study show that the directly affected households had a lower food diversity index of 4 as compared to the indirectly affected households with a recorded average of 5. A marked variation in the food diversity across all sampled households is realized in both districts. Households in Makoni and Chivi districts (see Fig 5 below) are generally less diversified in terms of the food they eat. Results in Fig 5 show that more than 50% of households in both districts have a food diversity index of less than 5.

Fig 5: Variability in Food diversity across households in Makoni and Chivi districts



a) Makoni district **b) Chivi district**

The food diversity of a household is determined by a number of factors as illustrated in Table 2 below.

Factors that are highly significant in explaining variations in food diversity across households include presence of AIDS-related sickness and expenditures on food and farming inputs. Households that have sick household members are likely to be less food diversified especially due to the financial burden that sicknesses bring to household's financial resources. As the contribution of agricultural activities to food security in the

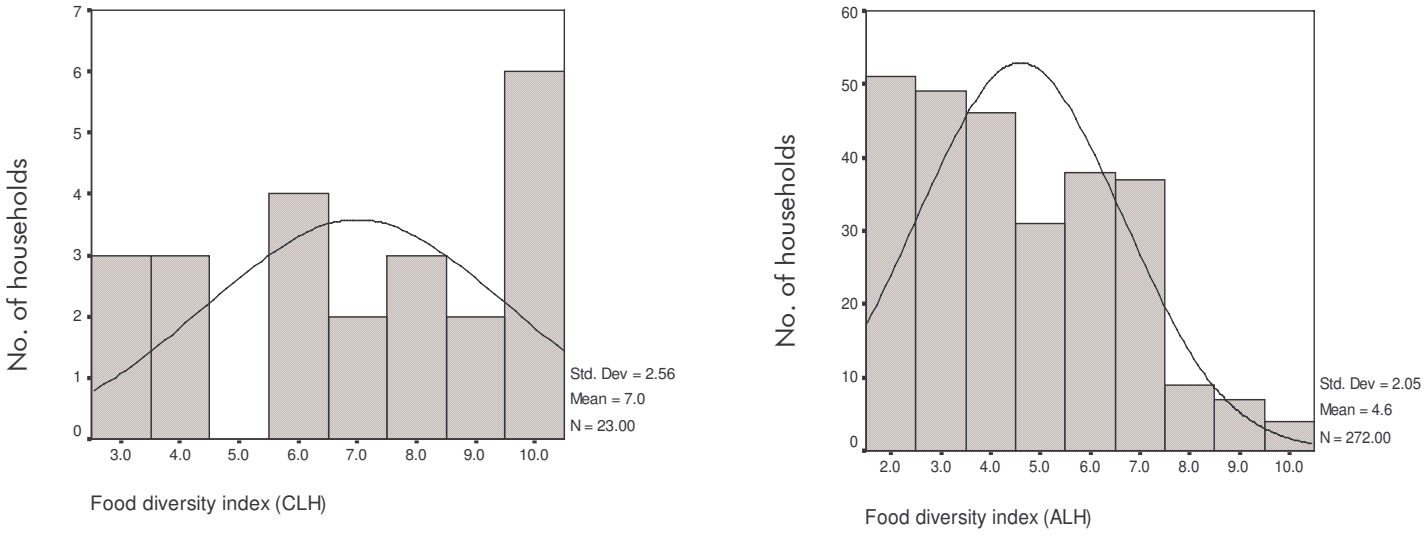
study areas is low owing to drought, unavailability and unaffordability of farming inputs, households rely mostly on the market for food. Hence households that spend more on food and farming inputs are more diversified in terms of their diet. Though not significant, having more orphans in household and also incurring health expenditures negatively impacts the diversity of food within a household. These results show that HIV and AIDS are having an impact on food availability and diversity within sampled households through its impact on expenditures on food, financial resources due to increased number of orphans and loss of income and labour by incapacitating productive members of households.

Table 2: Factors Affecting Variability in Food Diversity

Dependent Variable: Log of Food diversity index	
Independent variables	**Parameter estimates**
(Constant)	0.49
District	0.04
Highest level of education of head	0.32***
Number of orphans in the household	-0.02
Expenditure on food	0.28***
Expenditure on health expenses	-0.11
Expenditure on farming inputs	0.46***
log of dependency ratio	-0.08
log of livestock index	0.17*
log of number of sick members	**-0.23****
R	**0.62**
R Square	**0.38**
Adjusted R Square	**0.31**

** significant at 10%** significant at 5% *** significant at 1%*

Fig 6: Variability in food diversity across households of different vulnerability levels



Results in Fig 6 above show differences in food diversity among households of different vulnerability levels. Generally coping level households are highly food diversified with an average food diversity index of 7 compared to acute level households that have an average food diversity index of 4.6. From the above analysis, it can therefore be concluded that HIV and AIDS are impacting on agriculture and food security although it is difficult to really separate their impact from that of other shocks such as poverty. These results are further explored in section 3.5. By definition coping level households are those households that are vulnerable but still have the resilience to cope with or withstand the impacts of HIV and AIDS. Such households perform better in most of their livelihood areas compared to acute level households. The following sections of the report will explore the differences in coping and acute level households in terms of their livelihoods.

3.3 Impact of HIV and AIDS on the household human capital base

3.3.1 Distribution of household heads in the sample population

The household head is the pillar of rural households. The food security situation of a rural household greatly depends on the gender and age of the household head. Literature highlights that the differences between a female and male-headed household are evident in their livelihoods. Child and elderly headed households are perceived to be the most vulnerable to the impacts of HIV and AIDS. Approximately 46% of the sampled population are male-headed households whilst 45% are female-headed households. Child headed households constitute 5.4 % of the sample whilst households headed by the elderly constitute 3.3% of the sample. Makoni district has more female-headed households (52%) compared to Chivi district with 39%. On the other hand Chivi district has a higher percentage of child and elderly headed households i.e., 6.7% and 6% respectively, compared to Makoni district that has 4% and 0.7% respectively.

Fig 7: Distribution of household heads by level of vulnerability

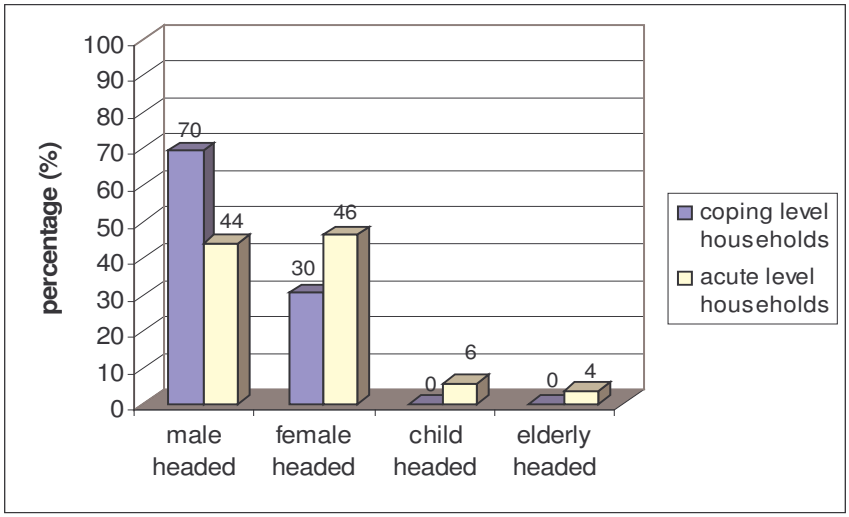


Fig 7 explores differences in household heads for households falling under different categories of vulnerability. Results show that the majority of coping level households, i.e., approximately 70%, are adult male-headed households whilst the remainder are adult female headed households. None of the child and elderly headed households fall under

the coping level category. On the contrary 46% of acute level households are adult female headed households whilst 44% are adult male headed households. Approximately 6% and 4% of acute level households are child and elderly headed households respectively. These results serve to confirm that child and elderly headed households constitute the bulk of marginally disadvantaged socio-economic groups within any society.

3.3.2 Comparing other household demographic characteristics

In analyzing the impact of HIV and AIDS on the human capital base, this study looked at the dependency ratio, the number of sick members and the incidents of death in a household as these represent an economic burden. The dependency ratio in particular may be taken to represent the different economic commitments arising from having to take care of dependent members of a household. This has implications on the availability of food and hence vulnerability of a household to food insecurity. The presence of sick members in a household may negatively affect financial resources available to the household as a result of additional medical expenses, hence affecting the food security status of the household. Deaths are usually associated with sale of productive physical assets such as livestock as well as loss of remittances if the deceased member was the breadwinner of the household. Results in Table 3 show that acute level households have a higher dependency ratio and incidence of deaths. They also have more members that are sick compared to coping level households.

