IMPACT OF HIV & AIDS ON AGRICULTURE AND FOOD SECURITY FROM ZIMBABWE

Empirical Analysis of Two Districts in Zimbabwe

2006

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List of Abbreviations

AIDS - Acquired Immuno Deficiency Syndrome
ANC - Antenatal Clinic
ARV - Anti Retro Viral
CBC - Community Based Care givers
CHBC - Community home based care
CSO - Central Statistical Office
DFID - Department for International Development
FAO - Food and Health Organisation
GDP - Gross Domestic Product
HBC - Home Based Care
HIV - Human Immunodeficiency Virus
HSRC - Health Systems Resource Centre
IFAD - International Fund for Agricultural Development
MOHCW - Ministry of Health and Child Welfare
NAC - National AIDS Council
NAFT - National Aids Trust Fund
NANGO - National Association of Non Governmental Organisations
NGO - Non-Governmental Organization
PLWHA - People Living With HIV/AIDS
PMTCT - Prevention of Mother to Child Transmission
SaAIDS - Southern Africa AIDS Dissemination Center
SANASO - Southern African Network of AIDS Service Organizations
VCT - Voluntary Counselling and Testing
ZAN - Zimbabwe AIDS Network
ZRCS - Zimbabwe Red Cross Society
PROGRESSA
NACP
TB - Tuberculosis
Executive Summary

1. Background

Smallholder agriculture, once a strong and resilient backbone of Zimbabwe's national food security strategy, is under serious threat from the devastation of HIV and AIDS pandemic. Understanding the complex dimension and dynamics of HIV and AIDS threat to smallholder agriculture and food security is important especially for deriving policy insights on how to cushion the sector from HIV and AIDS damages. The Zimbabwe team of specialists joined forces with peers from other SADC countries to undertake a regionally coordinated country studies to assess impact of HIV and AIDS on Smallholder Agriculture and Food Security. The manuscript presents the report on the Zimbabwe study.

2. The Objectives

The fundamental objective of the study was to generate insights for policy planners and development practitioners on how to mitigate impact of HIV and AIDS on agriculture. To achieve this objective the study sought the following specific objectives:

(a) To develop a comprehensive framework for assessing impact of HIV and AIDS on agriculture and food security performance of smallholder farmers

(b) To explore the macroeconomic issues driving HIV and AIDS pandemic and assess the efficacy of responses from state and non-state actors in modulating impact of HIV and AIDS on Smallholder Sector

(c) To explore the extent and processes by which HIV and AIDS is affecting agriculture and food security performance of smallholder sector in the presence of other stress factors

(d) To identify aspects of smallholder farming system most vulnerable to HIV and AIDS damages

(e) To verify gender dimensions of vulnerability of smallholder farmers to the impacts of HIV and AIDS?

3. Research Approach:
Informed by the current thinking in the literature, the study develops and applies a comprehensive impact assessment framework, which combines macroeconomic dimensions with household level socioeconomic impacts and adaptive responses.

The study uses primary data obtained through a cross sectional single period survey of 350 agricultural households in the Goromonzi District of Mashonaland East and Makoni District of Manicaland. Working in collaboration with local agencies, the team was able to apply a stratified sampling and separately targeting HIV and AIDS affected population to constitute 50% of the sample while less affected families constituted the remainder.

To measure impact of HIV and AIDS on families, comparison of performance of ‘affected with versus not (i.e. less) affected households is made. Given that almost all families are affected, the study computed measures of severity and econometric techniques to ascertain significance of HIV and AIDS in explaining differences in agricultural choices and performances between affected and less affected households

