IMPACT OF HIV & AIDS ON AGRICULTURE AND FOOD SECURITY: THE CASE OF LIMPOPO PROVINCE IN SOUTH AFRICA

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LIST OF ACRONYMS AND ABBREVIATIONS USED

AIDS Acquired Immune Deficiency Syndrome
FANRPAN Food, Agriculture and Natural Resources Policy Analysis Network
FGD Focus group discussion
HIV Human Immunodeficiency Virus
HSRC Human Sciences Research Council
HVI Household Vulnerability Index
MHBGC&CC Molepo Home Based Care and Counselling Centre
PRA Participatory Rural Appraisal
PRCA Participatory Rural Communication Appraisal
STI Sexually transmitted infection
TB Tuberculosis
EXECUTIVE SUMMARY

Background and objectives
South Africa is amongst the countries hardest hit by the HIV/AIDS pandemic in Sub-Saharan Africa. According to UNAIDS 2002, the HIV/AIDS prevalence rate amongst adults in South Africa was 20.1% and up to five million adults and children were estimated to be living with HIV/AIDS at that time. The smallholder agriculture sector, relying mainly on labour because of the low levels of mechanisation, has not been spared by the pandemic.

Agriculture and related forward and backward industries contribute about 13% to the country’s GDP and provide a source of livelihoods for about 40% of the country’s population. An estimated three million smallholder farmers reside in communal areas of the former homelands, and practice subsistence agriculture. Agriculture has much to contribute in government efforts to bridge the economic divide between the first and the second economy, and the HIV/AIDS pandemic has potential to erode any such efforts.

There is a dearth on information on the impacts of HIV/AIDS on smallholder agriculture in South Africa. Most notable contributions are descriptive in nature and reliant on cross sectional analysis, with no specific focus on smallholder agriculture. There is a need for further information that quantifies the impacts of HIV/AIDS on agriculture and food security, and enables comparison with other states in the SADC region to facilitate collective action at regional level. In response to this need the Food Agriculture Natural Resources Policy Analysis Network (FANRPAN) in collaboration with the SADC Health Sector Coordinating Unit commissioned a regional study to assess the impacts of HIV/AIDS on agriculture and food security. South Africa is one of the seven countries where a study was initiated.

The main objective of the study was to investigate the impact of HIV/AIDS on agricultural production and food security and to examine the changes in decision making as a result of HIV/AIDS and/or related illnesses within households and to identify the coping strategies adopted by affected households. Specifically the study investigated the impacts of the pandemic on (i) household demographic structure, (ii) labour supply, (iii) agriculture production, (iv) household livelihood and capital assets and (v) household food security. The study also investigated the mitigation and coping strategies adopted by smallholder agriculture households faced by the pandemic.

Study design
This study was conducted in the Capricorn district of the Limpopo province. The site was selected purposively due to the fact that it has one of the highest prevalence rates of HIV/AIDS in the province, and amongst the poorest areas in the district. Moreover, majority of households are involved in subsistence agriculture. Households from seven villages were stratified into ‘affected’ and ‘non-affected’. An ‘affected’ household was defined as a household in which at least one family member was chronically ill due to HIV/AIDS and related illnesses at the time of the survey, and at least one family member had been lost due to HIV/AIDS or related illnesses in the last three years. A ‘non-affected’ household was defined as a household in which no member has died of, or is living with HIV/AIDS related diseases. A total of 218 households were randomly selected with 100 household falling in the affected category and 118 households in the non-affected category. Data was collected using structured questionnaires from the selected households, followed by focus group discussions and community seminars in three of the villages.
Research Findings

The study shows that a greater proportion of affected households (53%) are headed by females compared to 46% for non-affected households. The study found out that there are differences in terms of the mean age of the household, with affected households being headed by on average more elderly household heads than non-affected households. Female headed households are common, and less than half of the households are headed by both parents who are resident at the household. Female headed households have higher dependency ratios than male headed households. Households headed by elderly people (i.e. head above 60 years of age) have relatively higher dependency burdens than households headed by persons under 60 years. Furthermore, most of the affected households have heads educated up to primary level, whilst the non-affected households have more heads educated up to matric and diploma levels. Regarding labour supply, it was found that where there were long illnesses without a death, child illnesses affected cultivation activities more than adult illnesses and adult deaths. There is significant evidence that the HIV/AIDS pandemic affects household dependency ratios, changes household demographic structures and reduces labour supply to various household activities.

The mean value of purchased input used by death- and illness-affected households were significantly different from the non-affected group, but not from each other. Compared with non-affected households, death-affected and the illness-affected ones spent less on purchased agricultural inputs. There were no differences in ownership of household assets between the affected and the non-affected households. Almost 50% of households in the sample owned a television set and an even higher proportion owned a radio. The results also indicate that there is no difference in terms of livestock ownership between the two groups of households. The most commonly owned agricultural implement is a wheelbarrow whilst just about a tenth of both the affected and non affected households own ox an drawn plough.

The study did not establish any changes in land ownership as a result of the HIV/AIDS pandemic. Some households stopped using some of its pieces of land after the death of a household member. The mean size of land holding for affected households was estimated to be 2.17 hectares, and 2.37 hectares for non-affected households. Almost a third (32.6%) of the affected households, and a fifth (20%) of the non-affected households reported non utilization of all land allocated for crop production. The cultivated land area decreased when an adult died or experienced a long illness, and when a child was ill. The reduction in acreage under crop production is likely to impact on total agricultural production for these households, and for the affected households is likely to affect the food security status of households. Reasons for failure to use all of the allocated land included lack of money for inputs, lack of time since most of the time was taken up looking after sick persons.

Some households had shifted from sorghum to maize production although sorghum is considered a quality grain in the area. The study failed to prove that the changes in crop mix were due to the impacts of illness or death in the household. Most of the families in the surveyed area (35.3%) received their inputs from relatives, either resident locally or elsewhere. About 34.2% of the households reported that they purchased inputs from local shops which are within a radius of about 8km, whilst some few households indicated that they got their inputs from NGOs or government agents and about 16.6% of households reported that they used recycled seed.

Households which were affected by death or illness of a household member were asked to rank the effects of illness on agriculture and general welfare of the households. The most common impacts of illness included the loss of time that would otherwise be used for agriculture, off farm activities, and household chores. Households affected by illness face a problem of labour supply for agriculture and make up for this by hiring extra labour. Most of this labour is paid in kind.
Sales of household property, farm assets or livestock did not appear to be prevalent, although they had been experienced by some households. About 88% of the households that experienced death, had slaughtered an ox. Only 1.4% of households reported loss of assets as a result of death. For most households in the area that had experienced death, livestock was left for the deceased’s family, whilst clothes and utensils were in some instances shared amongst all present.

Food security is a function of household’s production levels as well as the ability of the household to earn income and allocate that income towards purchase of food for all members. There was minimal participation in both crop and livestock outputs markets for both affected and non-affected households, indicating that households are at best only producing enough for home consumption with no surplus for sale. Households affected by the HIV/AIDS and related chronic illnesses experienced a decline in their food and education expenditures. Effects of HIV/AIDS on food security were found to be much higher for households that have experienced death than those that experience illness only. The government grants are significantly contributing to households’ food security status, even in the face of illness.

Household vulnerability indices were computed to determine the extent to which HIV/AIDS and other related factors impact on a household’s vulnerability to food insecurity. The results indicate that about (70%) of the households fall under the acute level households which are households that have been hit so hard that they badly need assistance to the degree of an acute health care unit in hospital. With some rapid-response type of assistance these households may be resuscitated. About 29% of the households fell under the coping households’ category, which means the households are vulnerable to food insecurity but they still cope on their own. A small percentage of the households (about 1%) fall under emergency level households which are the equivalent of an intensive care situation – almost a point of no return – but could be resuscitated only with the best possible expertise.

Mitigation Strategies
Households and communities affected by the HIV/AIDS pandemic often devise means of coping with the pandemic itself and the associated problems. Hiring of extra labour to assist in agriculture is one of the coping strategies for affected households. This however puts further pressure on the household’s income, if the hired labour is paid in cash. Children have also been increasingly called upon to assist with household chores and agricultural activities in affected households.

The study found that remittances from non-resident household members and relatives often contribute towards total household income and food security. The increasing rate of unemployment in the country may however render this strategy unsustainable in the long run. Food parcels distributed by the Social Welfare Department have been helping a lot of affected households to cope with illness and death. Similarly the pension grants, the orphan/foster care grants and the child grant are often the only sources of income for both affected and non-affected households in the area.

Community initiatives such as locally based home care groups have also been assisting affected households with information, helping in care giving and counselling. The is however need for government to support such initiatives as their activities are often constrained by lack of operational funds as well as paltry allowances for volunteers.

Policy Recommendations
Food security policies and programmes need to harness the strengths of national, community, and household food security initiatives to confront and challenge the impact of HIV/AIDS on
agricultural food insecurity. Further, harnessing the political will to provide security for smallholder agriculture from internal/external threats and from market forces is required. More needs to be done to enable better participation of vulnerable households in input and output markets. Knowledge management and transference between family members, particularly women and children to enable the transformation to wealthier landholders who can protect productivity and provide food security while ensuring sustainability in the longer-term. The observation that households exhibit different levels of vulnerability to food insecurity in the face of the HIV/AIDS and other related factors shows that there is a need for differentiated policy responses that target households with different needs. Further we recommend changing the strategic aim of agricultural and rural support services in the nodal areas to include achieving food security and poverty alleviation. This can include public works employment schemes as well as support to community based income generating project initiatives.

Research and information dissemination on HIV/AIDS emphasizing, the particular needs of HIV/AIDS positive persons in nutrition, and various ways in which households can mitigate and cope with death and illness, whilst maintaining agricultural productivity. There is need for investment in micro-finance schemes, infrastructure and knowledge (technical and indigenous). Community home based support groups have a role to play in the HIV/AIDS pandemic and are better suited to help households mitigate the pandemic. Lastly we recommend that similar studies be commissioned with wider coverage and enable longitudinal analysis by tracking the households in the baseline survey.
SECTION ONE: BACKGROUND AND INTRODUCTION TO THE STUDY

1.0 INTRODUCTION

1.1 Extent of the HIV/AIDS Pandemic

The HIV/AIDS pandemic presents, perhaps, the greatest challenge to global efforts to attain development in the Third World, as it threatens to reverse the gains made towards human development over the past decades. The potential damage of the pandemic becomes considerably worse in regions such as sub-Saharan Africa that are still recovering from natural disasters ranging from floods, droughts and pest infestations, that have occurred in the last decade. Whilst considerable effort has been made in ensuring that vulnerability of households in sub-Saharan Africa to drought and consequently food insecurity is minimized, these efforts need to be revisited in light of the ramification so of the HIV/AIDS pandemic.

It is estimated that over 90 percent of the close to 40 million people which are thought to have been infected worldwide with the virus since the start of the epidemic live in developing countries, and with approximately 25-28.2 million HIV infected adults and children, as of late 2003, sub-Saharan Africa is the region hardest hit. This represents around 70 percent of the world total. Of the 8 500 new infections that occur daily worldwide, 50 percent are in Sub-Saharan Africa. It is estimated that around 17.5 million adults and 4.3 million children worldwide have already died since the start of the global epidemic, leaving 14 million orphans as of 2001 (FAO, 2003; http://www.avert.org/statindx.htm). If the current epidemic trends continue through the end of this decade, it is estimated that between 30 and 40 million adults will have been infected with HIV by the year 2010. Of these, about 60 percent will be in Sub-Saharan Africa (FAO, 2003).

One-third of the global population living with HIV is in the SADC countries. A study by UNAIDS 2003 indicates that 13.79 percent of the adult population is infected with HIV,
although there is a great variation among countries, from 0.1 percent in Mauritius to 38.8 percent in Botswana. A review of the data from the SADC region is given in Table 1.1. Of the 25 million people estimated to be living with HIV and AIDS in Sub-Saharan Africa by end of 2003, about 5 million were in South Africa (UNAIDS, 2004). Indications are that about a quarter of a million people in South Africa will die each year from the disease, and that this figure will continue to rise. Average life expectancy is expected to drop from 60 to about 40 years by 2008 (www.aids.org.za).

Table 1.1: HIV prevalence, infections, orphans and deaths in the SADC region in 2001

<table>
<thead>
<tr>
<th>Country</th>
<th>Estimated Adult Prevalence %</th>
<th>No. of adults and children living with HIV/AIDS</th>
<th>AIDS orphans</th>
<th>AIDS deaths (adults and children)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angola</td>
<td>5.5</td>
<td>350 000</td>
<td>100 000</td>
<td>24 000</td>
<td>13 527 000</td>
</tr>
<tr>
<td>Botswana</td>
<td>38.8</td>
<td>330 000</td>
<td>69 000</td>
<td>26 000</td>
<td>1 554 000</td>
</tr>
<tr>
<td>D R Congo</td>
<td>4.9</td>
<td>1 300 000</td>
<td>930 000</td>
<td>120 000</td>
<td>52 522 000</td>
</tr>
<tr>
<td>Lesotho</td>
<td>31</td>
<td>360 000</td>
<td>73 000</td>
<td>25 000</td>
<td>2 057 000</td>
</tr>
<tr>
<td>Malawi</td>
<td>15</td>
<td>850 000</td>
<td>470 000</td>
<td>80 000</td>
<td>11 572 000</td>
</tr>
<tr>
<td>Mauritius</td>
<td>0.1</td>
<td>700</td>
<td>No data</td>
<td>&lt;100</td>
<td>1 171 000</td>
</tr>
<tr>
<td>Mozambique</td>
<td>13</td>
<td>1 100 000</td>
<td>420 000</td>
<td>60 000</td>
<td>18 644 000</td>
</tr>
<tr>
<td>Namibia</td>
<td>22.5</td>
<td>230 000</td>
<td>47 000</td>
<td>13 000</td>
<td>1 788 000</td>
</tr>
<tr>
<td>South Africa</td>
<td>20.1</td>
<td>5 000 000</td>
<td>660 000</td>
<td>360 000</td>
<td>43 792 000</td>
</tr>
<tr>
<td>Swaziland</td>
<td>33.4</td>
<td>170 000</td>
<td>35 000</td>
<td>12 000</td>
<td>938 000</td>
</tr>
<tr>
<td>Tanzania</td>
<td>7.8</td>
<td>1 500 00</td>
<td>810 000</td>
<td>140 000</td>
<td>35 965 000</td>
</tr>
<tr>
<td>Zambia</td>
<td>21.5</td>
<td>1 200 000</td>
<td>570 000</td>
<td>120 000</td>
<td>10 649 000</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>33.7</td>
<td>2 300 000</td>
<td>780 000</td>
<td>200 000</td>
<td>12 852 000</td>
</tr>
<tr>
<td>Total/Average</td>
<td>13.7</td>
<td>14 690 700</td>
<td>4 964 000</td>
<td>1 180 000</td>
<td>207 031 000</td>
</tr>
</tbody>
</table>

Source: UNAIDS (2002)

About 35% of South Africa’s population is estimated to be vulnerable to food insecurity (de Klerk, et al., 2004). As more than 20% of South Africa’s population is HIV-infected, an even greater number, 35%, is affected by the impact of food insecurity. The two vulnerabilities form a vicious cycle. The complexity of the challenge of HIV and AIDS in South Africa is attributed to many factors such as, among others (www.aids.org.za):

- Social and family disruption as a consequence of apartheid and migrant labour;
• High mobility and a good transport infrastructure, making the spread of the disease easier;
• High poverty and low education levels, resulting in commercial sex work and higher levels of risk-taking behaviour;
• A transforming and burdened health system;
• An overwhelmed and an inadequate welfare system.