Table 3: Demographic characteristics

	Coping Level Households (n=23)	**Acute Level Households (n=277)**
Mean dependency ratio	0.43	0.55
Mean number of sick members	0.4	0.6
Mean number of deaths	0.48	0.49

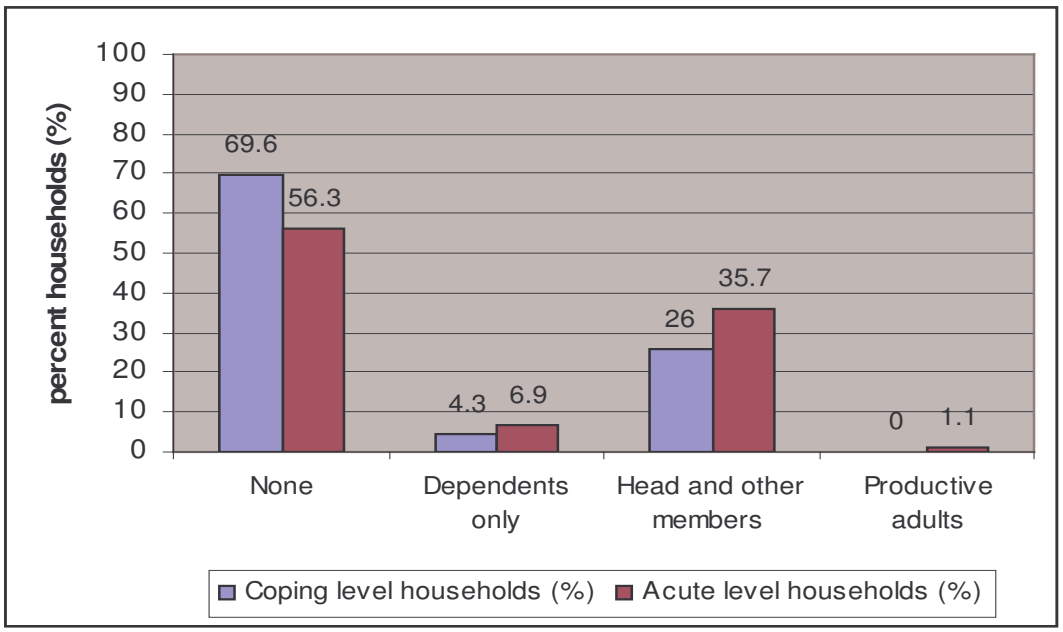
Results also show that female headed households have a higher dependency ratio compared to male headed households regardless of their level of vulnerability (Table 4). For acute level households, female headed households also have a higher average number of sick members in their households (0.62) compared to male headed households (0.55). Thus female headed households in the study communities have a higher economic burden compared to male headed households and thus are more prone to the impacts of HIV and AIDS compared to their male counterparts.

Table 4: Comparing demographic characteristics across different gender dimensions

		Coping Level		**Acute Level**	
	Gender	**n**	**Mean**	**n**	**Mean**
Sick members	male	15	0.47	133	0.55
	female	8	0.25	144	**0.62**
Dependency ratio	male	15	0.41	133	0.50
	female	8	**0.47**	144	**0.59**

It is of particular interest to this study to establish the number of regularly sick members within a given households and go further to establish the particular person who is regularly sick within each household. Incapacitation of the household head is likely to have a greater impact on the household compared to that of other household members although this is dependent on the severity of sickness of other household members. Definitely the sickness of a child takes away productive labour time from the household and could come with hefty medical costs on the household that reduces on food and farm input expenditures. Fig 8 shows that 35.7% of acute level households have the head and other members of the households as sick persons compared to 26% for coping level households. Generally more acute level households (43.7%) have at least one household member being regularly sick compared to coping level households (30.4%)

Fig 8: Regular sick persons in different vulnerable groups



Among coping level households, a higher percentage of male headed households have at least one household member who is sick compared to female headed households. This is not the case with acute level households. Approximately 47.2% of female headed households in the acute level category have at least one sick household member compared to 39.8% for male headed households. This means that the burden of the presence of sickness is felt more in female headed households compared to male headed households. These results are shown in Table 5.

Table 5: Regular sick members across different gender dimensions

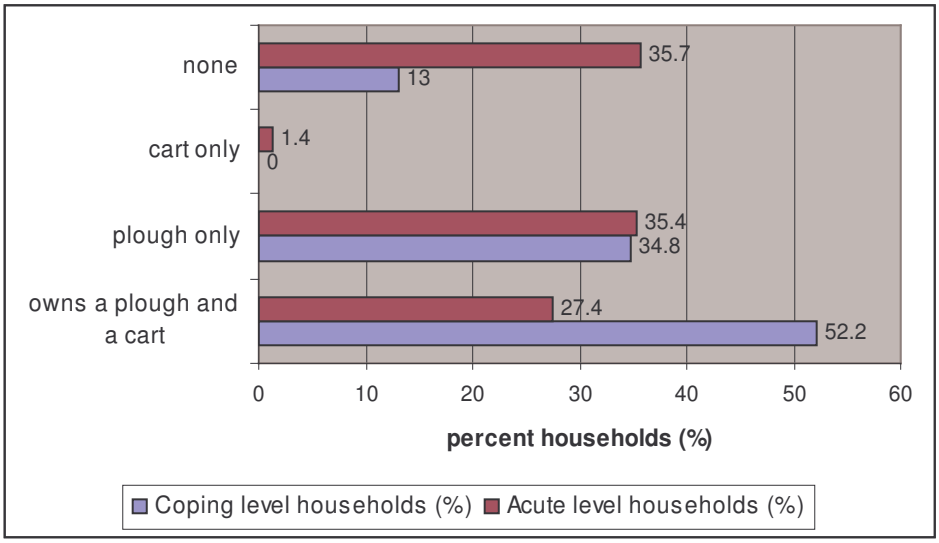
		Who is regularly sick			
		None	**Dependents only**	**Head and or spouse**	**Productive adults**
Coping Level	male	**66.7**	6.7	26.7	0.0
Households (%)	female	**75.0**	0.0	25.0	0.0
Acute Level	male	60.2	6.8	**32.4**	0.8
Households (%)	female	**52.8**	6.9	**38.9**	1.4

3.4 Impact of HIV and AIDS on the household physical capital base

3.4.1 Impact on ownership of farm implements

Household physical assets are defined by Stokes (2003) as those tangible assets and producer goods such as housing, household goods, furniture, tools and equipment, as well as livestock. There are basic farm implements that are important for effective agricultural production such as an ox-drawn plough. Ownership of such assets reduces a household's vulnerability. Results in Fig 9 show that a greater percentage of acute level households, i.e., 35.7% do not own any plough or cart compared to only 13% coping level households that do not own a plough or cart. Very few acute level households own both a plough and a cart (27.4%) compared to 52.2% coping level household that own both assets. Though there are generally high levels of asset poverty within the study community acute level households are worse off compared to coping level households.

Fig 9: Ownership of an ox-drawn plough and or cart



Source: survey data

3.4.2 Impact on ownership of livestock assets

Livestock, especially cattle, play a very important role in the livelihood of rural people in Zimbabwe. Cattle are a cultural symbol of wealth among African communities and this is no exception to Zimbabwe. Cattle represent a store of wealth which can be sold or exchanged to provide for other household requirements in times of need. Cattle also provide the much need draught power in agricultural production. There are other products that can be derived from cattle such as milk, meat, manure, etc that are very important to the livelihoods of rural communities. As such cattle ownership is a very important aspect to consider in assessing the impacts of HIV and AIDS on agricultural production and food security. The HIV and AIDS pandemic is reported to be resulting in sell and slaughter of cattle during funerals. Some cattle are lost especially because of the traditional inheritance practices that usually result in widows losing their livestock to the deceased husband's kinship. All this results in increased vulnerability in affected households. Results in Table 6 show that 44.4% acute level households do not own any cattle compared to only 8.7% coping level households. For those households that own at least one cattle 34.8% of coping level households own more than 4 cattle compared to only 14.6% acute level households.

Table 6: Cattle ownership across different vulnerability levels

	Cattle ownership		
	Do not own	**Own 1-4 cattle**	**Own more than 4**
Coping Level Households (%)	8.7	56.5	34.8
Acute Level Households (%)	44.4	41.0	14.6

There is very little difference in cattle ownership between female and male headed households regardless of the different vulnerability levels. Results are shown in Table 7 below.