Despite efforts being made to contain the spread of the disease, the number of people infected by HIV in South Africa continues to increase, in keeping with the worldwide trend. It has become a complex problem that transcends many facets of life. Although HIV/AIDS is a medical problem, it has social, economic, political and other dimensions as well. It has now become a development issue, especially since it is most widespread in poverty-stricken, developing areas. Research around the epidemic is increasingly taking the epidemic’s multi-faceted nature into consideration. Yet more needs to be done.

1.2 Agriculture in South Africa’s Economy

Primary agriculture’s contribution to South Africa’s total GDP has declined from 9.1% in 1965 to 3.1% in 2001 (Vink and Kirsten, 2003). The total GDP contribution for agriculture and related backward and forward industries is an estimated 13%. Total agricultural exports amount to almost 10% of South Africa’s total exports. Despite its rather low contribution to total GDP, agriculture is still considered an important sector in the South African economy, and the backbone of growth and development in the country. When the country was hit by floods in 2000, the total economic growth rate declined by one percent, demonstrating the influence of the sector on the total economy (NDA, 2001).

About 1 million employees are employed on commercial farms, whilst the country has more than 240 000 small farmers who provide a livelihood to more than 1 million people and occasional employment to another half million people. An estimated 3 million farmers reside in communal areas of the former homelands and produce food at subsistence level. More than 40% of the South Africa’s total population is dependent on agriculture and related industries for their livelihoods (NDA, 2001). The strategic goal for
agriculture in the country is to ‘To generate equitable access and participation in a globally competitive, profitable and sustainable agricultural sector contributing to a better life for all’ (NDA, 2001). Agriculture and related policies are instrumental in addressing the past injustices and inequalities as well as the poverty and unemployment problems that face the country. Development of sustainable and efficient agriculture is also expected to lead to improved national and household food security and drive the process of rural development.

The HIV/AIDS pandemic undermines government efforts to develop agriculture, particularly in the smallholder sector, food security, and poverty alleviation. This study commissioned by FANRPAN aims to contribute to the growing body of knowledge on how the HIV/AIDS pandemic impacts of agriculture production, food security and natural resource use in rural households, as well as to document the survival/coping strategies that are adopted by households that have been hit by the pandemic.

1.3 Problem Statement

HIV/AIDS affects labour allocation to agriculture, household access to production resources as well as the household’s ability to participate in input and output markets. According to the United Nations Development Programme 2000, the Human Development Index of South Africa will be lower by 15% in 2010 due to the HIV/AIDS pandemic. Jayne, et al., 2004, order the effects of HIV and AIDS on agriculture in the rural household (and, by implication, on household food security) according to three categories namely, (1) effects on agricultural production and productivity, (2) effects on crop cultivation and production systems, and (3) effects on land distribution. With more than 40% of the country’s population dependent on agriculture and related industries, it is imperative that efforts to alleviate poverty and reduce unemployment focus on agriculture.

In designing agricultural policies and developing technologies it is important to integrate the challenges faced by both smallholder farmers and large scale farmers in the face of
the HIV/AIDS pandemic. Whilst the government is putting in place mechanisms to reduce unemployment and poverty and ensure access to basic services such as water, sanitation and a means of livelihood for all residents of the country the HIV/AIDS pandemic is reversing the gains made toward human and social development.

Several studies have been carried out in South Africa to assess the impacts of the pandemic on socio-economic welfare of households, much still remains to be done in terms of quantifying the impacts, and particularly determining the impacts on smallholder agriculture and food security. This is best achieved through longitudinal studies that are able to track the affected households and assess the impact over a longer period of time. This study will provide baseline data for future surveys that will be done to enable the time series analysis to be carried out at a later point. The current study measures impact in terms of comparing the differences in terms of key agriculture production, food security and demographic variables for households that are living with HIV/AIDS and those that are not directly affected by the pandemic. In other words the study uses the ‘with’ and ‘without’ scenarios to assess the impact of HIV/AIDS on agriculture and food security.

1.4 Study Objectives

The overall objective of this study is to investigate and analyse the impacts of HIV/AIDS on agriculture production and food security at the household level, and determine the extent to which HIV/AIDS contributes towards household vulnerability to food insecurity. The specific objectives of the study include:

- To review existing literature on HIV/AIDS and Agriculture in South Africa
- To investigate the demographic characteristics of households affected by HIV/AIDS and determine how these demographic characteristics impact on agriculture production.
- To determine the differences in agriculture production levels and agriculture production patterns between households affected by HIV/AIDS and those not affected by the pandemic.
To analyse the income and expenditure patterns of households affected by HIV/AIDS and those that are not, and explain how these patterns affect food security.

To determine the impacts of HIV/AIDS on household investment expenditure and capital stock.

To determine the vulnerability of households to food insecurity and explain the extent to which HIV/AIDS affects the vulnerability of households.

To investigate and explain the coping mechanisms which households adopt when there is incidence of HIV/AIDS and also find out the coping strategies at community levels.

1.5 Key Concepts Used In the Study

1.5.1 Unit of Analysis

The effects of the HIV/AIDS pandemic on agriculture and food security are faced at national level, community level and household level. The focus of this study is the impacts of the pandemic at household level. There is scope for future studies to assess the impacts at national and community levels. The household is the unit of analysis in this study and is also the decision making unit. The study adopts the definition of a household as ‘comprising a group of individuals that have a common source of income, and eat food cooked from the same pot’. The household is normally headed by a breadwinner who is usually the father or the mother of the children in the household. Because of the history of the country migrant labour is a common feature of households, resulting in wives heading the households whilst the husband or the father is working in the city. In this instance the wife will be the *de facto* household head, as opposed to situations where a woman heads the household without having a male resident elsewhere, i.e. *de jure* female headed. Defining the household as comprising members that eat from the same pot also implies that if the household has access to food then each member of the household also has access to food. The downside of this assumption is that it overlooks the fact that food and nutritional requirement differs between household members, specifically adults and children.
1.5.2 Agriculture and Food security

Agriculture as an economic sector spans from the input supply chain, through production, raw commodity marketing, and various value adding services that take place along the marketing chain. It also includes the various services to the sector, both public and private services. The study focuses on agriculture production at the household level, specifically smallholder agriculture. It covers the input procurement decisions that are made by the household as well as the actual production decisions integrating labour allocation, capital, and land use. Lastly, the study considers the agricultural output marketing that the household engages in. More emphasis is put on crop production as this is more prevalent in the study area, and has greater implications for food security and labour use in the smallholder sector.

The main elements to be considered when defining food security are: sufficiency, access, security and time. Fraser et al, citing the World Bank (1986) explain that food sufficiency is enough food to supply the energy needed for all family members to live healthy, active and productive lives. “Access” refers to whether or not individuals and households have the means to acquire sufficient food either through production or the earning of income to be exchanged for food. “Security” encompasses the ability of households and individuals to resist crises that threaten their achieved level of food consumption. “Time” is concerned with secure access to sufficient food at all times (Fraser, et.al, 2003 ). The point is all four elements have to be present before it can truly be said that an individual is food secure. This study will consider the ability of the household to produce or to purchase food as indicated by agriculture production levels, total household income, expenditure on food, household dependency ratios as well as availability of safety nets such as the social grants as determinants of household food security.

1.5.3 HIV and AIDS

One of the greatest challenges in conducted HIV/AIDS studies relates to the unwillingness of communities and individuals to discuss the pandemic. The stigmatization of the disease and the emotional trauma that affected persons go through
make it particularly difficult to ask direct questions in HIV/AIDS studies. The study, like most other studies on HIV/AIDS (Dike S, 2002) uses proxy measures such as the incidence in the household of HIV/AIDS related illnesses, particularly in the sexually active age group. The study also relied on information supplied by home based care groups who are working in the community, to identify the households affected by the HIV/AIDS pandemic. Another challenge is differentiating the impacts of the disease where a household has suffered death of a member, or illness only or both. The advanced analysis in the study attempts to decompose the extent of the impacts based on these three categories.

1.6 Conceptual framework

FANRPAN adopted a model by Mano & Matshe (2003), which explains the dynamics of HIV and AIDS effects on the household where agriculture plays a significant role in the rural household livelihoods. The model is presented in Figure 1.1 below. The model illustrates a series of possible events that follow a prime-age death in a household where agriculture is a significant source of livelihood. After death of a household member due to HIV/AIDS, a combination of possible changes takes place in the household. These are: changes in capital asset base, investment choices, expenditure mix, optimal production choices and family labour size and dependency ratio. The last column in the figure further disaggregates these possible changes. The implications conceptually include having to contend with all of the surrounding factors implicated in HIV – development not only in a subsistence sense, but far beyond to the sustainability of the upcoming generation and to the society into which that generation shall enter.
Figure 1.1: HIV/AIDS impact on agriculture and food security: An analytical framework

1.7 Research Hypotheses

Based on the conceptual framework developed by Mano and Matshe 2003, the FANRPAN workshop in Botswana developed a set of hypotheses which the study was expected to test. The study was not able to test the full list of hypotheses developed by FANRPAN because of lack of sufficient information collected, and the general unavailability of data, particularly secondary data. This particular study modified and adopted the following hypotheses which are tested:

- **HIV/AIDS causes changes in the household demographic structure, reduces number of productive members and workdays and increases dependency ratios**
- **HIV and AIDS affects on farm crop mix, input application rates and of farm ventures.**
- **HIV and AIDS cause a loss of productive labour in the household which leads to low labour intensive cropping and poor crop management.**
- **HIV and AIDS reduces farm expenditure on household consumer goods and production inputs, whilst increasing expenditure on medical and health care goods.**
- **HIV and AIDS and related morbidity cause a decline in household livelihood assets (such as agricultural machinery) and capital stock (such as livestock)**

The importance of the agriculture sector to the South African economy, the significant prevalence rate of HIV/AIDS in the country as well as the potential of the pandemic to disrupt agriculture and other household economic activities makes this study necessary and essential for policy and technology development. The study contributes to the growing body of knowledge on the impact of the pandemic and attempts to fill in the gaps that exist in current knowledge on the topic. The next section of the report reviews the literature that is available on HIV/AIDS and agriculture and identifies the gaps in the existing knowledge which this study attempts to fill in.
SECTION TWO: LITERATURE REVIEW

2.1 Introduction
The HIV/AIDS pandemic presents, perhaps, the greatest challenge to global efforts to attain development in the Third World, as it threatens to reverse the gains made towards human development over the past decades. The potential damage of the pandemic becomes considerably worse in regions such as sub-Saharan Africa that are still recovering from natural disasters ranging from floods, droughts and pest infestations, that have occurred in the last decade. Whilst considerable effort has been made in ensuring that vulnerability of households in sub-Saharan Africa to drought and consequently food insecurity is minimized, these efforts need to be revisited in light of the ramification so of the HIV/AIDS pandemic. Rural development programmes and efforts have had to take new dimensions as it has become necessary to integrate HIV/AIDS in the design of interventions to address poverty. Similarly, small-scale agriculture has had to adapt to the various challenges and constraints to productivity that are a result of the pandemic.

2.2 Impact of HIV and AIDS on the Agricultural Sector
Research into the socio-economic impact of HIV/AIDS on households and communities is crucial in guiding policies and interventions (Booysen et al, 2001). The primary impact of HIV/AIDS manifests mainly among individuals and households. An assessment of the socio-economic impact of HIV/AIDS should start on this micro-level and include determining how HIV/AIDS affects the economic decisions and position of individuals and households over time, and how this affects their quality of life. To date, no truly comprehensive, longitudinal study of this nature has been conducted in South Africa.

Households affected by HIV predictably had a higher burden of morbidity and death. People in affected households were four times as likely to have been ill in the previous month, and to have had an infectious disease. Affected households on average included two more ill persons than unaffected households. Ill people in affected households had
more severe illness, indicated by hospital admission, not recovering and inability to perform daily tasks. Of affected households 20% had experienced a death in the previous six months, compared to 1% of unaffected households.

Based on demographic projections in Southern and Eastern African countries where HIV prevalence is highest (exceeding 10 percent)\(^1\) (US Census Bureau, 2003, cited by Jayne, Villarreal, Pingali & Hemrich, 2004), HIV and AIDS are likely to have the following effects on the agricultural sector:

- Increased rural inequality as a result of disproportionately severe effects of AIDS on relatively poor households;
- A reduction in household assets and wealth, leading to less capital-intensive cropping systems for severely affected communities and households; and
- Problems in transferring knowledge of crop husbandry and marketing to the succeeding generation of farmers.

Jayne, et al., 2004, order the effects of HIV and AIDS on agriculture in the rural household (and, by implication, on household food security) according to three categories namely, (1) effects on agricultural production and productivity, (2) effects on crop cultivation and production systems, and (3) effects on land distribution.

### 2.2.1 Effects on agricultural production and productivity

Studies conducted in Africa in the late 1990’s found that rural households suffering mortality of a prime-age adult generally experienced a decline in agricultural production relative to non-affected households. Statistically, this result was significant in the cases where the head of the household was male (citing Yamano & Jayne, 2004). Other studies conducted in Eastern Africa showed that affected household members were able to partially compensate for the death of a household member by bringing back another member residing off the farm. This would partially stabilise the supply of agricultural labour to the household, although this happened at the expense of off-farm remittances.

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\(^{1}\) These include Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia and Zimbabwe (where prevalence exceeds 20 percent), and Malawi and Mozambique (where prevalence exceeds 10 percent).
and therefore put pressure on household capital endowments (Ainsworth, Ghosh & Semali, 1995; Sewanlambo, 1998). As expected, the effects of the pandemic on households that were initially poor were most severe (citing Drimie, 2002; Knodel & Imem, 2002; Yamano & Jayne, 2004).

2.2.2 Effects on crop cultivation and production systems

Some studies reviewed by Jayne, et al., 2004, have documented a trend whereby a change in production systems (from commercial to subsistence crops) has occurred possibly due to HIV and AIDS. The explanation of this phenomenon is based on observations that suggest that capital constraints would become more severe as HIV and AIDS affect households, forcing many affected households to adopt less capital-intensive technologies and crops. The results have, however, been mixed as to how the pandemic is affecting household agricultural systems.

According to Booysen 2001, most households with ill or dying members carried a burden of caring. Of ill people 75% required someone to care for them at home, while 68% required someone to accompany them during health care visits. Relatively few carers lost income as a result. Few carers came from outside the household (7% among cases of illness and 5% among fatal cases).

Affected households were more dependent on non-employment sources of income than non-affected households (primarily government grants). Affected households allocated more of their resources to food, health care and rent, and less to education, clothing, personal items and durables. Affected households also spent less on food - between 70% and 80% of the expenditure in non-affected households.
2.2.3 Effects on land distribution

According to Jayne, et al., 2004, as affected households lose members in the prime of age, including those possessing rights to their household land, conflicts over inheritance may occur (citing Barnett & Blakie, 1992). Poor, disadvantaged and vulnerable households (consisting of orphans and widows) are particularly more susceptible to losing access and/or ownership rights after the husband or father passes away. In such a scenario, land ownership will tend to be more concentrated in wealthier households (those who are able to maintain their land rights after experiencing a prime-age death) in the long term (see also Drimie, 2003).

Concentration of land among wealthier households due to HIV and AIDS is a phenomenon that is predicted to occur economy-wide in many countries (citing Lehutso-Phooko & Naidoo, 2002). The negative implication is that already disadvantaged households are becoming more disadvantaged. However, a positive outcome could be that the concentration of land in wealthy hands, or cooperative agrarian endeavours might protect land from being parcelled out and also allow knowledge management and sustainability of both subsistence and productive agriculture.

2.2.4 HIV/AIDS and income and expenditure

The study by Booysen et al 2001, also shows that the income burden was generally more severe in the semi-rural area of QwaQwa than in the urban area of Welkom. Rural location and lower income aggravated the disease burden. The risk of death in QwaQwa was twice as high as in Welkom, while probability of recent illness was marginally higher. Other predictors of morbidity outcomes included lower household income, age, higher education levels and employment status. The greater likelihood of deaths among households with a higher proportion of female members suggests indirectly that female household members were more likely to die.

The mean costly of health care among ill household members during their last episode was estimated to be R98 while the mean cost of health care for household members who
died was estimated to be R167. Among households affected by deaths, funeral costs were substantially higher than health care costs. The median cost of funeral expenses was R4000 - 5000 per death. Relatively few households reported lost income due to illness or death. However, this may reflect chronically ill or dying people having been unemployed for some time.

The most frequent responses of households to financial crises seem to be borrowing, followed by using savings and sale of assets. Coping financially in these ways was also more likely in rural than in urban areas, given that rural areas are generally poorer. Very few households experiencing a recent death had received a lump-sum payment or inheritance following the death, underscoring the few means poor households have to cope with the effect of a recent death.

2.3 South African AIDS Policy Review and Agriculture

According to Dorrington et al (2002) demographic and statistical analysis indicates that Republic of South Africa (RSA) has yet to see the full impact of the HIV/AIDS epidemic. He projects an increase in the total number of AIDS sick people from 591,088 in 2003 to 1,049 million after 3 years. Concurrently AIDS deaths are expected to surge from 987,061 (2003) to 2,387 in 2006. This is partly due to an eight to nine year lag between HIV infection and the onset of AIDS. During this period most patients exhibit few if any symptoms yet the virus is potent enough to be spread knowingly or otherwise.

The National Department of Agriculture (NDA) policy on HIV is derived from the national programme that is the HIV/AIDS/STD Strategic Plan for South Africa 2000-2005. Although the NDA contributed to composing this policy document, the main authors of were the departments of Health, Justice and Constitutional Development, Labour and Social Development.

According to the HIV/AIDS strategic plan the government plans to involve each ministry in the fight against AIDS. Towards achieving this each of these ministries will have a
focal person and team whose responsibility will be to plan, budget, implement and monitor HIV/AIDS interventions (Government of SA, 2000. pp12). However the Ministry of Health is the focal point of all other ministerial efforts to combat the disease.

The Department of Agriculture has also been involved in the dissemination of information about the pandemic to its stakeholders through *Infor Paks* compiled and distributed by its Directorate Agricultural Communication Services. Publications on HIV/AIDS and the farming community include:

- HIV/AIDS and the farming community—nutrition
- HIV/AIDS and nutrition
- HIV/AIDS and the farming community—caring for people with HIV/AIDS (all languages)
- HIV/AIDS and the farming community—know your rights (all languages)
- HIV/AIDS and the farming community—stay healthy (all languages)
- HIV/AIDS and the farming community—what women should know (all languages)
- HIV/AIDS what the farming community should know (all languages)

(Directorate Agricultural Information Services 2003)

2.5 Gaps in knowledge

In South Africa, research into the impact of HIV and AIDS on development is still at a pioneering stage. The only notable contributions to the empirical body of knowledge on HIV and AIDS impact on agricultural issues in South Africa are by Drimie (2003) and various other related work by the Human Sciences Research Council (HSRC). Clearly, much knowledge is still to be amassed regarding the impact of this epidemic on agriculture, food security and livelihoods in South Africa. Most of the empirical analysis on HIV/AIDS and agriculture has been gender based and descriptive in nature. There is a dearth of literature that quantifies the impacts of the pandemic, and compares the impacts according to whether a household has suffered death only, illness only or both.
Other gaps in knowledge pertain to the lack of longitudinal studies that enable more meaningful impact assessment to be conducted. This study attempts to fill in the gaps by quantifying the impacts of the pandemic, disaggregating households according to their vulnerability indexes as well as providing baseline information for longitudinal studies to be carried out in future.
SECTION THREE: METHODOLOGY OF THE STUDY

3.1 The Study Area

Although the methodology followed in the execution of this study followed general methodological guidelines prepared by FANRPAN for the benefit of the country teams of researchers (FANRPAN, 2003), the budget and time constraints as well as logistical and sampling problems arising from the sheer size of South Africa, all influenced the final choice of methodology used. In the end, the South African research team opted for a case study approach in Limpopo Province.

The selection of Limpopo Province as a case study area was guided by several considerations. Limpopo province is amongst the poorest provinces in South Africa, with more than 40% of the household in the province suffering from some form of food insecurity, either transitory or chronic. About 89% of Limpopo province can be classified as rural, agriculture plays a major role in the development of the province, providing employment and food security to the population. The unemployment rate in the province is about 42 percent (Nesamvuni A, Oni S, Odhiambo J and Nthakheni N, 2003).

Capricorn, one of the six district municipalities in the Limpopo Province, was selected for the carrying out of this case study. It was chosen due to established networks between the University of Limpopo, the Limpopo Department of Agriculture, and surrounding communities, which played a role in facilitating access to the sample. The Capricorn District has five local municipalities, namely Aganang, Blouberg, Lepelle, Molemolle and Polokwane, with a total of 106 wards.

The study was conducted in the Molepo area in Capricorn District, Limpopo Province and this site was selected purposively. The reason for selecting Molepo was that it is amongst the poorest areas in the district with a large share of the population involved in subsistence agriculture and it has one of the highest prevalence rates of HIV/AIDS in the
province. The village was therefore selected for assessing the impact of HIV/AIDS on agriculture production and food security, to examine the changes in decision making as a result of HIV/AIDS or related illness such as TB and Pneumonia within households and to identify the coping strategies adopted by HIV/AIDS affected households.

Ga-Molepo is a rural community situated South West of Polokwane, about 30km away from the University of Limpopo. The road network in the area is average, although public transport is a major problem for the residents of the area. The area has a small clinic situated close to Tshebela village. The clinic refers people needing anti-retroviral treatment to Mankweng Clinic and Pietersburg Clinic. The area has a few grocery stores, which are under stocked, and several primary and high schools.

### 3.2 Sampling procedure

Up to seven villages were covered in the survey and three villages participated in the focus group discussions and the community seminars. The key contact person in the community was the head nurse at Ga-Molepo clinic who played a pivotal role in all phases of the study. She introduced the research team to the members of the Molepo Home Based Care and Counselling Centre (MHBGC&CC). The home based care group assisted by introducing the team to the local traditional authorities at the onset of the study and also arranged meetings for the focus group discussions. During the survey they assisted the team with information regarding households that were suffering from illness and deaths of household members resulting from HIV/AIDS related illnesses.

Households from the seven villages of Molepo (i.e. sampling units in the sample frame) were stratified according to ‘affected’ and ‘non-affected’ and then randomly selected from the different strata. The definition of affected households used by the survey includes households in which at least one family member who is chronically ill due to or related to HIV/AIDS, or in which at least one family member has been lost to HIV/AIDS or HIV/AIDS related chronic illness (such as TB and Pneumonia) in the last three years. Non-affected households are households in which no member has died of, or is living
with, HIV/AIDS related diseases. A higher probability of selection (0.6) was given to the affected households (both death- and illness-affected) and a lower probability (0.4) to the non-affected ones in order to give more relevance to impact. The targeted sample size was 300 households. Due to logistical problems and resource constraints only 250 households were interviewed, and data on 218 households were used for analyses. More questionnaires from the affected group were rejected at the analyses stage because of poor responses. This is a common problem in HIV/AIDS related researches since people in many societies associate the disease with stigma and they are reluctant to discuss it.

### 3.3 Data collection

The data for the survey were collected through a quantitative method at the household level and community seminars and focus group discussions. The focus group discussions were held with the community and HIV/AIDS support groups and were guided by a list of questions addressing the main issues of the survey.

The survey consisted of a questionnaire, which covered data on

- demographic profile, such as list of household members including age, sex, educational level, marital status, occupation and relation to household head,
- health, such as illness in the household, type of medical treatments for the sick member, recent deaths (during the previous three years), the amount of money spent due to these incidences and how these incidences affected the household,
- agricultural and livestock production, such as cultivated land area, total planted area in 2003 and 2004 crop seasons, land currently not utilised, agricultural inputs, crop outputs, quantities of fertiliser and seed used, ownership of land and changes in animal types,
- food security, such as food availability and access to food support,
- labour, such as labour input, contribution to cropping and livestock activities prior and during sickness, number of hours per day spent by the caregiver, sources of labour for cropping, gardening and herding livestock, and use of hired labour,
- socio-economic characteristics, such as household income and expenditure, change in income and expenditure due to illness or death of household member,
disposal method for the assets left behind by recently deceased adult household member, and

- roles of government and NGOs, such as preventing sickness and deaths, helping orphans, supporting agricultural activities for affected families and making sure deceased ‘s children get enough food.

Fifteen enumerators, eleven from the School of Agriculture postgraduate program, University of Limpopo and four local Home Based Care workers, with reasonable competence in both English and Sepedi (Northern Sotho) were recruited for the fieldwork. The enumerators were trained and supervised by the researchers on the sampling procedure, interview techniques, interpretation and comprehension of questions, recording of responses, the participatory tools used for the group discussions and other logistics.

Prior to conducting the actual fieldwork, the draft questionnaire was pre-tested in ten households (five in the affected and five in the non-affected) to check on clarity, validity, correct understanding and translation of the questions. Discussions were held with the enumerators after the pre-testing to discuss problems encountered, and improvements were made to the questionnaires. The questionnaires were in English and the enumerators were required to translate the individual questions into Sepedi for the interviewee. The quantitative part of the survey was administrated over a period of one and a half weeks followed by qualitative data collection from the focus group discussions and community seminars.

### 3.4 Data Analysis

The completed questionnaires were checked by the researchers for errors such as omissions and questions not answered correctly. The questionnaires with such errors were returned to enumerators for rectification and further the enumerators were sent to the field for clarification when necessary. Trained clerical assistants were captured the data in Statistical Package for Social Sciences (SPSS) Version 13. The coding of
variables in the questionnaires before capturing and cleaning of the captured data were done by the researchers.

Different statistical methods were used to analyze the data. First, basic analysis such as frequencies, cross-tabulations and descriptive statistics were used to summarize the data collected. Then in the advanced analysis, one-way analysis of variance, multiple linear regression and principal component analyses were used to study the effects of HIV/AIDS and related diseases on agricultural production and food security of households. Households affected by HIV/AIDS and related diseases illnesses, i.e. chronic diseases such as TB and Pneumonia (morbidity), households affected by deaths as a result of HIV/AIDS or chronic illnesses and non-affected households were used as proxies for the advanced analysis.

### 3.4.1 Multiple Regression Analysis

A multiple regression model uses to describe the statistical relationship between two or more predictor (explanatory) variables and a response (dependent) variable. The model can be stated as follows:

\[
Y_i = \beta_0 + \sum_{j=1}^{k} \beta_j X_{ij} + \epsilon_i, \quad i = 1, \ldots, N
\]

(3.1)

where

- \(Y_i\) is the value of the response variable for the \(i^{th}\) household,
- \(\beta_0, \beta_1, \ldots, \beta_k\) are parameters,
- \(X_{i1}, X_{i2}, \ldots, X_{ik}\) are known constants, namely, the values of the predictor variables, and
- \(\epsilon_i\) is a random error term with mean \(E(\epsilon_i) = 0\) and variance \(Var(\epsilon_i) = \sigma^2\); \(\epsilon_i\) and \(\epsilon_{i'}\) are uncorrelated so that their covariance is zero, for all \(i \neq i'\).
The general linear regression model (3.1) encompasses not only quantitative variables but also qualitative ones, such as gender (male, female). We use indicator variables that take on the values 0 and 1 to identify the classes of a qualitative variable. For example, we define gender of the household head as

\[ X_{ij} = \begin{cases} 
1, & \text{if the household head is male} \\
0, & \text{if the household head is female}. 
\end{cases} \]

In general, we represent a qualitative variable with \( p \) classes by means of \((p - 1)\) indicator variables.

### 3.4.2 Principal Component Analysis

We used principal components to determine the weights for an index of the asset variables, i.e. to calculate the wealth index. Principal components analysis is a technique for extracting from a set of variables those few orthogonal linear combinations of the variables that capture the common information most successfully. Intuitively the first principal component of a set of variables is the linear index of all the variables that captures the largest amount of information that is common to all of the variables.

Suppose we have a set of \( k \) variables, \( y_{ij} \), to \( y_{kj} \), representing the ownership of \( k \) assets by each household \( j \). Principal components analysis starts by specifying each variable normalized by its mean and standard deviation: for example,

\[ z_{ij} = \frac{y_{ij} - \bar{y}_i}{s_i} \]

where \( \bar{y}_i \) is the mean of \( y_{ij} \) across households and \( s_i \) is its standard deviation. These selected variables are expressed as linear combinations of a set of underlying components for each household \( j \):

\[
\begin{align*}
  z_{ij} &= a_{i1}P_{1j} + a_{i2}P_{2j} + \cdots + a_{ik}P_{kj} \\
  &\vdots \\
  z_{kj} &= a_{k1}P_{1j} + a_{k2}P_{2j} + \cdots + a_{kk}P_{kj}
\end{align*}
\]  

(3.2)
where the $P_j$’s, $j=1,\ldots,m$, are the components and the $a_{ij}$ are the coefficients on each component for each variable and do not vary across households. The first principal components $P_{ij}$ is computed as the linear combination of the original variables with maximum variance and the second one is also a linear combination of the variables, orthogonal to the first, with maximal remaining variance, and so on (Johnson, 1998). The principal components are recovered by inverting the system implied by (3.2) and yield a set of estimates for each of the $k$ principal components. The first principal component, expressed in terms of the original variables, is therefore an index for each household based on the expression

$$P_{ij} = l_{i1}\left(\frac{y_{ij} - \bar{y}_1}{s_1}\right) + \ldots + l_{ik}\left(\frac{y_{ik} - \bar{y}_k}{s_k}\right)$$

where $l_{ij}$ is the loading of the $j$th variable for the first principal component and obtained by using $l_{ij} = a_{ij}\sqrt{\lambda_1}$, $\lambda_1$ is the variance of the first principal component. The crucial assumption for our analysis was that household long-run wealth explains the maximum variance and or covariance in the asset variables.

### 3.4.3 Household Vulnerability Index Calculation

In line with the proposed methodology by FANRPAN, a Household Vulnerability Index (HVI) is calculated to establish the different levels of vulnerability that the impact of HIV/AIDS on Agriculture and food security has introduced in the households studied. The different Household Vulnerability Indices (HVI) reflects different degrees of vulnerability. Three levels of vulnerability are used to enable recommendations on the streamlining of policy responses:

1) **Vulnerability level 1 = Coping level Households (CLH)** – a household in a vulnerable situation but still able to cope

2) **Vulnerability level 2 = Acute level households (ALH)** – a household that has been hit so had that it badly needs 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
3) Vulnerability level 3 = Emergency level Households (ELH) – the equivalent of an intensive care situation – almost a point of no return – but could be resuscitated only with the best possible expertise.