Table 7: Cattle ownership across different vulnerability levels and gender of household head

		Cattle Ownership		
		none	**own 1-4 cattle**	**own more than 4 cattle**
Coping Level Households (%)	male	6.7	66.7	26.7
	female	12.5	62.5	25.0
Acute Level Households (%)	male	44.7	42.4	12.9
	female	44.1	39.9	16.1

A number of households within the study sample reported losses in cattle stock mainly due to drought (insufficient pastures) and other cattle diseases. Results in Table 8 show that more than 50% of copying level households lost at least 1 cattle over the past 3 years compared to less than 32% of acute level households. As shown in Table 6 above, a greater percentage of acute level households do not own any cattle or just own a few cattle. Thus the chances of these households losing what they don't have in the first place are minimal.

Table 8: Cattle deaths in the last three years

	Number of cattle that died in the last 3 years		
	Did not lose any cattle	**Lost 1-2 cattle**	**Lost more than 2 cattle**
Coping level households (%)	43.5	34.7	21.8
Acute level households (%)	69.1	18.5	12.4

Generally a few households that own cattle did sell some for various reasons. FOSENET is aware of a debate among scholars of social development on the implications of selling of livestock on HIV and AIDS affected households. One school of thought states that cattle are a form of investment or savings for rural household which can offer a buffering mechanism or resilience to the household in the wake of a vulnerability shock such as HIV and AIDS. Hence this group of scholars believes that there is nothing wrong to find such households selling cattle in times of shock because they would have invested in light of such situations. Another school of thought states that a vulnerability shock such as HIV and AIDS results in unsustainable coping strategies, one of which is the sell of livestock. They believe that this leaves the household more vulnerable such that it will not be able to deal with the next wave of the shock. Nevertheless, FOSENET believes the impact of selling of livestock depends on the livestock asset base of the affected community. A community that already has a low livestock asset base will be negatively

affected by the sell of an extra beast and the reverse is true for communities with a larger livestock asset base. Results in Table 9 show that only 17% and 13% of coping and acute level households respectively that owned cattle did sell some over the last three years.

Table 9: Cattle sales in the last three years

	How many cattle did you sell in the last 3 years	
	Did not sell any cattle	**Sold at least 1 cattle**
Coping level households (%)	82.6	17.4
Acute level households (%)	86.9	13.1

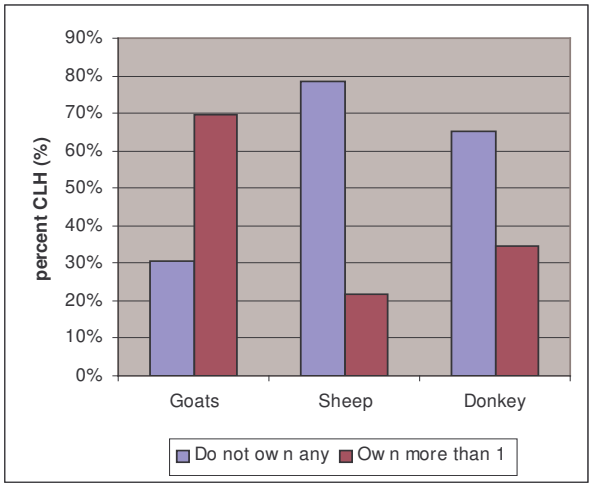
Approximately 58% of acute level households that sold their livestock did so because they wanted to pay school fees for their children whilst the majority of coping level households (75%) reported that they sold their cattle because they wanted to pay medical expenses. Approximately 22% of acute level households also sold their cattle so as to get money to buy food. Other reasons that were given by acute level households include payment of debt, ploughing and payment of lobola. Generally school fees represent an investment in education; medical expenses are an investment in heath and ploughing an investment in agriculture (Table 10). Households that sell their cattle to get money to buy food are worse off compared to those that sell to pay school fees or medical bills. Debt represents a form of a recurrent expenditure and households that sell cattle to settle a debt are likely to be more vulnerable. Because the livestock asset base in the study areas are low any sell of livestock will in the long term increase the vulnerability of that particular household.

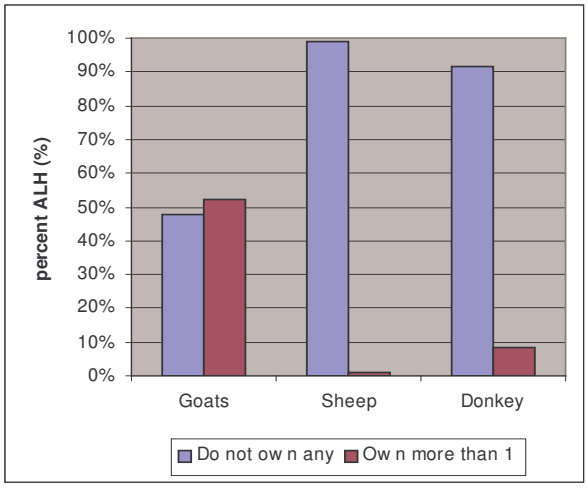
Table 10: Reasons for selling cattle

	Why did you sell the cattle					
	School fees	**Buy food**	**Medical expenses**	**Pay Debt**	**Ploughing**	**Bride price**
Coping level households (%)	25	0	75	0	0	0
Acute level households (%)	58	22	11	3	3	3

As alluded in the above section livestock asset base in the study communities is very low and this is also evidenced in Fig 10 a and b. Generally results in Fig 10 show that a higher percentage of coping level households owned goats, sheep and donkeys compared to acute level households.

Fig 10 a and b: Ownership of other forms of livestock





3.5 Impact of HIV and AIDS on Household Consumption Patterns

HIV and AIDS are alluded to affect household consumption patterns. This study sought to investigate the number of meals that are consumed by households under coping and acute level households. Results show that HIV and AIDS are resulting in affected and most vulnerable households eating fewer meals per day. A higher percentage of coping level households (56.5%) have three meals per day compared to only 22.7% of acute level households who have the same number of meals. The majority of acute level households (72%) did have two meals per day whilst a smaller percentage of the same group (5.4%) was having one meal per day.

Table 11: Meals eaten per day by the sampled households

	Number of meals per day available to the household		
	One meal	**Two meals**	**Three meals**
Coping level households (%)	0.0	43.5	56.5
Acute level households (%)	5.4	71.8	22.7

Most households indicated that they could not have the normal three meals per day because of insufficient food stocks. Hence reducing meals taken per day and also changing the time for the first meal of the day were coping strategies that households were using to cope with food shortages. Through probing research was able to establish that most households that were taking two meals per day would have their breakfast later in the mid morning so that they could skip lunch and then have supper in the evening.

As indicated in earlier sections of the report food diversity measured the types of food available to the sampled households in the past week before the survey was undertaken. Results in Table 12 show that a greater percentage of acute level households (79%) have an average to low food diversity. On the contrary approximately 86.9% of coping level households have an average to high food diversity.

Table 12: Food diversity among different households

	Food diversity		
	Low	**Average**	**High**
Coping level households (%)	13.1	30.4	56.5
Acute level households (%)	36.8	42.3	21.0

A higher percentage of male headed households, i.e., 73.3% under the coping level households have a high food diversity compared to female headed households in the same category. Generally the trend is fairly even for acute level households. There are no significant differences among male and female headed households in this category (Table 13). Generally as shown in Table 12 an average to low food diversity is evident for acute level households.

Table 13: Food diversity by gender of household head

		Food diversity		
		low	**average**	**high**
Coping level households (%)	male	6.7	20.0	**73.3**
	female	25.0	50.0	25.0
Acute level households (%)	male	38.9	39.7	21.4
	female	34.8	44.7	20.6

3.6. Impact of HIV and AIDS on the household financial capital base

HIV and AIDS affect a household's financial capital asset base. The pandemic tends to divert labour away from productive activities of the household to unproductive activities that are costly such as taking care of the sick member. This results in losses of potential income thus shrinking the household financial capital asset base. The death and incapacitation of the breadwinner of a given households due to HIV and AIDS means that the household can no longer access the cash income that was coming from formal employment. The pandemic is also alluded to result in high medical expenditures which further reduce a household's financial assets. Results from the Table 14 show that a greater percentage of households did not have any access to credit regardless of whether they are classified as coping or acute level households. Generally there are more acute level households that did not have access to any form of credit compared to coping level households. The results in the table are also showing that more female headed households in both categories of vulnerability had access to credit loans compared to male headed households. For those households that did access credit loans 33.3% and 37% male and female headed households under coping level households are part of community or formal credit scheme compared to 6.8% and 13.2% male and female headed households under acute level households. Other households were accessing some form of credit from extended families or neighbours. These results show that HVI and AIDS are making acute level households worse off compared to coping level households.