The resulting indices make it possible to determine the percentage of households falling under each category from the study sample. The index serves as a useful tool to for developing social response measures, as well as, government social protection policy for vulnerable households under different categories of vulnerability. The steps followed in calculating the household vulnerability indices are as follows;

(a) Choosing variables used to construct the HVI- The choice of variables was guided by existing literature on the extent to which different variables affect vulnerability of households to HIV/AIDS (See Annex 1).

(b) Developing a system of weights for the variables selected- This was also based on literature (see FANRPAN, 2005)

(c) Grouping the variables selected for calculating the HVI into a separate spreadsheet in Excel.

(d) "Normalising" the selected variables by setting an appropriate scale so that each variable falls between 0 and 1 (see Annex 1).

(e) Applying the weights to the normalised data.

(f) Sum the weighted scores and set on a scale of 0 to 100.

(g) Grouping the households into the above three vulnerability groups.

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2 For a detailed explanation of the steps in calculating the HVI see FANRPAN, 2005a. ‘Study on The Impact of HIV and AIDS on Agriculture and Food Security SADC Region covering 7 Countries: Botswana, Lesotho, Namibia, Swaziland, South Africa, Zambia and Zimbabwe Regional Methodological Framework’ and FANRPAN 2005b ‘Quantifying the Impact of HIV and AIDS on Household Level Agriculture and Food Security: The Household Vulnerability Index (HVI)’. Regional Thematic Policy Brief No: 1
SECTION FOUR: RESEARCH FINDINGS: DESCRIPTIVE STATISTICS

4.1 Introduction

The findings discussed in this section of the report emanate from a household survey conducted in the Molepo area of Limpopo Province as well as focus group discussions and community seminars held in the same area. The main aim of the survey was to gather information and data which would assist in testing the various hypotheses earlier developed in the study by the FANRPAN regional team. This study attempts to assess the impact of the HIV/AIDS scourge by comparing the ‘with’ and ‘without’ situations. Due to the time frame of the study the impacts can not be assessed over a long time i.e. adopt the ‘before’ and ‘after’ approach, but rather the data in the study will serve as baseline data for further impact analysis.

The focus for now is on cross sectional analysis on the basis of the status of the households at a particular point in time. The major limitation with this approach is that the impacts of the pandemic will not be the same for all households that are affected, the impacts will depend on other factors such as the stage of illness of the household member, the member of the household who is ill i.e. is it the main breadwinner who is suffering from HIV/AIDS related illnesses or is it another household member. Further the actual impact will also depend on the economic status of the particular household before the onset of the illness, overriding factors such as poverty may influence the impacts of the disease on households; some households will be more vulnerable than others to the impacts of the pandemic. In some instances the overriding factors can result in minimal differences between the affected and non affected households.

The households which were interviewed in the survey were for the purposes of the study classified into four main groups (see Figure 4.1 and Table 4.1);
households with one or more members suffering from HIV/AIDS related illnesses (morbidity)

- households which have lost one or more member due to HIV/AIDS related illnesses (mortality)

- households which have suffered from both death and illness of an adult member (hybrid)

- households which have not directly suffered loss or illness due to HIV/AIDS

![Graph showing percentage of households with recent death (mortality), Chronically ill (Morbidity) & Hybrid members between 16 and 59 years]

**Figure 4.1** Percentage of Households with recent death (mortality), Chronically ill (Morbidity) & Hybrid members between 16 and 59 years

**Table 4.1** Classification of households in the study

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of households</th>
<th>% of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Affected households</td>
<td>118</td>
<td>54.1</td>
</tr>
<tr>
<td>Households with ill member (Morbidity)</td>
<td>54</td>
<td>24.8</td>
</tr>
<tr>
<td>Households which have experienced death of member (Mortality)</td>
<td>10</td>
<td>4.6</td>
</tr>
<tr>
<td>Households which have experienced both death of member and illness (hybrid)</td>
<td>36</td>
<td>16.5</td>
</tr>
<tr>
<td>Total number of households in survey</td>
<td>218</td>
<td>100</td>
</tr>
</tbody>
</table>

*Source: Survey data 2005*
Analysing the study using the mortality and morbidity indicators for HIV/AIDS, the results indicate that on average, about 23 percent of the sampled households had their members between 16 and 59 years of age in the Molepo area died of HIV/AIDS related illnesses and about 40 percent are suffering from the same illnesses. The hybrid indicator for HIV/AIDS shows that about 16 percent of the households have their members between 16 and 59 years of age suffering from or died of HIV/AIDS or related illnesses.

For the purpose of the preliminary analysis, the first, second and third groups of households fall within the ‘affected households’ or ‘with’ category, whilst the third group falls in the ‘non-affected households’ or ‘without category’. It is important to mention that this classification is only for distinction purposes, almost all households in rural areas are affected by the HIV/AIDS pandemic, some directly others indirectly. The indirect effects may include having to spend more time at funerals for households not directly affected, being called upon to provide social safety support systems.

The stigmatisation of the HIV/AIDS pandemic as well as the unwillingness of communities and individuals to talk about HIV/AIDS made it necessary for the research team to develop some proxies for key variables, as well as adopt several working definitions for the purpose of this study. Use of proxies as a way of determining a household’s HIV/AIDS status has various disadvantages, the main ones being that it may result in overestimation of the extent of the pandemic in the community. The household is the unit of analysis for the study, and it is defined as comprising people who farm on the same plot and eat from the same pot.

The preliminary analysis focused on the description of the demographic characteristics of the households in the study, their access to agriculture assets and resources, household expenditure and income. The discussions largely make comparisons of these between the two categories of ‘affected’ and ‘non affected’ previously defined. Lastly the coping strategies adopted by the household in the study are discussed. The advanced analysis in the next section further breaks down the affected households to determine the impacts
where a household has suffered from death only, illness only or both (Table 4.1). The different hypotheses earlier developed are also tested.

4.2 Demographic Characteristics of Households

The impacts of the HIV/AIDS pandemic on households often vary depending on the sex of the household head, with female headed and child headed households often being more vulnerable. The ability of the household to adjust to shocks associated with HIV/AIDS depends on the structure of the household, whilst on the other hand the pandemic has resulted in changing structure of the households in rural areas. As a result of HIV/AIDS more and more households are being headed by females in rural areas, and this has implications for agriculture as well as total income for the household, as men are often able to get employment off the farm and have better access to job opportunities. In this study, a greater proportion of the affected households (53%) are headed by females in comparison to 46% of the non-affected households (see Figure 4.2).

![Sex of household head across categories](image.png)

**Figure 4.2  Sex of household head across categories**

The pandemic has also resulted in changing household structures, and the study sought to find out the household structures prevalent in the area and the differences in household structure between the affected and non-affected households. There are some differences

29
in terms of the type of household prevalent under each of the two categories of households.

Table 4.3  Distribution of family structure across categories

<table>
<thead>
<tr>
<th>Category of household</th>
<th>Affected n=100</th>
<th>Non affected n=118</th>
<th>Total n=218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both parents available</td>
<td>40.0</td>
<td>45.7</td>
<td>43.3</td>
</tr>
<tr>
<td>Father available, mother works elsewhere</td>
<td>0.0</td>
<td>0.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Mother available, father works elsewhere</td>
<td>12.9</td>
<td>17.2</td>
<td>15.4</td>
</tr>
<tr>
<td>Head never married</td>
<td>4.7</td>
<td>8.6</td>
<td>7.0</td>
</tr>
<tr>
<td>Child-headed (Orphan)</td>
<td>2.4</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Widow</td>
<td>28.2</td>
<td>23.3</td>
<td>25.4</td>
</tr>
<tr>
<td>Widower</td>
<td>7.1</td>
<td>2.6</td>
<td>4.5</td>
</tr>
<tr>
<td>Other</td>
<td>4.7</td>
<td>1.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

Households headed by parents who are resident in the household, are dominant in the study area, although the affected households have slightly less number of households headed by both parents (46%) compared to the non-affected with 40% (table 4.2). The affected households have more households headed by either widows or widowers in comparison with the non-affected households. A few affected households (2.4%) are headed by orphans.

Table 4.3 shows that the average age of the household head is higher by a small margin for affected households, than non-affected households. It was observed during the study that affected households normally get integrated into households of grandparents after the death of the breadwinner. The mean household size also appears to be larger for affected households (7.36 persons) than for non affected households (6.62). The number of children that are under 16 years is also more for affected households than non-affected households (Table 4.3).
Table 4.3  Age of head, family size and dependency ratio of households

<table>
<thead>
<tr>
<th>Variable</th>
<th>Affected=100</th>
<th>Non-affected hhs n=118</th>
<th>Total population n=218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age of household head in years</td>
<td>61.7</td>
<td>60.63</td>
<td>61.2</td>
</tr>
<tr>
<td>Mean Household size</td>
<td>7.36</td>
<td>6.62</td>
<td>6.96</td>
</tr>
<tr>
<td>Number of children/Dependent in the household</td>
<td>4.90</td>
<td>4.31</td>
<td>4.58</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*

The frequent illness experienced by people suffering from HIV/AIDS related illnesses usually results in job losses and in cases where the head of the household is resident in the city; they end up having to come back to the rural areas to receive care from the family. Fewer of the affected households have a head that is in wage employment, whilst more are headed by persons in other employment (Figure 4.3). Self employment is also relatively higher among the affected households, which brings one to think that the flexibility associated with self employment may be ideal for people who are affected by HIV/AIDS for two main reason namely; the sick person can work when they feel able to do so without risking job losses, and those household members who are self employed can have a flexible schedule that allows for time to care for sick relatives. In this study however, fewer affected household heads seem to be spending time in child care and housework than the non-affected households. This may require further investigation.
Education plays a key role in determining a household’s economic status, which in turn influences the way a household ability to react to shocks. Where a household has alternative sources of income, or other investments in the form of assets before the onset of illness, it is expected that the impacts of HIV/AIDS will differ from a case where a household is already economically disadvantaged. Figure 4.4 shows that most of the affected households have heads educated up to primary level, whilst the non-affected households have more heads educated up to matric and diploma levels.
households are headed by males compared with non-affected households. The mean age of the household head is more than 60 years for both affected and non-affected households, whilst wage/salary employment is less common in affected households. Few of the households in both categories are educated beyond matric level.

4.3 Household Access to Land and Ownership of Agricultural and Non-Agricultural Assets

4.3.1 Ownership of Non-Agricultural Assets

During the focus group discussions participants were asked to indicate what measures of wealth were used by the community. It emerged from these discussions that indicators of wealth in the area, included the type and size of a person’s house, livestock numbers, ownership of car and ownership of businesses. Figure 4.5 shows that there are no differences in ownership of household assets between the affected and the non-affected households. Almost 50% of the households in the sample owned a television set and an even higher proportion owned a radio. This observation that most of the population owns a radio or TV or both presents an opportunity for HIV/AIDS awareness campaigns through the media.

![Figure 4.5: Household ownership of non-agricultural assets](image)

**Figure 4.5** Household ownership of non-agricultural assets
4.3.2 Livestock and Agricultural Asset Ownership

As stated earlier during the focus group discussions it emerged that the people in the Molepo area view livestock ownership as a wealth indicator. Apart from this, ownership of cattle in smallholder agriculture enhances agriculture production through use of the cattle as draft power as well as a source for manure. The study found out that there is no difference in terms of livestock ownership between the two groups of households (Table 4.4). This trend is observed for the agricultural implements as well (Table 4.5). The most commonly owned agricultural implement is a wheelbarrow whilst just about a tenth of both the affected and non affected households own ox drawn ploughs.

Table 4.4 Livestock ownership across household categories

<table>
<thead>
<tr>
<th>Type of livestock</th>
<th>Non affected n=118</th>
<th>Affected n=100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Cattle</td>
<td>1.84</td>
<td>1.86</td>
</tr>
<tr>
<td>Goats</td>
<td>2.50</td>
<td>2.29</td>
</tr>
<tr>
<td>Poultry</td>
<td>4.07</td>
<td>5.32</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

Table 4.5 Percentage of households with agricultural assets

<table>
<thead>
<tr>
<th>Asset type</th>
<th>Non affected %</th>
<th>Affected %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plough</td>
<td>11.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Pump</td>
<td>5.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Cultivator</td>
<td>5.9</td>
<td>7.0</td>
</tr>
<tr>
<td>Harrow</td>
<td>16.9</td>
<td>14.0</td>
</tr>
<tr>
<td>Wheelbarrow</td>
<td>70.3</td>
<td>66</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

4.3.3 Household Access and Utilization of Land

Most of the people in the study reported that they had user rights or Permission to Occupy (PTO) to the land that they were farming on. There does not seem to be any difference in terms of method of acquiring land between the affected and non-affected households. The study did not establish any changes in land ownership as a result of the HIV/AIDS pandemic. None of the households affected by HIV/AIDS reported that they
had lost land due to death of family member. Rather what was prevalent was that some of
the household stopped using some of its pieces of land after death of household members.

The mean size of land holding for the affected households is 2.17 hectares, whilst that for
the non-affected households is 2.37 hectares (Table 4.6). Almost a third (32.6%) of the
affected households, and a fifth (20%) of the non-affected households said they were not
utilizing all the land that they had for crop production (Figure 4.6). The reduction in
acreage under crop production is likely to impact on total agricultural production for
these households, and for the affected households this in turn affects the food security
status of the household.

![Figure 4.6 Percentage of households not utilizing all land they own](image)

<table>
<thead>
<tr>
<th>Category of household</th>
<th>Mean size of field in hectares</th>
<th>Mean size of land not being utilized in hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affected</td>
<td>2.17</td>
<td>1.30</td>
</tr>
<tr>
<td>Non affected</td>
<td>2.37</td>
<td>2.63</td>
</tr>
<tr>
<td>Total</td>
<td>2.28</td>
<td>1.86</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

Reasons given by the households in both categories for failing to use all of the available
land in the household included the following:

- Distance to field too far
• Insufficient funds to plough the land
• Insufficient rain
• Looking after ill person
• Illness of person responsible for farming
• No one is interested in using the land
• Old age and sickness
• Parents are working far so no sufficient labour
• The family can’t use it because the owner is dead
• They don’t have money and taking care of livestock
• Too busy to plough

It is important to note that most of the above reasons are related to situations that arise in households due to sickness or death of a household member.

4.4 Household Agricultural Activities

Agriculture is the main economic activity in most rural areas, and it impacts on household income, food security as well as household expenditure. All the households that participated in the survey were involved in agricultural activities, albeit at different levels.