Table 14: Household access to credit loans by gender of household head

	Do you have access to credit loans		
	Part of a community or formal credit scheme	**No credit at all**	**Borrow from extended family or neighbor**

Coping level households (%)	male	33.3	60.0	6.7
	female	37.5	50.0	12.5
Acute level households (%)	male	6.8	90.2	3.0
	female	13.2	82.6	4.2

Table 15 shows that very few households in the study communities owned a savings account although more coping level households owned a savings account compared to acute level households.

Table 15: Household ownership of a savings account by gender of household head

		Do you have money in savings account at banks	
		yes	**no**
Coping level households (%)	male	13.3	86.7
	female	12.5	87.5
Acute level households (%)	male	1.5	98.5
	female	2.1	97.9

Generally a few of the sampled households had an unpaid debt. Results in Table 16 show very little evidence to conclude that HIV and AIDS are responsible for the insignificant differences between acute and coping level households. Those households that had an unpaid debt cited inability to pay back as major reason for not fulfilling the debt.

Table 16: Household unpaid debt by gender of household head

		Does the household have any unpaid debt	
		yes	**no**
Coping level households (%)	male	6.7	93.3
	female	12.5	87.5
Coping level households (%)	male	13.5	86.5
	female	15.3	84.7

Generally household expenditures in the study community are mostly on food followed by education and then farming inputs. Approximately 80% of acute level households spend most of their financial resources on food compared to 56.5% coping level households. Most of the remaining coping level households (30.4%) indicated that they did spend most of their financial resources on education compared to only 15.3% acute level households. These results show that acute level household are very vulnerability to the impacts of HIV and AIDS as they spend most of their financial resources on meeting household subsistence requirements instead of investing into education and farming. None of the coping level households indicated that they spend most of their financial resources on medical expenses whilst 1.1% acute level households did indicate that medical expenses constitute their major expenditure. Results in Table 17 show that for acute level households, fewer female headed households spend more on food and farming inputs but a larger percentage of these households spend more on school fees and health expense compared to their male counterparts.

Table 17: House expenditures by gender of household head

		Where do you spent most of your financial resources				
		food	Non food basic goods	school fees	health expenses	farming inputs
Coping level households (%)	male	60.0	0.0	33.3	0.0	6.7
	female	50.0	12.5	25.0	0.0	12.5
Acute level households (%)	male	83.2	0.8	12.2	0.8	3.1
	female	77.8	0.7	18.1	1.4	2.1

Given an opportunity for additional financial resources households in the study communities indicated various new expenditures that they would want to engage in. A larger percentage of coping level households, i.e., 43.5%, 8.7% and 4.3%, would want to increase their expenditure on farming inputs, savings and income generating projects respectively. On the other hand 42% and 31% of acute level household would spend their additional income on food and farming inputs. This shows that some households under the acute level of vulnerability are very vulnerable to an extent that they don't have sufficient food requirements and thus would use any additional income to buy food.

Table 18: Where households would spend any additional financial resources

	Where would you spend any additional financial resources							
	food	non food basic goods	school fees	health expenses	transport to work	farming inputs	savings	IGP
Coping level households	8.7	4.3	17.4	8.7	4.3	43.5	8.7	4.3
Acute level households	42.6	5.4	6.9	4.3	0.0	31.4	0.7	8.7

There is no significant difference between female and male headed households under acute level category in terms of where they would spend any additional financial resources. On the contrary, 25%, 37.5% and 12.5% female headed households under the coping level of vulnerability indicated that they would spend additional financial resources on education, savings and income generating projects respectively. This is not the case with male headed households under the same category. Approximately 13.3%, 13.3%, 13.3% and 46.7% of these households would spend additional financial resources on food, education, health and farming inputs respectively. This difference between male and female headed households, even those found under coping level households, in prioritizing the use of additional resources to the household need to be considered when designing intervention programmes meant to improve the food security status of HIV and AIDS affected communities.

3.7. Impact of HIV and AIDS on household social capital base

As pointed out earlier on, the illness and death of household members due to HIV and AIDS can disrupt a household's links to their extended family and the larger community due to the stigma that is attached to HIV and AIDS. This can also expose affected household to the risk of food insecurity by limiting the household's ability to access

community resources or receive family support. Membership to various social groupings or clubs within a community is also key to enhancing an affected household's resilience to the impacts of HIV and AIDS. Household derive a number of benefits from community social clubs ranging from monetary to emotional and spiritual support. Thus, social networks of rural households operating through their relationships with extended kin and the community are critical to their ability to recover from the illness and/or death of a household member due to HIV and AIDS.

3.7.1 Membership to social clubs within the community

Results in Table 19 show that fewer acute level households are members of community clubs compared to coping level households except for church groups where 77.9% of acute level households are members. This may be due to the emotional and spiritual support that is offered by churches and is badly needed by the poor and vulnerable group of any society.

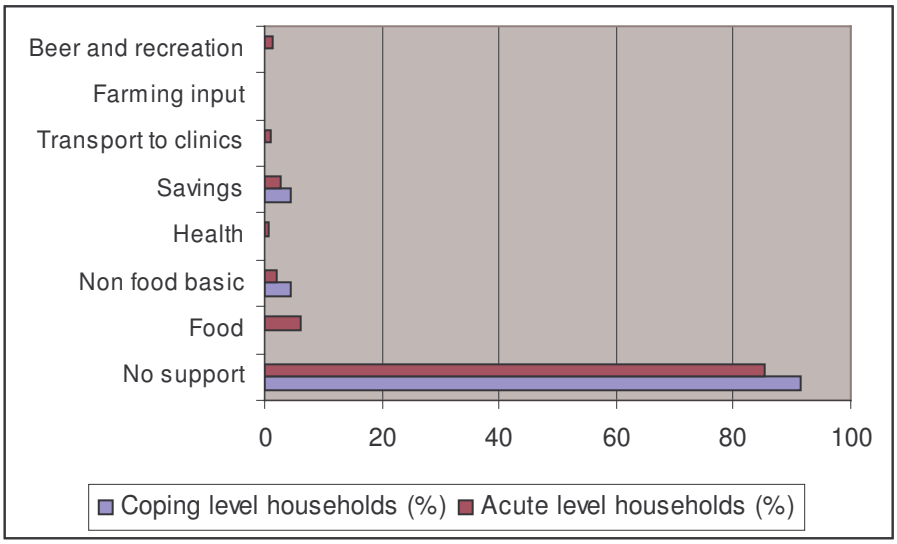
Table 19: Membership to social groups in the community

Membership to a social group	Coping level households (%)	Acute level households (%)	Most common support received
Women's club	13	5.8	Monetary support
			project skills
Burial Society	56.5	43.1	Funeral assistance
Garden club	39.1	18.5	Knowledge on gardening
Support group	17.4	13	Knowledge on HIV and AIDS
			Emotional counseling
Church group	69.6	77.9	Spiritual and emotional support

3.7.2 Support received from Local community, NGO and Government

Vulnerability of rural households to the impacts of HIV and AIDS increases if the concerned households receive little or no form for support from community, government through its different departments and NGOs working within the various communities. Results in Fig 11 show that generally the sampled households received very little support from their communities. Approximately 6.1% of acute level households received food support from the local community whilst only a few households received some form of support in savings and non food basic commodities from the same group.

Fig 11: Support received from community



There was also little to almost no support that was reported by households as coming from the government departments especially as far as food security is concerned. Less than 2% acute level households indicated that they had received food support from the GMB. None of the coping level households indicated that they received any support from any government departments as far as food is concerned. This is because the type of support that government provides to the study communities is mainly in the form of public services such as agricultural extension services, veterinary services, educational and health services most of which indirectly affect agriculture and food security but are intangible hence not recognized by the sampled households as direct food support.

Results in Table 20 below also show that 69% of acute level households did not receive any support from NGOs compared to 39% for coping level households. This makes acute level households even more vulnerable to impacts of HIV and AIDS. Although it appears an equal percentage of households in both categories of vulnerability are receiving food support from NGOs, a higher percentage of coping level households are receiving support in the other areas of savings, farm inputs, education and income generating projects compared to acute level households.

Table 20: Support received from Non Governmental Organizations

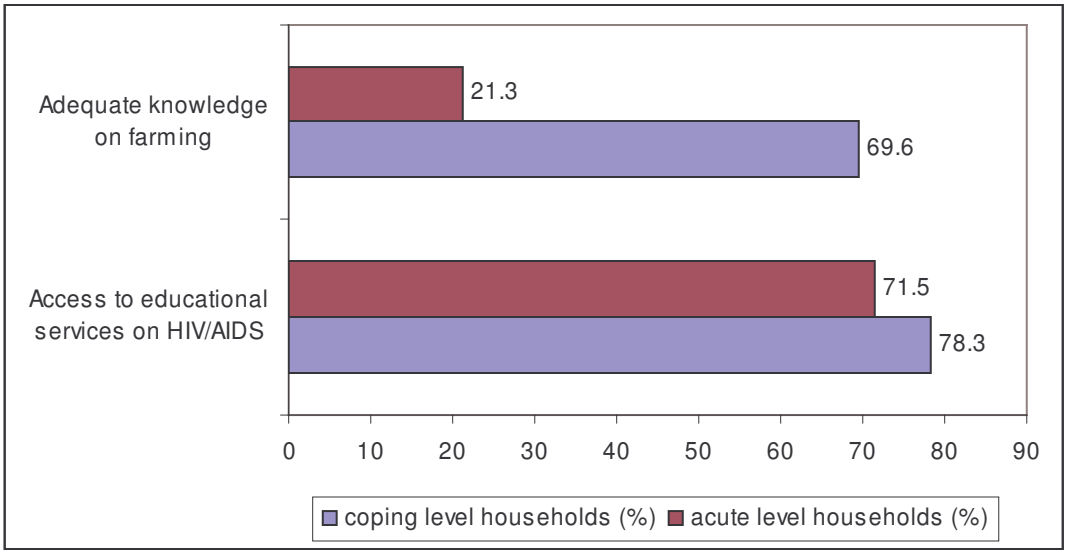
	First most useful support from NGO					
	n/a	food	savings	Farming inputs	school fees	IGP

Coping level households (%)	39.1	21.7	4.3	21.7	8.7	4.3
Acute level households (%)	69.0	20.2	0.0	6.1	2.5	2.2

3.7.3 Access to information

Households that have access to information especially that related to HIV and AIDS and knowledge on farming are better prepared to deal with the impacts of pandemic hence less vulnerable. Results presented in Fig 12 show that more coping level households had access to adequate knowledge on farming and training or educational services on HIV and AIDS compared to acute level households.

Fig 12: Access to information on health and agriculture



The differences on access to farming knowledge could be partly due to the fact that a higher percentage of acute level households (69.6%) are reportedly missing extension meeting due to various reason including illness or deaths within their households and communities compared to coping level households (21.3%). This then affects their participation in some of the knowledge sharing platforms within their communities.

3.8 Impact of HIV and AIDS on natural capital base

HIV and AIDS can result in serious deterioration in the natural capital as the declines in human and financial capital due to illnesses and deaths could limit household's ability to invest in maintaining and improving their land base (Stokes, ibid). Despite the fact that land is the most important primary natural asset that rural households possess, adversely affected households sometimes end up being disposed off their land especially after the death of the household head. HIV and AIDS can also result in affected household resorting to the environment for survival as a form of a coping strategy to deal with some of the impacts of HIV and AIDS. Usually this harvesting of the forest is unsustainable which further increases the vulnerability of such households.

Results in Table 21 show little or no evidence of the impact of HIV and AIDS on land utilization in the studied communities. Approximately 21.7% of household classified as coping with the impacts of the pandemic are reporting to have failed to cultivate all of their land due to sickness within their households compared to only 12% acute level

households. This could mean that coping level households are more vulnerable to the impacts of the pandemic as far as land utilization is concerned or there some other factors that are responsible for differences.

Table 21: Household that failed to cultivate all of their land due to sickness

	No	Yes
Coping level households (%)	78.3	21.7
Acute level households (%)	87.7	12.3

Results also show that there is virtually no difference between coping and acute level households as far as loss of land after the death of the household head is concerned. A few households (less than 5%) for both categories of vulnerability are reported to have lost their land after the death of the household head.

There is also very little difference between coping and acute level households as far as soil improvement and water collection from unsafe wells is concerned (Table 22). On the other hand a higher percentage of coping level households (30.4%) reported to have missed participation in planned water or environmental management projects within their communities compared to only 17.3% acute level households. More acute level households (9.4%) seem to be resorting to the forest for survival compared to 4.3% coping level households. This shows that HIV and AIDS is resulting in households adopting unsustainable survival strategies such as tree cutting and firewood selling that affects the environment and hence vulnerability of such households in the long run.

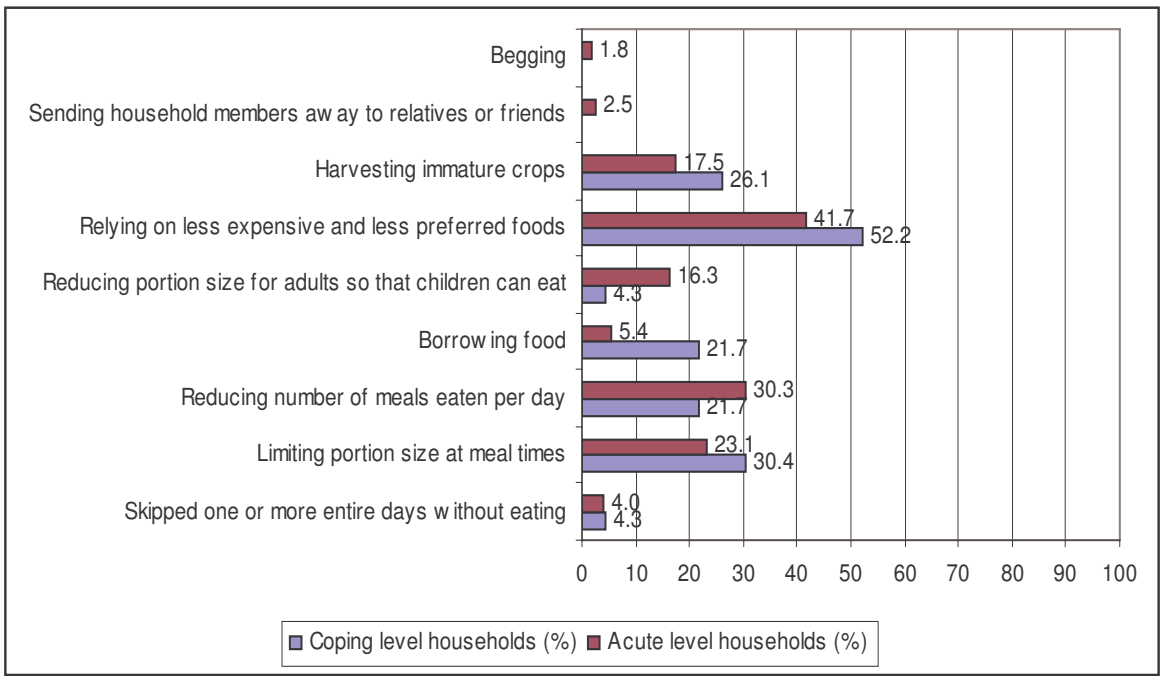
Table 22: Management and use of forest products

	Coping level households (%)	Acute level households (%)
Undertaken any activities that contribute to improvement of land or soil quality	100.0	89.5
Has the household ever missed participation in planned water or environmental management projects	30.4	17.3
Has the household ever collected water for cooking and drinking from nearer but unsafe sources	26.1	22.0
Has household ever resorted to cutting down trees and selling wood as a means of survival	4.3	9.4

3.9 Common strategies for coping with food shortages

There exist a number of strategies that are employed by households in both districts, i.e., Makoni and Chivi to cope with food shortages. There is little evidence of differences in these strategies across gender dimensions. Major strategies used by both coping and acute level households includes reliance on less expensive and preferred foods, reducing number of meals per day, limiting portion size at meal times and harvesting immature crops (Fig 13).

Fig 13: Coping strategies



There are some differences though in other coping strategies used by coping and acute level households. More acute levels households (16.3%) indicated that they reduce portion size for adults so that children can eat more compared to only 4.3% coping level

household who also indicated that they use the same strategy. On the contrary a higher percentage of coping level households 21.7% indicated that they sometimes resort to borrowing of food from their neighbors and relatives so as to meet household requirements compared to only 5.4% acute level households who employ the same strategy. There are some coping strategies, though drastic and short term, that are employed by acute level households. These include begging for food in the community and sending household members away to relatives and friends so as to reduce household food requirements. These strategies are used by less than 4.5% of acute level households. They are more of survival strategies that a households only resorts to if the food security situation deteriorates to unbearable levels and there exists no other options for accessing food.