4.4.1 Crops Grown By the Households

The most common crops grown in the study area are maize, sorghum and beans. Most of the households grow maize only whilst about a fifth of the affected households grow maize and sorghum (Table 4.7). During focus group discussions it was reported that some households had shifted from sorghum to maize production although they think sorghum is a quality grain. This happened more than five years ago and was caused by problems of birds which feed on the sorghum, rather than an HIV/AIDS coping strategy. In following up this issue we later found that some of the households would like to shift from maize back to sorghum because sorghum was a less demanding crop in terms of labour, but could not shift because of the problem of birds.
Table 4.7  Crops grown by the households in the 2003/04 season

<table>
<thead>
<tr>
<th>Type of crop</th>
<th>Affected % n=100</th>
<th>Non affected % n=118</th>
<th>Total % n=218</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maize</td>
<td>79.3</td>
<td>94.5</td>
<td>87.8</td>
</tr>
<tr>
<td>Maize and Sorghum</td>
<td>19.5</td>
<td>5.5</td>
<td>11.7</td>
</tr>
<tr>
<td>Beans</td>
<td>1.1</td>
<td>0.5</td>
<td>.5</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

The communities cited drought and lack of inputs as the major problems affecting agricultural productivity. During the focus group discussions all the communities agreed that indeed there has been a change in the general level of agriculture production over the past five years. Reasons given for the decline in agricultural production included the increased costs of inputs and frequent droughts.

In the interviewed households most of the decisions regarding planting, ploughing and marketing of agricultural crops were made by the household head. Where the head was not present in the household, then the spouse, if available made such decisions. Most of the families in the surveyed area (35.3%) received their inputs from relatives, either resident locally or elsewhere. In this case the inputs are given as remittances by non-resident household members, or relatives living nearby. About 34.2% of the households reported that they purchase the inputs from local shops which are within a radius of about 8 km, whilst some few households said they got their inputs from NGOs or government agents. About 16.6% of the households reported that they use recycled seed.

The households which were affected by death or illness of a household member were asked to rank the effects of illness on agriculture and general welfare of the households. Figure 4.7 shows that the most common impacts of illness include the loss of time that would otherwise be used for agriculture, off farm activities, and household chores. Sales of household property, farm assets or livestock do not seem to be prevalent although they have been experienced by some of the households.
Whilst few of the households report having to sell livestock (poultry specifically) to pay for medical bills or cater for household requirements during illness, about 95% of the households which experienced death had to slaughter a beast at the livestock. The most common animal slaughtered was an ox (88%), whilst 6% slaughtered a goat. Only 1.4% of the households reported loss of assets as a result of death. Table 4.8 shows that for most of the households in the area that have experienced death, the livestock was left for the deceased’s family, whilst clothes and utensils were in some instances shared amongst all present.

Table 4.8 Disposal method of household assets after death of member

<table>
<thead>
<tr>
<th>Assets remaining</th>
<th>Disposal method</th>
<th>% households</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Left for deceased family</td>
<td>87.5</td>
</tr>
<tr>
<td>Cattle</td>
<td>Shared amongst immediate family</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>Left for deceased family</td>
<td>93.3</td>
</tr>
<tr>
<td>Utensils</td>
<td>Shared amongst immediate family</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Shared amongst most present</td>
<td>3.3</td>
</tr>
<tr>
<td>Clothes</td>
<td>Left for deceased family</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>Shared amongst immediate family</td>
<td>20.0</td>
</tr>
<tr>
<td></td>
<td>Shared amongst most present</td>
<td>5.0</td>
</tr>
<tr>
<td>House, Land</td>
<td>Left for deceased family</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*
4.4.2 Household labour allocation

In the interviewed households most of the decisions regarding planting, ploughing and marketing of agricultural crops were made by the household head. Where the head was not present in the household, then the spouse, if available made such decisions. There seems to be differences in terms of labour allocation for different farming related chores between the affected and the non-affected households. Table 4.9 shows that in affected households the wives seem to spend less time in summer field cropping than in non affected households. Herding livestock is a chore that is done by men as well as children in the household, but more so for children in non-affected households. In households that are experiencing illness less women (31%) are responsible for gardening activities whilst in affected households this figure is higher (47%). Households’ engagement in gardening activities often contributes positively to food security and income generation.

Table 4.9 Household Labour allocation to different chores

<table>
<thead>
<tr>
<th>Chore</th>
<th>Husband</th>
<th>Wife</th>
<th>Child</th>
<th>Hired labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer field crop</td>
<td>Affected n=77</td>
<td>14.3</td>
<td>33.8</td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td>Non Affected n=110</td>
<td>14.5</td>
<td>42.7</td>
<td>14.5</td>
</tr>
<tr>
<td>Herding livestock</td>
<td>Affected n=38</td>
<td>31.6</td>
<td>18.4</td>
<td>26.3</td>
</tr>
<tr>
<td></td>
<td>Non Affected n=55</td>
<td>30.9</td>
<td>18.2</td>
<td>34.5</td>
</tr>
<tr>
<td>Gardening</td>
<td>Affected n=35</td>
<td>17.1</td>
<td>31.4</td>
<td>37.1</td>
</tr>
<tr>
<td></td>
<td>Non Affected n=62</td>
<td>16.1</td>
<td>46.8</td>
<td>30.6</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

Some of the surveyed households reported that they had hired labour to assist in farming at some point in time. Figure 4.8 shows that most of the households that reported hiring labour to assist in agriculture are not affected by HIV/AIDS. In chronically ill households, where labour shortage becomes serious, the shortage of financial resources may hinder the hiring of labour. In households that are not seriously affected by HIV/AIDS, hiring labour is a possible coping strategy for dealing with the reduced labour

3 The figures in the table do not add up to 100% because other categories of labour provided have not been included in the table
supply due to illness. The study found out however that a greater proportion of the households that hired labour were not affected by the pandemic. A possible explanation for this could be the fact that hiring labour requires money and often the affected households have other commitments which would render the hiring of extra labour not feasible.

![Figure 4.8 Households hiring labour by category](image)

### 4.5 Household Income and Expenditure

#### 4.5.1 Household Access to Social Grants

A higher percentage of the affected households (85%) receive social grants than the non affected households (68%) as shown in Figure 4.9. Social grants have provided safety nets for most poor households in rural areas and are also performing the same functions for those households affected by HIV/AIDS. Where children are left in the care of grandparents or otherwise after the death of parents, the old age, orphan and child grants are often the major source of income for most households. Table 4.10 shows the types of grants and the mean amounts received from these grants.
Figure 4.9  Percentage of households receiving grants

Table 4.10 shows that a greater proportion of the affected households (49%) receive the child grant than the non affected households (37.6%). The mean grant amount is also higher for the affected households than the non-affected households.

Table 4.10  Percentage of households receiving grants

<table>
<thead>
<tr>
<th>Households Receiving grant</th>
<th>Affected n=85</th>
<th>Non affected n=80</th>
<th>Total n=165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension %</td>
<td>65.9</td>
<td>75.0</td>
<td>70.3</td>
</tr>
<tr>
<td>Child %</td>
<td>50.0</td>
<td>60.0</td>
<td>55.2</td>
</tr>
<tr>
<td>Disability %</td>
<td>7.5</td>
<td>9.4</td>
<td>8.5</td>
</tr>
<tr>
<td>Mean grant income in R</td>
<td>R929.06</td>
<td>R922.78</td>
<td>R926.01</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

4.5.2 Household Income Sources

Apart from the social grants, other sources of income for the households include wage employment, casual employment, crop sales and remittances from non-resident household members. Few of the households in the area recorded poultry sales. Most of the households in the area did not participate on crop output markets (Table 4.11). Of those that did, interestingly, the affected households recorded higher crop sales than the
non-affected households. This number is however very small in comparison to the total households surveyed. The mean adult income for the affected households was lower than that for the non-affected household (Table 4.12).

<table>
<thead>
<tr>
<th>Table 4.11</th>
<th>Mean household income from crop sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of household</td>
<td>N</td>
</tr>
<tr>
<td>Crop sales</td>
<td>Not affected</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*

<table>
<thead>
<tr>
<th>Table 4.12</th>
<th>Mean household income per adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category of household</td>
<td>N</td>
</tr>
<tr>
<td>Adult income</td>
<td>Not affected</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*

### 4.5.2 Household Expenditure

When a household suffers from illness the household expenditure pattern normally changes. Households affected by HIV/AIDS are expected to spend more on medical expenses, and in some instances the money to finance medical expenses is diverted from other household responsibilities such as school fees and related expenditure, fertiliser and other agricultural inputs as well as money that would normally be used to finance acquisition of household assets. When household expenditure on agricultural input declines this is normally reflected in reduced application rates for fertilizers, as well as less use of hybrid or purchased seed. Figure 4.10 shows that mean fertilizer application rates amongst the surveyed households. Both affected and non affected households used basal fertilizers, the top dressing (also known as LAN) was also used in the area, but mostly by non-affected households.
Figure 4.10     Fertilizer application rates

Table 4.13 shows that the overall household expenditure for affected households per month is much higher than that incurred in non affected households. Affected households also spend considerably more money renting farm machinery than non-affected households. Transport costs for affected households are however less for affected households than non-affected households. This may be because the incidence of HIV/AIDS reduces mobility of household members as they spend time looking after the sick. As expected health expenditure for affected households is higher than for non-affected households.
### Table 4.13 Household expenditure summary

<table>
<thead>
<tr>
<th>EXPENDITURE TYPE</th>
<th>CATEGORY OF HOUSEHOLD</th>
<th>N</th>
<th>MEAN per Year</th>
<th>Standard error of the mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petrol/oil</td>
<td>Not affected</td>
<td>116</td>
<td>517.3</td>
<td>121.4</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>100</td>
<td>732.9</td>
<td>258.1</td>
</tr>
<tr>
<td>Electricity</td>
<td>Not affected</td>
<td>116</td>
<td>502.7</td>
<td>94.6</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>99</td>
<td>185.5</td>
<td>37.8</td>
</tr>
<tr>
<td>Food</td>
<td>Not affected</td>
<td>118</td>
<td>4538.0</td>
<td>217.6</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>98</td>
<td>4078.0</td>
<td>250.2</td>
</tr>
<tr>
<td>Clothing</td>
<td>Not affected</td>
<td>114</td>
<td>1235.5</td>
<td>197.0</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>96</td>
<td>722.6</td>
<td>127.3</td>
</tr>
<tr>
<td>Transport</td>
<td>Not affected</td>
<td>116</td>
<td>695.7</td>
<td>119.5</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>99</td>
<td>507.2</td>
<td>95.5</td>
</tr>
<tr>
<td>Medical</td>
<td>Not affected</td>
<td>118</td>
<td>306.5</td>
<td>75.1</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>100</td>
<td>1655.0</td>
<td>198.9</td>
</tr>
<tr>
<td>School fees and books</td>
<td>Not affected</td>
<td>116</td>
<td>761.1</td>
<td>144.2</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>99</td>
<td>539.7</td>
<td>98.4</td>
</tr>
<tr>
<td>Vehicle costs</td>
<td>Not affected</td>
<td>116</td>
<td>341.8</td>
<td>221.9</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>96</td>
<td>21.8</td>
<td>12.4</td>
</tr>
<tr>
<td>Insurance</td>
<td>Not affected</td>
<td>116</td>
<td>113.4</td>
<td>56.9</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>97</td>
<td>243.6</td>
<td>128.6</td>
</tr>
<tr>
<td>Savings</td>
<td>Not affected</td>
<td>116</td>
<td>139.5</td>
<td>55.1</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>96</td>
<td>40.1</td>
<td>21.5</td>
</tr>
<tr>
<td>Religious and burial societies</td>
<td>Not affected</td>
<td>116</td>
<td>72.4</td>
<td>13.7</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>96</td>
<td>128.7</td>
<td>49.6</td>
</tr>
<tr>
<td>Average monthly expenditure</td>
<td>Not affected</td>
<td>117</td>
<td>986.9</td>
<td>68.9</td>
</tr>
<tr>
<td></td>
<td>Affected</td>
<td>84</td>
<td>1082.3</td>
<td>132.0</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*

### 4.6 Household Membership of Clubs and Organisations

Membership to local organisations and clubs often enables a household to have greater access to agricultural production and marketing information as well as assistance in times of needs. However, the incidence of HIV/AIDS in the household often leaves the household with less or no time to attend the club meetings, whilst in some instances the household will isolate itself due to the stigmatisation of HIV/AIDS. The study found that

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*This is the only monthly figure in the table*
a greater percentage of the people who were members of the clubs or organisations in the area were from the non-affected households (Figure 4.11).

![Pie chart showing percentage of households participating in local clubs or organizations.](image)

**Figure 4.11** Percentage of households participating in local clubs or organizations

### 4.7 Summary

The descriptive section above has shown that there are differences in demographic characteristics of affected households and non-affected households. Elderly and female headed households are fairly common in the area. Most of the household heads in Ga-Molepo only received primary education, few studied up to matric level. The mean household size for affected households is slightly higher than that for non-affected households. The number of dependents in affected households is also higher than for non-affected households. Wage employment is not very common in the area, and more members of non-affected households are in wage employment than non-affected households.

Crops grown in the area include maize, sorghum and beans. There were noted changes in terms of crop mix although these changes could not be specifically pinned down to the incidence of HIV/AIDS in the household. Labour shortage and shortage of funds to purchase inputs are some of the reasons that are given by households for not utilizing all of the available land. The affected households cited reduced labour allocation to agriculture as one of the impacts of illness on agriculture production. There were no confirmed incidences of livestock or any other asset sales to pay for medical expenditure.
Affected households spend more of their income on medical expenditure, and consume less food than non-affected households on average. Very few of the households in the area participate in output markets. It seems most of the households only produce for home consumption and did not realize any surplus for sale in the 2003/04 season. Major sources of income for most households are the social grants received from government as well as remittances from non-resident household members.

The next section of the report discusses the results of the regression analysis, analysis of variance as well as vulnerability indices.
SECTION FIVE: ADVANCED DATA ANALYSIS

5.1 Introduction

This section of the report presents the results of the advanced data analysis that was carried out, and also the results of the tests of the hypotheses earlier stated. Various statistical methods were used to compare practices and performances among households affected by HIV/AIDS or related diseases only, households affected by death of household head or adults member due to HIV/AIDS or related diseases, and non-affected households. The result of vulnerability index is presented.

First, analysis of variance was used to compare average cultivated land area, total labour input in terms of number of hours lost as a result of chronic illness and death, value of purchased agricultural inputs used, and labour inputs were compared among three household groups – those not affected by HIV/AIDS or related diseases or death, those affected by HIV/AIDS or related diseases within the previous two crop seasons, and those affected by death within the previous three years. Death-affected households were those in which a household member died within the previous three years as a result of HIV/AIDS or related diseases, including those that also suffered by HIV/AIDS or related diseases during the past two cropping seasons. Deaths not associated with HIV/AIDS or related diseases, such as Malaria, Asthma and accidents, were not included. Second, multiple linear regression analysis was carried out to ascertain whether the estimated effects varied with gender, age or status of the victims or dependency ratio.

The survey was able to collect information to test the following hypothesis which will be used to assess the impact HIV/AIDS on the key areas of agriculture, food security and natural resources.