Another food shortage coping strategy employed by less than 4.5% of both acute and coping level households is the skipping of one or more entire days without eating. This is quite disturbing because it means children also have to go for the whole day without eating. This affects mental capacity and their development hence their livelihoods in the long run. Most of the coping strategies discussed above though useful in the short term they are mostly unsustainable and result in increased vulnerability of the affected households. Hence the need for intervention programmes that are sustainable and meant to reduce food shortages within the affected households in the long run.

3.10 Sources of Vulnerability among the sampled households

Although vulnerability levels vary across households there is barely any difference in the sources or origins of this vulnerability between Makoni and Chivi districts or even across households in the same district. Vulnerability of the sampled households is coming from almost every aspect of their livelihoods although two sources are outstanding, i.e., financial capital assets with an average vulnerability score of 0.19 from a possible total of 0.35 and social capital assets with an average score of 0.11 from a possible score of 0.15.

On the financial capital side, reliance on bank savings and access to credit loans are the aspects showing the critical source of vulnerability within sampled households. From the social capital perspective, support from NGOs is coming up as the critical source of vulnerability among the households as well as support from other sources such as church groups besides government and community. In other words, those households with no access to credit, rely less on bank savings as a source of income as well as those who are not receiving any form of support from NGOs, government, etc are more vulnerable compared to households that have access to credit, has some bank savings and receive some form of support from the community, NGOs and government. Access to credit or bank savings gives a households the financial leverage required to support a households livelihood, i.e., supplement household's food requirements, invest in education, health and farming, buy agricultural inputs, access medical treatment, etc. This shows that the effect of having no access to financial capital within a household has a trickle down effect in that it affects almost entirely all the others aspects of a household's livelihood. Hence addressing this aspect within the sampled households is likely to result in higher marginal improvements on their wellbeing.

The importance of social support networks that exist within the study communities cannot be overemphasized. NGO in the study communities have different programmes targeted at different people in the society. Most programmes target PLWHA, OVC, female-headed households and household with sick members. Such households receive different forms of support ranging from food handouts, medical and educational assistance, farming inputs and IGPs. Such support reduces the vulnerability of the

targeted households to the impacts of HIV and AIDS. Government also provides educational assistance through the BEAM programme and medical assistance through the Department of Social Welfare. Although the medical assistance programme meant disadvantaged groups of the society still exist, of late the quality of services received by the recipients has been very low due to the inability of the Department of the Social Welfare to pay the medical doctors that attend to their clients. Other support networks such as the community, friends and relative also give some form of adhoc support to some of sampled households. The form of assistance received through these channels play an important role in the livelihoods of those households that have access and receive the support. As indicated in earlier discussions the rampant poverty within the study communities mean that almost every household is in need of some form of support in one way or the other despite the fact that they might not qualify in any of the existing programmes because of the targeting mechanisms in place. This shows the need to come up with poverty alleviation programmes that are meant to reduce vulnerability of the sampled household to poverty and hence impacts of HIV and AIDS.

Other sources of vulnerability within the study community are related to ownership of physical capital assets in the studied households. Livestock especially cattle ownership is very low among the sampled households as discussed in section 3.4.2. Livestock are a store of wealth within rural household and can be liquidated in times of need to buy food, pay for medical expenses and in most cases to pay school fees. Cattle ownership also determines availability and access to draught power that is very important in rural farming. Households that have timely access to draught power carry out all their farming operations in time and thus increase chances of producing more. Thus ownership of livestock determines the resilience of households to any vulnerability shock, including HIV and AIDS.

Chapter 4: Conclusions and Recommendations

4.1 Summary of Research Findings

The study produced a number of interesting observations and findings. The analysis managed to show that there are generally high levels of household vulnerability to the impacts of HIV and AIDS in Makoni and Chivi districts regardless of whether the households are classified by the community based targeting system as directly or indirectly affected. There are no significant differences between these two districts as far as their vulnerability is concerned. Makoni district have an average HVI of 0.42 and whilst that for Chivi is 0.44. These averages fall under the acute level of vulnerability and thus impying that both districts badly need assistance in some way if they are to survive. The HVI showed that most of this vulnerability is emanating from two major sources, i.e., financial and social capital assets of household livelihoods. Households with no access to credit, rely less on bank savings as a source of income as well as those who are not receiving any form of support from NGOs and local community are more vulnerable to the impacts of HIV and AIDS.

Findings also showed that approximately 5.5% of households that are classified as directly affected by HIV and AIDS are less vulnerable and hence fall in the coping level category whilst 90.3% households are more vulnerable to the impacts of HIV and AIDS but are classified as indirectly affected by HIV and AIDS. In light of scarce resources available for the fight against HIV and AIDS, such a system results in the wastage of resources.

Analysis to verify if HIV and AIDS were significantly affecting maize productivity per capita showed that HIV and AIDS factors, i.e., number of sick members and orphans within a household, emerge among the significant factors that explain differences in maize productivity per capita across households in the study areas. These results imply that households with AIDS-related sickness and orphans of HIV and AIDS are likely to have lower productivity compared to those without. Results also showed that factors that are highly significant in explaining variations in food diversity across households include presence of AIDS-related sickness and expenditures on food and farming inputs. Households that have sick household members are likely to be less food diversified especially due to the financial burden that sicknesses bring to household's financial resources.

Findings also showed that the majority of coping level households, i.e., approximately 70%, are adult male-headed households whilst the remainder are adult female headed households. More female headed households fall under the acute level of vulnerability compared to male headed households. All of the child and elderly headed households also fall under the acute level of vulnerability. These results confirm that child and elderly headed households are marginally disadvantaged socio-economic groups within any society.

There is general asset poverty in the studied communities especially considering livestock assets. Results show that acute level households have a high asset poverty compared to coping level households. Approximately 44.4% acute level households do not own any cattle compared to only 8.7% coping level households. For those households that own at least one cattle 34.8% of coping level households own more than 4 cattle compared to only 14.6% acute level households. These results show the extent of livestock assets poverty in acute level households.

HIV and AIDS are reducing the number of meals and the diversity of the food eaten by affected and vulnerable households. A higher percentage of coping level households (56.5%) have three meals per day compared to only 22.7% of acute level households. The majority of acute level households (72%) did have two meals. Results also showed that a higher percentage of acute level households had an average to low food diversity compared to the majority of coping level households that had an average to high food diversity.

Findings also established that the majority of households in the sample did not have any access to credit although it seems more acute level households compared to coping level household, did not have any access to credit. For households that had access to credit more female headed households were accessing credit compared to male headed households. Most households that were assessing credit are reported to have been part of a community or formal credit scheme.

Household expenditures in the study community are mostly on food and this is very common in acute level households where approximately 80% households spend most of their financial resources on food compared to 56.5% for coping level households. Investment in education and agriculture is quite minimal for acute level households compared to coping level households making these households more vulnerable to the impacts of HIV and AIDS. A closer look at acute level households revealed that more female headed households spend more on school fees and health expenses compared to the male headed households. Given an opportunity for additional financial resources households in the study communities indicated various new expenditures that they would want to engage in. Whilst a larger percentage of coping level households indicated that they would to increase their expenditure on farming inputs, savings and income generating projects respectively, most acute level household indicated that they would spend their additional income on food and farming inputs. This result gives an indication of the level of vulnerability in acute level households.

Households that receive support from any source which increase the immediate availability of food to the household are less vulnerable to the impacts of HIV and AIDS. Findings revealed that the majority of food support in the two districts is being rendered by NGOs. Households reported very little food support programmes coming from the government and the local community. Most coping level households are in NGO food support programmes. They also receive various other supports from the NGOs such as savings schemes, farm inputs, education and income generating projects. The majority of acute level households receive little support from NGOs but members of various church groups where they indicated that they receive emotional and spiritual support.

The study revealed mixed results when considering impacts of HIV and AIDS on natural capital. Whilst there was very little evidence of the impact of HIV and AIDS on land utilization, the pandemic seemed to impact on the use of forest products. Results indicated that coping level households were most vulnerable to the impacts of the pandemic as far as land utilization is concerned as more of these households failed to cultivate all of their land due to AIDS related sickness within their households compared to acute level households. Results also showed that more acute level households are resorting to the forest for survival through cutting down trees and selling of firewood compared to coping level households.

There was very little difference across gender dimensions and districts as far as strategies that households were employing to cope with food shortages. Most of the identified

strategies were short term and bound to be detrimental to the households in the long run. Major strategies used by both coping and acute level households includes reliance on less expensive and preferred foods, borrowing from neighbors and friends, reducing number of meals per day, limiting portion size at meal times and harvesting immature crops. These strategies were employed by both coping and acute level households. There are other strategies employed by a smaller percentage of acute level households such as begging for food in the community and sending household members away to relatives and friends so as to reduce household food requirements. These strategies were used by less than 4.5% of acute level households.