- HIV/AIDS causes changes in the household demographic structure, reduces number of productive members and workdays and increases dependency ratios
- HIV and AIDS affects on farm crop mix, input application rates and of farm ventures.
- **HIV and AIDS cause a loss of productive labour in the household which leads to low labour intensive cropping and poor crop management.**
- **HIV and AIDS reduces farm expenditure on household consumer goods and production inputs, whilst increasing expenditure on medical and health care goods.**
- **HIV and AIDS and related morbidity cause a decline in household livelihood assets (such as agricultural machinery) and capital stock (such as livestock)**

### 5.2 Dependency ratio

The dependency ratio can be used as a proxy to indicate the demographic squeeze caused by HIV/AIDS (SADC FANR, 2003). This works in two ways; first by decreasing active adults, and second by increasing dependents, for example, when the household takes in orphans and the sick household member unable to work. Proxy variables are seen to have a stronger effects on agricultural production and food security. The dependency ratio is calculated on the number of dependents those under 16 and older than 59 years divided by the total household size. The dependency ratios were divided into four categories to facilitate qualitative comparisons between male-and female-headed households: ‘low’ (where ratio between 0 and 0.33, inclusive), ‘moderate’ (where ratio between 0.34 and 0.66, inclusive), high (where ratio between 0.67 and 0.99, inclusive) and ‘extremely high’ (where ratio equals 1). Figure 5.1 shows the differences in dependency ratios according to gender of the household head. Male-headed households tended to have a ‘low’ or ‘moderate’ dependency ratio, while female-headed households were likely to have ‘high’ or ‘extremely high’ dependency ratios. This analysis shows the disproportionate burden women bear in stressed households.
The age of the head of the households also affects trends in dependency ratios. The dependency ratio among female headed households was about 15 percent higher in households headed by an elderly person (Figure 5.2).

Figure 5.1  Dependency Ratio by Gender of Household Head

Figure 5.2  Dependency Ratio among Age Groups of Female Households
5.3 The effects of HIV/AIDS and related diseases on agricultural production

5.3.1 Labour losses

Households reported various ways in which labour was lost as a result of chronic illnesses and death. Of the interviewed households, 70 percent of them responded that taking care of an ill person means spending less time in other activities. It was found that losses were experienced through days when victims were bedridden, when the household members took care of the victims and hours that were spent on the victim’s funeral. There were also instances where household members took care of sick relatives and attended other relatives’ funerals. The study revealed that the households lost an average of 3.23 (n = 218) hours per day, with death-affected households losing an average of 7.13 (n = 46), illness-affected households losing 6.24 (n = 54) and non-affected households losing 0.34 (n = 118) hours per day. Table 5.1 below presents household labour losses due to HIV/AIDS or related chronic illnesses and deaths during the year 2004.

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households</th>
<th>Mean number of hours</th>
<th>Standard error of mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>6.24</td>
<td>0.31</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>7.13</td>
<td>0.50</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>0.34</td>
<td>0.11</td>
</tr>
<tr>
<td>Total labour loss</td>
<td>218</td>
<td>3.23</td>
<td>0.26</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

The statistical test on overall difference of mean hours lost per day among the household categories showed that there is a significant difference at 5 percent level. Furthermore, the Post-Hoc Multiple comparison results with least significant differences (LSD) showed that the mean loss of hours per day by illness- and death-affected households were significantly different from non-affected and also each other.
5.3.2 Purchased agricultural inputs

The means of total agricultural input applied during last cropping season were compared among household categories using one-way ANOVA. The mean value of purchased inputs (seed and fertilizers) used during last crop season was found to be Rand 107, 135 and 195 among the death-affected, illness-affected and non-affected households respectively (Table 5.2). The over all mean differences among the household categories were found to be highly significant (P-value = 0.009). The Post Hoc Multiple comparison results using LSD indicated that the mean value of purchased input used by the two proxy groups, death- and illness-affected ones were significantly different from the non-affected group, but not from each other (P-value = 0.430). Compared with non-affected households, death-affected and the illness-affected ones spent 45% and 60% less respectively on purchased agricultural inputs. This could be attributed to the fact that the affected households diverted income that would have been used to purchase farm inputs to pay for medical bills and other related expenses.

Table 5.2 Mean value of purchased agricultural inputs used by households in year 2004

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households (n)</th>
<th>Mean value of inputs (Rand)</th>
<th>Standard error of mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>135.28</td>
<td>18.10</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>106.85</td>
<td>13.08</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>194.94</td>
<td>20.18</td>
</tr>
<tr>
<td>All households</td>
<td>218</td>
<td>161.57</td>
<td>12.36</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

5.3.3 Labour input

The means of total amount of household labour input applied during the cropping period of year 2004 were compared among the three household categories using one-way ANOVA. The means for total labour applied in farming were 7.30, 7.87 and 8.55 hours per day for death-affected, illness-affected and non-affected households respectively. It was found that the over all means labour input differences among the household
categories were statistically highly significant (P-value < 0.01). The Post-Hoc Multiple comparison results using LSD indicated that the means labour input for the two proxy groups, death- and illness-affected ones were significantly different from the non-affected group, but not from each other (P-value = 0.148). However, as it can be seen in Table 5.3, the means labour input for the household categories were all approximately equal to the normal person working hours (8 hours). This implies that even with the observed labour losses due to illnesses and deaths, the total amount of labour applied to agriculture remained constant. This agrees with the observation made during the focus discussion that held between the researchers and the communities (i.e. qualitative methods), where when a household member dies or falls ill, neighbours and relatives come in to assist in farming activities for the affected households.

Table 5.3  Labour input (hours per day) used in cropping period of year 2004

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households (n)</th>
<th>Mean labour input (hours per day)</th>
<th>Standard error of mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>7.87</td>
<td>0.25</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>7.30</td>
<td>0.23</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>8.55</td>
<td>0.19</td>
</tr>
<tr>
<td>All households</td>
<td>218</td>
<td>8.12</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

5.3.4  Labour input cultivated land area
The area of cultivated land for a given household was examined using the difference in total area planted from one year to the next year (i.e. between years 2003 and 2004). The results in Table 5.4 illustrate that the non-affected households cultivated on average 0.025 ha more area in 2004 than the previous year, while households affected by death and illness cultivated on average 0.45 and 0.17 ha less area in 2004 than the previous year, respectively. The statistical tests showed that the effects of HIV/AIDS and related illness incidences on area of cultivated land in the study area were highly significant (P-value < 0.01).
Table 5.4  Mean difference of cultivated land area of year 2004 and 2003 (in ha)

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households (n)</th>
<th>Mean difference of cultivated land (Ha)</th>
<th>Standard error of mean (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>-0.173</td>
<td>0.074</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>-0.446</td>
<td>0.140</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>0.025</td>
<td>0.046</td>
</tr>
<tr>
<td>All households</td>
<td>218</td>
<td>-0.102</td>
<td>0.426</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

Table 5.5 presents the estimated cultivated areas for the household categories. The cultivated fields of the death-affected and illness-affected households were 37.3% and 33.0% smaller than the non-affected households, respectively. The overall differences among household categories were found to be highly significant (P-value = 0.004). The Post Hoc Multiple comparison results using LSD indicated that the means cultivated land area for the two proxy groups, death- and illness-affected ones were significantly different from the non-affected group, but not from each other (P-value = 0.780).

Table 5.5  Mean cultivated land area (ha)

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households (n)</th>
<th>Mean cultivated area (ha)</th>
<th>Standard error of mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>1.103</td>
<td>0.114</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>1.060</td>
<td>0.111</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>1.433</td>
<td>0.067</td>
</tr>
<tr>
<td>All households</td>
<td>218</td>
<td>1.273</td>
<td>0.053</td>
</tr>
</tbody>
</table>
5.3.5 Maize production

The means of maize harvested (in tones) during last cropping season (2004/2005) were compared among household categories using one-way ANOVA. The mean value of maize harvested during this crop season was found to be tones 0.362, 0.414 and 0.487 among the death-affected, illness-affected and non-affected households respectively (Table 5.6). The overall mean differences among the household categories were found to be statistically non-significant (P-value = 0.360).

<table>
<thead>
<tr>
<th>Household category</th>
<th>Number of households (n)</th>
<th>Mean maize harvested (tones)</th>
<th>Standard error of mean (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>54</td>
<td>0.414</td>
<td>0.073</td>
</tr>
<tr>
<td>Death-affected</td>
<td>46</td>
<td>0.362</td>
<td>0.171</td>
</tr>
<tr>
<td>Non-affected</td>
<td>118</td>
<td>0.487</td>
<td>0.206</td>
</tr>
<tr>
<td>All households</td>
<td>218</td>
<td>0.453</td>
<td>0.130</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

5.3.6 Regression analysis - Cultivated land area, value of purchased inputs and labour input

The multiple linear regression analysis was used to estimate the magnitude of the effects of illnesses and deaths on the total cultivated land area, value of purchased inputs and labour input. The results indicated that the effect on total cultivated land area when households suffered at least a death was highly significant and higher, i.e. a decline of 0.37 ha, than when they suffered illness only, i.e. a decline of 0.33 ha. On amounts of purchased inputs used, households affected by chronic illnesses were experienced a decline of purchased inputs used valued about Rand 48 compared to Rand 66 decline in the death-affected households. Similarly, households that suffered illnesses only and death experienced a reduction in labour input of 0.68 and 1.25 hours, respectively (see Table 5.7). These relationships were statistically significant.
Table 5.7  Effects of chronic illness and deaths on cultivated land area, value purchased inputs and labour input

<table>
<thead>
<tr>
<th>Household category</th>
<th>Cultivated land area (ha)</th>
<th>Value of purchased input (Rand)</th>
<th>Labour input (hours per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.433 (0.070)</td>
<td>172.957**(10.968)</td>
<td>8.55**(0.179)</td>
</tr>
<tr>
<td>Illness-affected</td>
<td>-0.330** (0.126)</td>
<td>-47.863*(19.585)</td>
<td>-0.680*(0.319)</td>
</tr>
<tr>
<td>Death-affected</td>
<td>-0.373** (0.133)</td>
<td>-66.109** (20.583)</td>
<td>-1.46** (0.338)</td>
</tr>
</tbody>
</table>

* Significant at 5 percent  ** Significant at 1 percent
NB: The numbers in parentheses are standard errors of mean.

Source: Survey data, 2005

5.4 Effects of illnesses and deaths by household characteristics

5.4.1 Gender of victim

In Table 5.7, it was observed that the cultivated land area, value of purchased input and labour input of the households for the study area were affected by chronic illness and deaths. However, when the effects of chronic illnesses and deaths by gender were examined on the same variables; results somehow differed from those reported in the above section where both incidences had significant effects on the three variables. Only two variables, male illness and female illnesses, significantly affected cultivated land area. The cultivated land area for households that suffered male illness and/or female illnesses had declined about 0.325 ha and 0.338 ha, respectively (Table 5.8)).

While total chronic illness and deaths had significant effects on total purchased input use regardless of gender of the victim (see Table 5.7), further analysis indicated that when disaggregated with gender, the effect of chronic illness was not statistically significant (Table 5.8). However, results suggested that households that suffered female illnesses had reductions in purchased input. Unexpectedly, it was found that households experiencing male illness had an increase in purchased input however it was not statistically significant. Observe also that the amount of the two incidences effects on households...
purchased input were small when disaggregated by gender even though the death effect was significant.

Of the factors examined, only male deaths had a significant effect on labour input. This result may be attributable to the fact that in the communities studied, it is the males who are more responsible than females for the farm activities. It is, therefore, their deaths would lead to the observed decline in the labour input.

Table 5.8 Gender differentiated effects of chronic illness and deaths on cultivated land area, value purchased inputs and labour input

<table>
<thead>
<tr>
<th>Household category</th>
<th>Cultivated land area (ha)</th>
<th>Value of purchased input (Rand)</th>
<th>Labour input (hours per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.441**(0.064)</td>
<td>2.246**(0.028)</td>
<td>8.523**(0.164)</td>
</tr>
<tr>
<td>Male illness</td>
<td>-0.325*(0.151)</td>
<td>0.023 (0.068)</td>
<td>-0.411 (0.387)</td>
</tr>
<tr>
<td>Female illness</td>
<td>-0.338*(0.138)</td>
<td>-0.043 (0.062)</td>
<td>-0.697 (0.353)</td>
</tr>
<tr>
<td>Male deaths</td>
<td>-0.288 (0.151)</td>
<td>-0.174**(0.065)</td>
<td>-1.174**(0.386)</td>
</tr>
<tr>
<td>Female deaths</td>
<td>-0.178 (0.142)</td>
<td>-0.203**(0.063)</td>
<td>-0.442 (0.364)</td>
</tr>
</tbody>
</table>

* Significant at 5 percent  ** Significant at 1 percent  
NB: The numbers in parentheses are standard errors of mean.

5.4.2 Age of the victim

The ordinary least square results for the effects of chronic illnesses and deaths by age of victims were presented in Table 5.9. The cultivated land area decreased when an adult died or experienced a long illness, and when a child was ill. However, only the result for adult illness was statistically significant. It was found that where there were long illnesses without a death, child illnesses affected cultivation activities more than adult illnesses and adult deaths. When effects of chronic illness and deaths on purchased inputs were examined by age, only the result for adult deaths was statistically significant. However, the results show that the purchased input of households was declined due to long illness of a child (see Table 5.9). This decline is experienced since the households spent money to pay medical bills for sick child. Unexpectedly, it was found that households
experiencing adult illnesses had an increase in purchased input. This might suggest that households with sick adult members tend to draw more attention from agriculture extension workers or neighbours or relatives for agricultural inputs. The variations of effects of chronic illness and deaths by age of victim on labour input were found to be statistically significant only for adult deaths. Where there were long illnesses without death, child illnesses affected labour input more than adult illnesses.

Table 5.9  **Age differentiated effects of chronic illness and deaths on cultivated land area, value purchased inputs and labour input**

<table>
<thead>
<tr>
<th>Household category</th>
<th>Cultivated land area (ha)</th>
<th>Value of purchased input (Rand)</th>
<th>Labour input (hours per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.420**(0.064)</td>
<td>2.224**(0.027)</td>
<td>8.461**(0.170)</td>
</tr>
<tr>
<td>Child illness</td>
<td>-0.478 (0.271)</td>
<td>-0.131 (0.145)</td>
<td>-0.820 (0.720)</td>
</tr>
<tr>
<td>Adult illness</td>
<td>-0.405*(0.121)</td>
<td>0.023 (0.052)</td>
<td>-0.490 (0.320)</td>
</tr>
<tr>
<td>Child deaths</td>
<td>-0.300 (0.740)</td>
<td>0.174 (0.285)</td>
<td>1.539 (1.966)</td>
</tr>
<tr>
<td>Adult deaths</td>
<td>-0.206 (0.117)</td>
<td>-0.201* (0.049)</td>
<td>-0.825** (0.311)</td>
</tr>
</tbody>
</table>

* Significant at 5 percent    ** Significant at 1 percent

NB: The numbers in parentheses are standard errors of mean.

*Source: Survey data, 2005*

5.5  **Impacts of HIV/AIDS and related diseases on household income and expenditures**

This section examines the impacts of HIV/AIDS proxy variables on household incomes and expenditures which directly effect household access to food. There are a number of ways in which the HIV/AIDS epidemic could affect the household economy: the epidemic may reduce the labour supply leading to reduced productivity (see the previous section), the epidemic may also divert the household income from food to medical and funeral expenditures leading to food shortage and children may be taken out of school for financial reasons. One-way analysis of variance and regression analysis were used to study the impacts of the proxy variables on household income and household expenditures.
5.5.1 Average household income

The regression analysis results indicated that households affected by the HIV/AIDS and related chronic illnesses experienced a decrease in their off-farm average income but the effects were not statistically significant. The average household off-farm income is positively related with dependency ratio. The reason for this positive relationship is that households with a higher dependency ratio are more likely to earn Government Grants (see Table 5.10). Note that income from on-farm activities is excluded in the analysis since most of the households were consumed their agricultural products.

Table 5.10 Effects of HIV/AIDS proxies on average household off-farm income

<table>
<thead>
<tr>
<th>HIV/AIDS Proxy present in household</th>
<th>Regression coefficient</th>
<th>Standard error of coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>-0.719</td>
<td>28.243</td>
</tr>
<tr>
<td>Death-affected</td>
<td>-39.070</td>
<td>29.681</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>363.488**</td>
<td>61.698</td>
</tr>
<tr>
<td>(Constant)</td>
<td>100.435**</td>
<td>31.191</td>
</tr>
</tbody>
</table>

** Significant at 1 percent

Source: Survey data, 2005

5.5.2 Medical and funeral expenses, Expenditure on food and education

The interviewed households incurred different medical and funeral expenses. It was found that the mean expenditure per household per year on medical and funeral expenses was Rand 925 (n = 218). However, when disaggregated by proxy categories, the costs were Rand 2290 (n = 46), Rand 1114 (n = 54) and Rand 306 (n = 118) for the death-affected, illness-only affected and non-affected groups respectively. The mean expenditure on food per household per year were Rand 3955, Rand 4179 and Rand 4538 for the death-affected, illness-affected and the non-affected households respectively. The mean expenditure on education per household per year were Rand 440, Rand 623 and Rand 761 for the death-affected, illness-affected and the non-affected households respectively. The results of one-way analysis of variance (ANOVA) indicated that the
differences of mean medical and funeral expenses among the proxy categories were highly significant. It was also observed that the difference of mean expenses between any two categories statistically highly significant at 1 percent level. The mean expenditures on food and education were however found not to be statistically significant. Table 5.11 presents the mean medical and funeral expenses, food and education expenditures incurred by households during the last year. It was observed that non-affected households also contributed money to medical and funeral expenses of non-household members.

Table 5.11 Mean expenditures of household per year (Year 2004)

<table>
<thead>
<tr>
<th>Type of medical expenses</th>
<th>Mean medical expenses</th>
<th>Mean food expenditure</th>
<th>Mean education expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death-affected</td>
<td>2290 (244)</td>
<td>3955 (373)</td>
<td>440 (111)</td>
</tr>
<tr>
<td>Illness-only affected</td>
<td>1114 (286)</td>
<td>4179 (340)</td>
<td>623 (155)</td>
</tr>
<tr>
<td>Non-affected</td>
<td>306 (75)</td>
<td>4538 (218)</td>
<td>761 (144)</td>
</tr>
<tr>
<td>All households</td>
<td>925 (109)</td>
<td>4329 (165)</td>
<td>659 (90)</td>
</tr>
</tbody>
</table>

Source: Survey data, 2005

The ordinary least squares regression analysis results indicated that households affected by the HIV/AIDS and related chronic illnesses experienced a decline in their food and education expenditures for all proxy categories but these declines were not statistically significant (see Table 5.12). The average household off-farm income is positively related with dependency ratio. The combined effect of reduced incomes and increased expenditures on medical and funeral may results in less access to food.
**Table 5.12 Effects of HIV/AIDS proxies on average household expenditures**

<table>
<thead>
<tr>
<th>HIV/AIDS Proxy present in household</th>
<th>Regression coefficient</th>
<th>Standard error of coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical and funeral expenses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness-affected</td>
<td>620.310</td>
<td>166.305</td>
</tr>
<tr>
<td>Death-affected</td>
<td>2041.654**</td>
<td>174.841</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>41.621</td>
<td>345.169</td>
</tr>
<tr>
<td>(Constant)</td>
<td>229.263</td>
<td>178.105</td>
</tr>
<tr>
<td><strong>Food expenditure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness-affected</td>
<td>-209.746</td>
<td>365.128</td>
</tr>
<tr>
<td>Death-affected</td>
<td>-620.561</td>
<td>395.690</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-36.222</td>
<td>765.685</td>
</tr>
<tr>
<td>(Constant)</td>
<td>4404.470**</td>
<td>391.844</td>
</tr>
<tr>
<td><strong>Education expenditure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness-affected</td>
<td>-86.549</td>
<td>123.733</td>
</tr>
<tr>
<td>Death-affected</td>
<td>-80.648</td>
<td>130.151</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-482.734</td>
<td>256.465</td>
</tr>
<tr>
<td>(Constant)</td>
<td>740.784**</td>
<td>132.497</td>
</tr>
</tbody>
</table>

* * Significant at 5 percent  ** Significant at 1 percent

*Source: Survey data, 2005*

### 5.6 Impacts on Food Security

Food intake ratio was calculated for maize, as a proxy indicator for food security. The multiple linear regression analysis was used to see the impact of HIV/AIDS and related chronic illnesses, dependency ratio and wealth index on food intake. The results indicated that the effects on food intake when households suffered at least a death was highly significant and higher (decline of 0.166) than when they suffered illness only (decline of 0.098). Table 5.13 shows that vulnerable households, particularly illness-affected and deaths-affected households are less food-secured. This finding supports the general hypothesis that HIV/AIDS affected households are more likely to be food insecure. The
positive impact on food security associated with increased dependency ratio could be related to the increased in average household income because of government grant. The result in Table 5.13 however showed that the food intake of households in the study area was independent of the wealth index.

<table>
<thead>
<tr>
<th>Explanatory variables</th>
<th>Regression coefficient</th>
<th>Standard error of coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illness-affected</td>
<td>-0.098**</td>
<td>0.033</td>
</tr>
<tr>
<td>Death-affected</td>
<td>-0.166**</td>
<td>0.035</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>0.252**</td>
<td>0.068</td>
</tr>
<tr>
<td>Wealth index</td>
<td>0.000</td>
<td>0.014</td>
</tr>
<tr>
<td>(Constant)</td>
<td>0.732 ***</td>
<td>0.035</td>
</tr>
</tbody>
</table>

** Significant at 1 percent

*Source: Survey data, 2005*

### 5.7 Household Vulnerability Analysis

According to FANRPAN, 2005b, ‘Vulnerability is often described as having two components: “external vulnerability”, which refers to exposure to shocks or hazards; and “internal vulnerability”, which refers to the capacity to cope with or withstand those shocks. The vulnerability context refers to the ways that external shocks and trends affect asset levels. All of these factors determine the livelihood strategies that people pursue, and ultimately their livelihood outcomes (including income levels and food security).’ Household vulnerability is the extent to which HIV/AIDS and other factors affect a household’s food security status, and the household’s ability or inability to withstand the shock caused by these factors.

Literature shows that HIV/AIDS often increases the vulnerability of households to food insecurity because it affects the core factors of production in the household i.e. labour, capital and land. Once a household member falls sick, this entails a reduction in the labour supply to agriculture as well as the household’s participation on the labour market. Further resources are diverted from agriculture inputs to paying for medical expenses and
funeral costs, and lastly some households have to sell livestock, household assets and other livelihood assets to pay for medical bills as well as funeral costs. Female headed and child headed households also risk loosing their land after death of a male household head (FAO, 1996; Drimie 2003; Mutangadura and Mukuruzita 1999; FANRPAN 2003).

Household vulnerability indices show the extent of the impact of HIV/AIDS and other related factors on agriculture and food security. The Household Vulnerability Indices calculated in this study established the level of vulnerability to food insecurity that HIV/AIDS and related factors have introduced in each of the households in the study. Different HVIs reflect the different levels of vulnerability for the households. The aggregated levels of vulnerability used in the analysis are;

1. **Coping Households** (CHH) – a household in vulnerable situation but still able to cope
2. **Acute Level households** (ALH) – a household that has been hit so hard that it badly needs assistance to the degree of an acute health care unit in hospital. With some rapid-response type of assistance the family may be resuscitated.
3. **Emergency Level Households** (ELH) – the equivalent of an intensive care situation – almost a point of no return – but could be resuscitated only with the best possible expertise

<table>
<thead>
<tr>
<th>HVI level</th>
<th>HVI Range</th>
<th>Situation of Household</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerability Level 1</td>
<td>0.0 – 33.3%</td>
<td><strong>Coping Households</strong> (CHH)</td>
<td>63</td>
<td>28.9</td>
</tr>
<tr>
<td>Vulnerability Level 2</td>
<td>33.4 – 66.7%</td>
<td><strong>Acute Level households</strong> (ALH)</td>
<td>153</td>
<td>70.2</td>
</tr>
<tr>
<td>Vulnerability Level 3</td>
<td>66.8 –100%</td>
<td><strong>Emergency Level Households</strong> (ELH)</td>
<td>2</td>
<td>0.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>218</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Source: Survey data, 2005*

Table 5.14 shows that about 70.2% of the households surveyed are in acute level two, whilst 28.9% of the households are classified as coping households. A very small percentage of the households, (0.9%) fall under the emergency level category. The
households in the coping category are those households in a vulnerable situation but still able to cope.

It is rather surprising that despite the existence of social grants the majority of the households fall under the acute levels of vulnerability, where they have been badly hit and are suffering from food insecurity. Possible explanations for this are that as explained earlier the study area is one of the poorest areas in Limpopo, and despite agriculture being practiced in the area, maize yields are extremely low and farmers are only practicing dryland agriculture. The agriculture production data collected and used in the study were based on the year 2004/05 where the incidence of drought had resulted in poor agriculture production outputs. Unemployment levels in the area and Limpopo Province in general are also high. Further, as the study found out few of these households have cattle. These factors alone contribute towards transitory and chronic household food insecurity, and the HIV/AIDS pandemic further exacerbates a household’s vulnerability to food insecurity.

Since households exhibit different levels of vulnerability to food insecurity it means that there is a need for differentiated policy responses according to different types of households. Current efforts by government, community groups and other civil society organizations may improve the situation for the majority of the households in the area who fall under the acute levels of vulnerability. The next section discusses the coping strategies that have been adopted by households to cope with the effects of the HIV/AIDS pandemic.

5.8 Coping Strategies used by Households to Cope with Sickness and Mortality

Households and communities affected by the HIV/AIDS pandemic often devise means of coping with the pandemic itself and the associated problems. Households have to find ways of maintain productivity levels with the reduced household labour supply, and also maintaining household consumption levels in the face of increasing medical expenditure. Communities also have to deal with the increasing number of deaths as well as the
increasing numbers of orphans due to the pandemic. Studying these coping strategies can provide useful information for policy makers, as well as practitioners in the area of HIV/AIDS and rural development. The coping strategies that some households adopt are useful experiences that can be adopted by other households affected by the pandemic.

5.8.1 Hiring extra labour to help with the agriculture activities

Some of the affected households reported that they hire extra labour to cope with the reduced labour supply due to illness of household members and the time spent caring for sick members. Hiring of labour works where the household has sufficient funds to allocate towards labour hiring, but in most instances there are competing needs such as medical expenses, specialized food purchases and other household expenses for the limited income. Where the sick person is the breadwinner in the household then the ability of the household to hire extra labour is also reduced. Where possible, households pay for the extra labour in kind rather than in cash. Children have also been increasingly called upon to assist with household chores and agricultural activities in affected households.

5.8.2 Seeking remittances from relatives elsewhere

The study found that remittances from non-resident household members and relatives often contribute towards total household income and food security. Again this strategy will only work for those households that have relatives and members that are working and able to earn an income. With the increasing rate of unemployment, this coping strategy may not be sustainable in the long run.

5.8.3 Food parcels

The Social Welfare Department has been helping a lot of affected households to cope through the distribution of food parcels. The food parcels are distributed monthly to needy families and orphaned children and have the following contents; 80kg maize meal, 2kg sugar, 500g tea, Matches and candles, 3 large tins fish, Powdered milk, Samp, Juice
(powder), 2kg powder soap, 2 bars soap. Through the home based care group, this programme is able to include affected households amongst the beneficiary households.

5.8.4 Seeking assistance of the home based care group

The home based care group works closely with the local clinic as well as the district hospital at Mankweng.

The group currently provides the following services to members of the community;

- Visit patients regularly to ensure that they take their medicines as required.
- Provide information to the household members on how to take care of the patients.
- Look after the affected people who live alone at their house, for example preparing food for them, bathing them and etc.
- Provide information to the learners about the STI (sexually transmitted infections), how to prevent teenage pregnancy and breast cancer (women are the target group).

Although some of the affected households were not receptive to the home based care group members, other households are grateful for the support offered and mentioned the group as having helped them cope particularly during illness of a household member. We also noted that the traditional authority recognizes the role played by this group and is very receptive to the members. The lack of transport is a major problem for the home based carers when they travel from one household to another, bathing the sick, giving them medication, feeding them and ensuring that they are taken to hospital when they need to.

5.8.5 Seeking social grants

The pension grants, the orphan/foster care grants and the child grant are sources of the much needed income for both affected and non-affected households in the area. In most houses this is the only source of regular income. The government offers the disability grant for people suffering from HIV/AIDS but none of the households we came across
have been accessing this grant. The home based care group explained that it is difficult to advice households to apply for this grant because few of the affected households actually disclose that some members are suffering from HIV/AIDS. The lack of information may also be another reason that households are not able to access and utilize the grant.

Households in the study area adopt a variety of coping strategies to deal with sickness/morbidity. What we find most interesting is the fact that beyond the extended family there seems to be very little support offered to these households by the other community members. The traditional structures of support may be ineffective due to the stigma attached to HIV/AIDS, and lack of knowledge about the disease in rural areas. Clearly there is a need to put in place programmes that disseminate information on HIV/AIDS and implement awareness campaigns to enable the traditional support structures to be able to deal with the pandemic, whilst a person is still sick, rather than only offering support of funerals.
SECTION SIX: SUMMARY AND CONCLUSIONS

The findings in the study have concurred with previous studies done elsewhere, but have also failed to prove certain assertions made with regards to the impacts of HIV/AIDS on agriculture and food security. The study has also brought new insights into the impacts of the pandemic on agriculture, particular in terms of contributing to the quantitative information regarding the relationship of various variables pertaining to agriculture production, food security and HIV/AIDS.

6.1 Impacts of HIV/AIDS on household demographic structure, labour supply and dependency ratios

The study found out that there are differences in terms of the mean age of the household, with affected households being headed by on average more elderly household heads than non-affected households. Female headed households are common, and less than half of the households are headed by both parents who are resident at the household. Female headed households have higher dependency ratios than male headed households. Households headed by elderly people (i.e. head above 60 years of age) have relatively higher dependency burdens than households headed by persons under 60 years. This may be partly caused by the fact that the elderly have old age pensions which result in them looking after their sick children as well as grandchildren. Regarding labour supply, it was found that where there were long illnesses without a death, child illnesses affected cultivation activities more than adult illnesses and adult deaths. It was found that losses were experienced through days when victims were bedridden, when the household members took care of the victims and hours that were spent on the victim’s funeral. There were also instances where household members took care of sick relatives and attended other relatives’ funerals. There is significant evidence that the HIV/AIDS pandemic affects household dependency ratios, changes household demographic structures and reduces labour supply to various household activities.
6.2 HIV and AIDS impacts on farm crop mix, input application rates and off farm ventures

The mean value of purchased input used by death- and illness-affected households were significantly different from the non-affected group, but not from each other. Compared with non-affected households, death-affected and the illness-affected ones spent less on purchased agricultural inputs. This could be attributed to the fact that the affected households diverted income that would have been used to purchase farm inputs to pay for medical bills and other related expenses.