4.2 Recommendations

Some of the major recommendations emanating from this study are highlighted below:

Observation 1: *Makoni and Chivi district have average vulnerabilities that fall under the acute level of household vulnerability.*

Recommendation 1: With rapid social protection responses acute level households can be resuscitated. These social protection responses shouldld be informed by vulnerability anlaysis of the two districts. Basically since the study has managed to single out major sources of vulnerability, these should then inform intervention programmes meant to reduce the vulnerability of the two districts to the impacts of HIV and AIDS.

Observation 2: *Community Based Targeting system for identifying household that are directly affected by HIV and AIDS is targeting some households that are less vulnerable and hence should not be targeted and also excluding some households that are very vulnerable to the impacts of HIV and AIDS.*

Recommendation 2: There is a need to come up with a targeting mechanism that reduces inclusion errors as this will improve the use resources. Certainly an inclusion error of less than 1% is desirable. Community based targeting need to go under a verification process with some other independent system to check for inclusion errors.

Observation 3: *Household vulnerability is emanating from two major sources, i.e., financial and social capital assets of household livelihoods.*

Recommendation 3: Programmes need to be put in place to strengthen the financial assets of affected households and thus reduce the economic burden resulting from impacts of HIV and AIDS. There is an opportunity exist to scale up existing community and formal credit scheme projects as these have already proven to be an effective way of increasing financial resources to member households. Programmes should also be designed to strengthen the social fabric within communities and built upon community relationships and thus improving the existing social support networks. Certainly there is a room to extent the role that is being played by churches in the different communities to also include intervention programmes targeted at vulnerable groups of the society. This might involve capacity building of the churches so that they could organize and prepare themselves to be partners in the implementation of development programmes. Already there exist some models that can offer learning experiences such as the Diocese of Mutare Community Care Programme being implemented in some parts of Manicaland province.

Observation 4: *HIV and AIDS are two of the many factors that affect maize productivity and food diversity within the studied communities.*

Recommendation 4: It is not possible to consider HIV and AIDS in isolation from the other socio economic phenomena that affects agricultural production and food security in rural households. On the other hand it is detrimental for any development processes to ignore the effects of HIV and AIDS considering them as negligible. Efforts should be made to come up with wholistic approaches to food security that integrates all the different factors affecting agricultural production and food security. This will ensure the chances of successful and sustainable intervention programmes.

Observation 5: *All child and elderly headed households fall under the acute level of vulnerability*

Recommendation 5: Social protection policies that focus on these disadvantaged groups of the society need to be crafted so as to assist them fight both their internal and external vulnerability. Female headed households should also be considered as a disadvantaged group in the society. There is need to sensitize any development programme to consider how it will contribute to the livelihoods of the disadvantaged groups of the society.

Observation 6: *Most acute level households indicated that they would use any additional income to buy food*

Recommendation 6: This observation is important especially when considering new intervention programmes targeted for the study communities. Any efforts to assist households reduce their food insecurity in Makoni and Chivi districts, which do not address the immediate food requirements of these communities is likely to register very little success. Immediate household food requirements take precedence over any other activity that might improve household's food security in the long run. Efforts should be made to ensure that programmes that address household food requirements in the two districts are put in place.

Observation 7: *The study design was cross sectional in nature thus making it virtually impossible to compare differences across time***.**

Recommendation 7: Resources permitting, it will be interesting to redo the same survey in three or four years to come so as to establish time series data and a basis for comparison. This will make it possible to siphon out impacts that attributable to HIV and AIDS in a better way.

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Appendix 1

Steps in Computing the HVI

Step 1: Linking theory to practice, identifying data sources and variables that can be used

This was done by conducting a detailed literature review on the impact of HIV and AIDS on the 15 selected impact areas. The review mainly focused on empirical evidence that was observed through different studies in the Sub Saharan Africa. Through the literature review two or three variables were identified as indicators that would be used to test each impact area.

Step 2: Identify HIV and AIDS dimensions of impact and the impact areas (hypotheses) that fall under each dimension

Five dimensions of impact that is, the five livelihood assets that are affected by HIV and AIDS were identified using results from the 2004 FANRPAN Impact study. The study was able to reveal that HIV and AIDS affects the entire livelihood of rural households such that any effort to address the pandemic should consider all the five livelihoods assets of a household, that is., human, financial, physical, natural and social capitals. These were taken as dimensions of impact. These dimensions are defined by different impact areas that were also identified during that study and are outlined in Table A1. The impacts areas help explain how vulnerable households are to each of the dimensions.

Step 3: Assign weights to each dimension of impact using evidence from the ground and from literature.

The weights given to each impact area were determined as mentioned in section 2.4. The weights depended on the contribution of each livelihood asset to the livelihood of the target community i.e. the study area. Hence two different areas could have different weighting system depending on their livelihood strategies of their people. According to the HVI model, the sum of the weights are set at 100 so that the individual HVIs take values between 0 and 100, with 100 being full impact on the basis of selected dimensions. The higher the value the more vulnerable is the dimension.

Step 4: Select variables to be used to test each dimension.

These variables were determined from empirical evidence that was found in the literature. Two and sometimes three variables were identified to measure each impact area. For example three variables were identified to test *Changes in household demographic structure and labour availability,* that is., dependency ratio, household size and number of sick members.

Step 6: Transform the selected variables by setting an appropriate scale so that each variable falls between 0 and 1.

The transformation approach used depends on the variable of interest and how information on that variable is collected. A very simple approach has been used: an attribute of 1 is set whenever impact is felt 100%, and 0 if not. For dummy variables, that is, simple yes or no answers this can be achieved by setting 0 and 1 according to the direction of impact of that variable. Other values between 0 and 1 are set according to relative severity of impact. Other more robust techniques were also used and these are clearly outlined in the Table A1 which shows all the transformations that were used for each variable in the HVI computation.

Table A1: Variable Transformation Process

Dimension	Hypothesis tested	Variables for testing hypothesis	Transformation
Natural Capital	Soil fertility declines for vulnerable households as application of natural fertilizers declines.	Proportion of field fertilized by natural means. What proportion X of the fields is fertilized by natural means?	2X; CLH:50-100%=0, ALH:0-50%=1,ELH:none=2
	Barriers to access to land for agriculture increase vulnerability	Barred from use of land that you used to cultivate	No=0 Yes =1
	Households revert to the environment for "free" products such as wood when vulnerable. HIV and AIDS affected households rely more on the forest for their livelihoods.	Tree cutting or wood selling as a means of survival, wild fruits collection, environmental management in the presence of sickness or death, quality of water used by household, participation in water or environmental management	2X/5; CLH:answer yes to at most 1 question=0; ALH:answer yes to 1-3 environment questions=1; ELH:answer yes to at least 4 environment questions
	Affected households have difficulties in fully utilizing their land due to limited labour and draft power availability. Vulnerable households do not fully utilize their existing land	% of land not utilized due to sickness (X) What is the total land under cultivation (A)? What land is available but not cultivated due to illness or death in the last season (B) ?	X=B/(A+B) 0% =0 CLH:0-20%=1 ALH:20-50%=3 ELH:>50%=5
Human Capital	Affected households are vulnerable when they have sick members, and the more the number of sick members, the more the vulnerability. Also worse if the sick member is the head of the household.	Proportion of sick members (X). What is the total Household size (Y)? How many members are sick regularly (have been bedridden for at least three different times in the last year, with each bout extending to up to a week? Or have been diagnosed with any of TB, Meningitis, Caporsi Sarcoma, Hepatitis, Pneumonia (Z)?)	X=Z/Y
	Households that have productive sick members are more vulnerable.	Who is regularly sick None=0 dependent =1 productive adult = 2 Spouse=3 HH head = 4	Highest possible score
	Affected households have a greater number of dependents due to the increasing number of orphans in such households	Dependency ratio (economic burden)X :Number of dependants ({0-15}+{>65} +{bedridden or disabled})/Number of economically active.	Modified dependency ratio: X=dependants/total HH size. CLH: X<0.4; ALH: 0.4<X<0.75 ; ELH: X>0.75
	Female headed and/or child headed households are less able to cope with shocks, compared to male headed households	Age and gender of household head	CLH=0 ALH=3 ELH=6
	HIV and AIDS has caused disintegration in affected households	Household members who have moved away due to sickness or death	CLH: 0; ALH:2 CLH: 2
Physical Capital	Vulnerability especially to food insecurity increases with less use of fertilizers	Nitrogen fertilizer use for staple crop(X). What is your land size Y in ha? What is the weight Z of top dressing fertilizer used in the last season in Kg?	X=Z/400Y CLH:X>0.5; ALH:0.25<X<0.5; ELH: X<0.25