Minimal changes were observed in crop mix, with some households shifting from sorghum to maize production. The study failed to prove that the changes in crop mix were due to the impacts of illness or death in the household. Affected households were found to cultivate smaller areas than non-affected households. Non-affected households had increased the land area under cultivation in 2004 than 2003, whilst affected households had actually experienced a decline in cultivated land area.

The study could not establish whether there were significant differences in participation in off farm ventures between the affected and non-affected households, but given that affected households suffered labour losses one can deduce that this will impact on the ability of the household to engage in off farm activities.

6.3 HIV and AIDS impacts on productive labour leading to low labour intensive cropping and poor crop management

Households affected by illness face a problem of labour supply for agriculture and make up for this by hiring extra labour. Most of this labour is paid in kind. The cultivated land area decreased when an adult died or experienced a long illness, and when a child was ill. Households that suffered death lose more labour hours on average than those that have ill members. The non-affected households do not lose much labour hours due to illness. However, even with the observed labour losses due to illnesses and deaths, the total amount of labour applied to agriculture remained constant. Because of the low
participation in output markets of both affected and non-affected households, we cannot with certainty conclude that households do change their agricultural production activities. The reason that there is no significant change in the structure and level of agriculture production may be because in these communities the level of agriculture production was already so low that it may not be necessary to scale down when a member of the household gets sick. There may be need for further investigation to explain the insignificant change of labour input into agriculture despite the reduction in total household supply as a result of illness.

6.4 HIV and AIDS impacts on farm expenditure, household consumer goods and medical and health care goods

Food security is a function of household’s production levels as well as the ability of the household to earn income and allocate that income towards purchase of food for all members. Affected households incurred higher medical expenses than non-affected households, whilst the food expenditure was higher for non-affected households. Households affected by the HIV/AIDS and related chronic illnesses experienced a decline in their food and education expenditures. The combined effect of reduced incomes and increased expenditures on medical and funeral may result in less access to food. Effects of HIV/AIDS on food security were found to be much higher for households that have experienced death than those that experience illness only. The government grants are significantly contributing to households’ food security status, even in the face of illness. The study failed to establish a relationship between food intake and a household’s wealth index.

6.5 HIV and AIDS impacts on household livelihood assets and capital stock

Because there were no households that reported sale of livestock and farming implements, as well as other household assets such as furniture there was no data to conduct an analysis to test this hypothesis. Both affected and non-affected households did not record any livestock and asset sales, and in this regard we conclude that there is no evidence from this study that households affected by HIV/AIDS resort to sale of
livestock as a coping strategy. This may require further investigation in light of contrary findings that have been made elsewhere.

6.6 HIV/AIDS and the Household Vulnerability Index

Most of the households in the study fall under the acute level households which have been hit hard by HIV/AIDS and other factors resulting in the household being vulnerable to food insecurity. These households need some rapid response and can still be resuscitated. What is perhaps encouraging is that a small percentage of the households fall under the emergency level household where there are almost beyond rescue in terms of resuscitating their economic standing.

6.7 Concluding remarks

Food insecurity is a major concern for people who are in the rural areas, and the HIV/AIDS pandemic brings new complexities in the fight to attain food security for all. Agriculture has an important role to contribute in the fight against HIV/AIDS and in realizing food security for all households, but it seems rural households have not been able to realize the maximum potential of agriculture. Developing agriculture and empowering communities through development projects that are gender and HIV/AIDS sensitive will go a long way in poverty alleviation and fighting HIV/AIDS. There is clearly need for information dissemination, and programmes that help to change the perceptions of rural communities regarding HIV/AIDS. Affected people need to be educated that in disclosing their status they stand to benefit from the government AIDS grant and they may also get assistance from other community members. Formation of home based care groups may help in de-stigmatizing HIV/AIDS and in building up community structures for dealing with the pandemic. There are possibilities for employment creation through training and paying local home based care groups in rural communities.
SECTION SEVEN: POLICY RECOMMENDATIONS

South Africa is still reeling from the consequences of past constraints in agriculture, consisting of a substantial schism between commercial production and subsistence farming, and the HIV/AIDS pandemic has further threatened production and food security. This is in large part due to new pressures, imperilling the commercial sector, which has historically dominated South Africa’s agricultural output with loss of knowledge, capacity, innovation and investment, and shrinking subsistence survival, resulting in a real threat of food insecurity. Therefore the key to addressing food insecurity and low incomes from agriculture lies in attacking one of its most lethal challengers, HIV/AIDS. Understanding both food security and HIV/AIDS can allow for effective intervention to mitigate both food insecurity and the impact of HIV/AIDS, and opportunity to procure development and dignity, and to provide security and sanctity in and beyond South Africa.

It is first at the household level that HIV/AIDS is threatening food security. Strategies to deal with food insecurity must address the challenges posed by HIV/AIDS as well as declining agriculture productivity levels. Government, particularly departments of health and social development, need to be involved not only in proclaiming the human right to food, but also in empowering people to cultivate and access adequate nutrients. In this task, particularly in the sub-Saharan African situation where food security is particularly threatened due to the HIV epidemic, it is important that countries, companies and non-governmental organizations internationally cooperate to manage the knowledge transfer of raising livestock and cultivating food in order to provide primary healthcare, enable the eventual education and employment of affected individuals, to sustain economic markets and productivity, and to maintain social and fiscal stability. The cycle in turn reinforces potential and productivity locally and globally, leading to economic profitability and social stability. As complicated as it is, not to mention the implied logistics of it, it is the only really logical argument and action, and it is vital for broader security and for the sanctity that breeds sustainable success.
7.1 Micro-economy of HIV/AIDS, agriculture and food security

At the micro-level, HIV/AIDS results most often in the untimely death of a prime-age, working adult. This is compounded by additional complicating factors of stigma and even anti-retroviral treatment. The consequences of the loss of income, the time taken to care for the ill individual, the diversion of monies from schooling and food expenditure, and the cost of the funeral and burial all have detrimental affects on household agriculture and food security. Due to HIV/AIDS, productivity in often the already strained and strapped smallholder sector is low and declining.

Loss of cultivation knowledge and capacity in agriculture caused by HIV/AIDS perpetuates subsistence farming. Land, usually below two hectares per household, remains a limiting factor in agricultural production. It is estimated that there are over 13 million people crowded in the former homeland areas, many of whom are poverty stricken (Lahif, 2001). The added burden imposed by HIV/AIDS debilitation and death may result in greater income and asset inequality. Those who suffer most under that burden are women and children, particularly girls. Women tend to bear the brunt of caring for ill individuals, as well as for household tasks, and in not inheriting agricultural knowledge, are less equipped to generate or renew income or even agricultural subsistence upon the death of a male household head especially. It is imperative to attend to gender roles, and an appropriate balance between investments in long-term rural economic productivity growth and targeted assistance to AIDS affected households and communities. Fundamentally a holistic approach of a life beyond living is vital to controlling and channeling the disease, with both political will, economic power, and personal practice.

7.2 Macro-economy of HIV/AIDS, agriculture and food security

The ability to affect the causes and consequences of HIV/AIDS on agriculture belongs in large-part to the macro-level arena. Key to food security is sustainability of survival, and enabling economic access to that enduring security lies in the macro-economic sphere,
nationally and internationally. Although variables such as the exchange rate, import/export policies, inflation and budget deficits, can have significant implications for prices, incomes, and employment, especially for the poor, cannot be controlled, contributions can be made to conditioning sustainable food security. South Africa is a player in the international economy particularly on a policy level, as it has most of the 'right' World Bank approved macro-economic policies to attract investment, however, it does not qualify for much of the poorest countries grants and loans, despite being still in particular in many agricultural areas a predominantly developing country. Particular protection must be given to food production in danger from natural disasters, as well as from the potential disincentive and dependency-generating effects of food aid, while stratifying supports in the form of subsiding subsidies, technological skills training, and knowledge management. Most importantly, food security, like any other security, requires strategic political-economic commitment.

7.3 Policy Recommendations on Agriculture, Food Security and HIV/AIDS

Food security policies and programmes need to harness the powers of interrelated national, community, and household food security problems and potentials to deliver the commitment and the capacity to confront and challenge the impact of HIV/AIDS on agricultural food insecurity. In a world increasingly integrated through trade and political-economic ties among nations, sufficient global availability of food is of increasing importance for household food security. In order to address the causes and consequences of the challenges posted by HIV to agriculture and food security in rural areas the following policy prescriptions are presented.

- Harnessing the political will to secure land ownership, and to provide security from internal/external threats; from market forces;
- Enable women who are left behind in rural areas by migrating husbands and family members to access the deeds to lands in order to cultivate subsistence and cash crops, to bring them to market, and to sustainably support their dependents;
• Promoting awareness and understanding about the importance of nutrition in treatment of HIV-infected individuals and other household members;

• Advocacy nationally and internationally for more equitable access to agricultural economics markets in order to secure the sustenance of sustainability for survival but also for insurance against market fluxes and the crippling consequences on life beyond living; for instance at the WTO Doha Round talks being resumed;

• Stratified subsidies: support, efficiency, and more equitable access to markets is required for sustainable solutions to combating and to moving beyond the challenge of AIDS in agriculture;

• Differentiated policy responses that cater for households of different vulnerability levels. The study has shown that HIV/AIDS affects households to different extents, and the degree of household’s vulnerability to food insecurity depends on a range of factors which are peculiar to the household. Involving community based organizations in the design of programmes to alleviate food insecurity and HIV/AIDS will enable the responses to be more localized resulting in improved effectiveness.

• Knowledge management and transference between family members, particularly women and children often currently excluded from that process; to wealthier landholders who can protect productivity and provide food security while ensuring sustainability in the longer-term; input and practice of less labour-intensive cultivation, cash-crop, livestock and domestic work to ensure maximum output for less input; also diversification of skills, crops, labour, knowledge;

• Cooperative intervention between agriculturalists, livestock farmers, extension officers, NGOs and other to enable maximal protection of productive cultivation and food security;

• Changing the strategic aim of agricultural and rural support services in the nodal areas to include achieving food security and poverty alleviation. Focusing on Land allocation/reclamation; stratified support: initial subsidies, then reducing; enabling agriculture and also alternatives - Local cooperatives (especially to reduce migration and detrimental effects thereof); Public works – employment schemes;
• Recognizing and utilizing indigenous ability and availability of agricultural knowledge; top-down commitment is vital, but bottom-up contribution is veritably the only way that HIV/AIDS can be contested in agriculture; particularly emphasizing the particular needs of HIV/AIDS positive persons, but also those affected in nutrition, but in other needs, notably enabling education;

• Capacity investment: micro-finance; investment; infrastructure – physical, and knowledge (technical and indigenous).

7.4 Areas for further studies

The potential of the HIV/AIDS pandemic to destroy smallholder agriculture, particularly the current efforts of the department of agriculture to commercialize agriculture, makes it necessary for urgent action to be taken to assist communities in mitigating the effects of the pandemic. Whilst this study has provided an insight into the quantitative impacts of HIV/AIDS on agriculture and food security in Limpopo Province based on this case study, there is a need for government and other stakeholders to commission further studies in this area, as well as in other provinces. More importantly the impacts can better be assessed by tracking households that have been affected by the pandemic over a longer period of time. The study has established baseline data that can be used to compare with more data to enable time series analysis. The FANRPAN should seek funding to enable follow up of these households in a longitudinal study, for a better assessment of the impacts of the pandemic. A longitudinal study will also enable the evaluation of various mitigation strategies, and programmes that are currently in place.
8.0 REFERENCES

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### ANNEX 1- LIST OF VARIABLES USED IN HVI CALCULATION

<table>
<thead>
<tr>
<th>Variable tracked in study</th>
<th>Variable Name</th>
<th>Weight given to variable in the study</th>
<th>Transformation used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependency ratio</td>
<td>dependency</td>
<td>3</td>
<td>A value of 1 was set for all households with dependency ratio greater than 1, and zero otherwise.</td>
</tr>
<tr>
<td>Number of dependants</td>
<td>Dependents</td>
<td>3</td>
<td>For this variable, 1 was set for households with 3 or more dependents, and 0 for those with less.</td>
</tr>
<tr>
<td>Age of head of household</td>
<td>AgeOfHeadofHH</td>
<td>2</td>
<td>The following transformation was used: 0 for households headed by people aged between 20-60, 1 otherwise.</td>
</tr>
<tr>
<td>Have Household members suffered from any AIDS related illnesses?</td>
<td>AidsRelatedIllness</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>Total Household size</td>
<td>TotalHouseholdSize</td>
<td>1</td>
<td>Set 1 for those above 10 and 0 otherwise</td>
</tr>
<tr>
<td>Percentage of field cultivated</td>
<td>PercentageFieldCultivated</td>
<td>2</td>
<td>Set 0 if Percentage of Field Cultivated between 90-100, 1 otherwise set 1 for &quot;no formal education&quot; and &quot;primary education&quot;, 0 otherwise</td>
</tr>
<tr>
<td>Highest Education level for Head of Household</td>
<td>EducationLevelHHH</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Who is the head of the household?</td>
<td>FamilyHead</td>
<td>4</td>
<td>Set Widowed or Orphans = 1, 0 elsewhere</td>
</tr>
<tr>
<td>AIDS TAKES CHILDREN'S TIME TO BE AT SCHOOL LOOKING AFTER THE SICK</td>
<td>SchoolTimeLost</td>
<td>2</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>AIDS TAKES FARMING TIME AS PEOPLE WILL BE LOOKING AFTER SICK PEOPLE</td>
<td>FarmingTimeLost</td>
<td>2</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>LIVESTOCK IS SOLD TO FINANCE MEDICATION OF THE SICK</td>
<td>LivestockIs</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>Variable Description</td>
<td>Variable Name</td>
<td>Variable Type</td>
<td>Definition</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>AIDS TAKES TIME FOR HOUSEHOLD CHORES AS PEOPLE WILL BE LOOKING AFTER SICK PEOPLE</td>
<td>ChoresTimeLost</td>
<td>2</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>AIDS TAKES TIME FOR PARENTING AS PEOPLE WILL BE LOOKING AFTER SICK PEOPLE</td>
<td>ParentingTimeLost</td>
<td>2</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>WAS LIVESTOCK SLAUGHTERED AT FUNERAL OR NOT</td>
<td>LivestockSlaughter</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>AMOUNT OF MONEY SPENT ON MEDICAL EXPENSES IN R</td>
<td>MedicalExpenses</td>
<td>5</td>
<td>For this variable, 1=if expenses&gt;=-0.5*SD, 0=Otherwise</td>
</tr>
<tr>
<td>FINANCIAL RESOURCES FOR OTHER HOUSEHOLD NEEDS ARE DIVERTED TO LOOK AFTER THE SICK</td>
<td>FinancialResourcesDiverted</td>
<td>4</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>TOTAL HOUSEHOLD INCOME</td>
<td>TotalIncome</td>
<td>5</td>
<td>Set 1 if the income less than the mean income and 0 otherwise</td>
</tr>
<tr>
<td>HOUSEHOLD MEMBERSHIP TO SOCIAL CLUBS</td>
<td>SocialClub</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>WHETHER ASSISTANCE IS RECEIVED FROM NGOS OR NOT</td>
<td>NGO</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
<tr>
<td>WHETHER ASSISTANCE IS RECEIVED FROM EXTENSION WORKERS AND DEPARTMENT OF AGRICULTURE OR NOT</td>
<td>AgricExten</td>
<td>3</td>
<td>For this variable, 1=yes, and 0=no</td>
</tr>
</tbody>
</table>