	Affected households have reduced harvests due to limited labour and draft power	Staple cereal output per capita (X). What is the total household size (Y)? How kgs of Maize were harvested (Z)? X=Z/Y	X=Z/150Y CLH:X>0.5; ALH:0.25<X<0.5; ELH: X<0.25
	Households that do not own an ox drawn plough or cart are likely to face difficulties in cultivation, planting and other farming operations.	Ownership of a plough or ox drawn cart	Owns a plough and cart = 0, plough only = 1 cart only =2 none =3
	Households that do not own or own fewer cattle and other livestock are more vulnerable due to limited access to draft power and alternative sources of income and nutritious food.	Productive livestock index X = 3c+ G+S+2D. How many Cattle do you own (C)? Goats (G)? Sheep (S)? Donkeys (D)?	CLH: X>6; ALH: 6>X.>3; ELH: 3>X
	Affected households adopt unsustainable short term coping strategies which might include the selling of assets such as livestock and farm	Livestock sales index X = (3c+g+s+2d)/(3C+ G+S+2D) How many Cattle do you own (C)? Goats (G)? Sheep (S)? Donkeys (D)? How many Z (=3c+g+s+2d) of each were sold in the last year?	CLH: X<0.2; ALH: 0.2<X<0.5; ELH: X >0.5
	Affected households have limited access to extension services due to ill health and inadequate time to devote to such activities.	Access to extension services	Used both = 0; used crop only = 1Used livestock only = 2; do not even know = 3
Financial	Households with little or no savings are more vulnerable	Reliance on bank savings	Every month = 0 In crises only = 1 Do not have many in the bank anymore=2 Do not own a bank account =3
	Affected households have fewer sources of regular income due to unavailability or limited number of formally employed members in a household	Regular sources of financial resources Salary (S), Crop Sales (Cs); Livestock Sales (Ls); Remittance from HH member (Rm), No regular source (Ns)	S=0; Rm=1 Cs=2; Ls=1; Ns=3
	Affected households have limited access to credit loans due to increased risks and lack of collateral associated with such households	Access to credit loans	Household is part of a community or formal credit scheme= 0 borrow from extended family/neighbour = 1 no access to credit loans at all = 3,
	Households with unpaid debts are most vulnerable.	Presence of unpaid debts	No=0, Yes= 3
	Affected households experience increased expenditure on health care due to the presence of more ill members in the household	Expenditure patterns. Food (F), Non-food basic goods (nF), Health (H), Savings (S), Transport to Clinics (Tc), Transport to Work (Tw), Farming inputs/implements (FI), Do not prioritize/plan (Nm) Other (o) , Beer and recreation (B), School Fees (SF),	FI/S/o=0, Tw/B/SF/F/nF=1, H/Tc/=2, Nm=1
	Use of additional resources indicate choices under vulnerability	Expenditure of additional financial resources Food (F), Non-food basic goods (nF), Health (H), Savings (S), Transport to Clinics (Tc), Transport to Work Tw), Farming inputs/implements (FI), Other (o) , Beer and recreation (B), School Fees (SF), Income generating projects (Pr)	FI/Tw/o/B/S/Pr=0, Tw/nF=1, Tc/SF=1, F/H=2
	Purpose for selling harvests indicates levels of vulnerability.	Use of revenue from crop sales Food (F), Non-food basic goods (nF), Health (H), Savings (S), Transport to Clinics (Tc), Transport to Work (Tw), Farming inputs including Veterinary (FI), Do not get enough to sell (Nm) Other (o) , Beer and recreation (B), School Fees (SF), Income generating	FI/S/o=0, Tw/B/SF/F/nF=1, Tc/=1, H/Nm=2

	Affected households eat less per day due to inadequate food availability	Meals per day	Breakfast, Lunch, Dinner, give 0 for each taken ie 1 meal= 3, 2 meals=2; 3 meals=0;
	Affected households eat less variety per day due to inadequate food availability	Describe the typical food stuffs in meals taken in your household? Maize (porridge/sadza/samp) (St), tea St, sorgum brew St, green vegetable V, wild fruit F, bananas/oranges/apple F, sugar cane St, pumkins V, groundnuts Pr sweet potatoes St, meat Pr, fish Pr,	Give 1 for each category taken, CLH:X>3 ALH: 2<x<3; ELH: X<2
Social Capital	The lesser the number and quality of support channels from external sources, the greater the vulnerability	What support was obtained from Government, NGOs, community and other external support networks in the last 3 months? Give the commonest 2. Food (F), Non-food basic goods (nF), Health (H), Savings (S), Transport to Clinics (Tc), Transport to Work (Tw), Farming inputs including Veterinary (FI), Do not get support(Ns) Other (o) , Beer and recreation (B), School Fees	Tc/H=0; Tw/B/SF/F/nF=1, FI/S/o=2, Ns=4
	The lesser the volume of support from external sources the greater the vulnerability	In which areas did support from Government, NGOs, community and other external support networks completely meet households' requirements? Food (F), Health (H), Transport to Clinics (Tc), Farming inputs including Veterinary (FI), Do not get support(Ns) School Fees (SF),	none=2 ; F/H=1; else =2
	The more informed a household is, the less vulnerable the household	1. Do you have adequate knowledge to cope with AIDS related illnesses for family members?, 2. Do you have adequate knowledge on type of crops to grow, and when to. 3. In any given season, do you know- in advance- the weather forecasts and use this forecasts	count of "No" answers

Step 7: Determine the contribution of each impact area to the overall weight of the corresponding dimension using selected variables

This was computed using a simple formula. This is given as:

> ***Weight of an impact area to a given dimension*** = *Extent to which a given impact area determines a given dimension (impact coefficient)* x *normalized value of the variable selected to test the impact area* x *the total impact score or weight for that dimension*

Step 8: Compute the total score of each dimension and the overall score for each household

The weight of each dimension of a given household is a function of the summation of the impact area scores in that dimension. All the impact scores for the impact areas defining each dimension were aggregated. Then the total score for each household were

computed by aggregating the scores for all the five dimensions for every household. An example of the HVI dimension score sheet is given in Table A2 below.

Table A2: An example of an HVI Dimension Score Sheet (Excel file)

Qn No.	Household status	Natural Capital	Human Capital	Physical Capital	Financial Capital	Social Capital	Total weight
		Total Score=10)	Total Score=20	Total Score=20	Total Score=35	Total Score=10	Total Score=100
113	**1**	6.0	9.4	5.9	27.2	7.31	55.8
114	**2**	6.0	18.0	5.8	26.4	7.46	63.7
115	**1**	11.6	9.4	8.4	26.1	7.31	62.9
116	**2**	6.0	0.0	10.0	25.3	7.46	48.7
117	**1**	9.8	9.4	7.9	27.1	7.31	61.5
118	**2**	6.0	2.9	5.5	26.4	7.31	48.1
119	**1**	6.0	8.5	10.0	25.1	7.46	57.0
120	**2**	11.6	5.7	8.1	25.9	8.23	59.5
121	**1**	9.8	2.9	7.3	25.7	8.54	54.1
122	**2**	12.6	0.0	9.5	25.7	7.31	55.1
123	**1**	6.0	0.8	5.9	26.8	7.31	46.8

**Higher scores indicate more vulnerability

Step 9: Computing the HVI for every household

As an index the HVI falls between 0 and 1. The individual HVIs for the households were computed by dividing the calculated total scores for the households with the total possible score when there is full impact which was set at 100.

Step 10: Categorizing household according to their level of vulnerability

Households were classified into three levels of vulnerability, that is., coping level households, acute level households and emergence level households. These cut off points were determined after careful consideration of the different situations that make a household less vulnerable and hence cope with the disease or more vulnerable and become an emergency case. The study simulated a coping household and calculated its HVI. This was used as the cut-off point for coping households. The process was repeated for the acute level household, applying sensitivity analysis for each of the dimension areas. The cut off points for the levels are given in Table A3

Table A3: Categories of vulnerability and the cut-off points

Categories of Vulnerability	Cut-Off Points
Coping level Households (CLH)	HVI of 0.33 and below
Acute level households (ALH)	0.33 < HVI < 0.66
Emergency level Households (ELH)	HVI greater than 0.66