4. The Findings
The study confirms that HIV and AIDS pandemic is generally negatively affecting the performance of smallholder agriculture and in particular their food security prospects. However smallholder agricultural populations have once again proved very resilient and innovative in minimizing impact of HIV and AIDS losses on their agricultural livelihoods. But the macro environment and agricultural policy failures have tended to erode rather than reinforce capacity of smallholder farmers adapt to their changing agricultural circumstances in the face of HIV and AIDS - induced loss of family labor, incomes and assets. Some of the main specific findings are that
(a) State and non state actors have responded to the HIV and AIDS pandemic but coordination failures and capacity challenges have limited the geographic reach and the efficacy of programming HIV & AIDS interventions in terms of coverage of mitigation issues of interest to smallholder farmers
(b) HIV and AIDS is significantly adversely affected food security of rural households primarily through negative impact on remittance income
(c) HIV and AIDS is negatively affecting agricultural productivity but the damage is not as significant because of the presence of other agricultural policy related stress factors that are persistently driving farm productivity down
(d) HIV and AIDS is transforming farming system towards crops that save on resources - labor, cash, assets- most adversely affected by HIV and AIDS
(e) HIV and AIDS is significantly eroding the productive asset base of farmers below critical levels sending agricultural populations into income poverty as well as asset poverty which guarantees chronic poverty and livelihood insecurity by reducing capacity to grow a crop and capacity to cope

(f) HIV and AIDS is disproportionately burdening the vulnerable women headed households who are suffering more from HIV and AIDS induced poverty and yet offering more to society in care giving

5. The Recommendations

The recommends the following policy actions for government and development practitioners

(a) Ministry of Agriculture assumes leadership in articulating policy issues and designing programs for mitigating impact of HIV and AIDS in collaboration and under the auspices of National Aids Council.

(b) NAC Monitoring and Evaluation Unit spearheads the creation of national data bank for effective monitoring and evaluation of impacts of HIV and AIDS impacts on agriculture among other sectors and for informing mitigation strategies

(c) That Government recognizes the importance of sustaining a conducive agricultural policy environment free of price distortions as the best arsenal for farmers to combat impact of HIV and AIDS

(d) Initiate support programs for facilitating and safeguarding acquisition and growth of productive livestock assets by rural farmers living with aids.

(e) Given the social benefits of effectively addressing the cattle crisis in rural areas are therefore immense in the face of HIV and AIDS. The solution to the challenge is multi-pronged.

- **Political pressure on traditional leadership to discourage the customary practice of disposing the widow(er) of remaining cattle holdings upon death of her(his) spouse.** So far the practice has noticeably slowed down due to soft non-coercive strategy of moral suasion. Coercive legislation may be necessary to protect the remainder from the 20% of families still bent on the practice.

- **Targeted roll out of a comprehensive HIV/AIDS support programs for rural families living with AIDS aimed at providing sufficient resources for care to the rural families so that they do not resort to poverty-worsening measures of consumption much needed livestock capital base essential for sustaining agricultural production and resilience of rural farmers living with aids.**

- **Expansion of livestock investment support program into rural areas to encourage restocking and commercialization of rural herd.** However special program to give a herd -start to young rural families diagnosed to have HIV and AIDS may also be necessary to encourage young families to detect illness early and start early on psycho-socio and economic counseling (and treatment when available) and on their sustainable livelihood strategy.
1. Introduction

1.1 Background

Southern Africa is the epicenter of HIV & AIDS pandemic in Africa and Zimbabwe is one of the countries hardest hit with infection rates of 26% and life expectancy down to 38 years. The implications of these high rates of HIV and AIDS infections, illness and deaths on sustainable agriculture and food security must be a fundamental concern of government and its development partners, Yet national governments continue with business as usual agricultural policies and programs which tax rather support rural agricultural populations. There are two apparent schools of though on HIV and AIDS one of which believes that adequate programming to nullify the cause or source is the most effective way of dealing with the pandemic. Another school of thought contend that we may lose the fight of containing the HIV and AIDS crisis but win the war of reducing to a minimum its socioeconomic damages. From these two views comes the third way combining the two contesting strategies. The absence of innovative policies and public programs to mitigate the impact of HIV and AIDS on agriculture and food security does not necessarily imply an absence of political will. But sometimes reflect failings of policy research institutions and stakeholders bearing the brunt of policy failure to timely communicate and engage and sensitize policy makers on emerging strategic issues of national interests.

This monogram presents the full report of a study, initiated and undertaken by local Africans, on the Impact of HIV and AIDS on Agriculture and Food Security Performance of Smallholder Sector in Zimbabwe paper. The study follows on the back heel of a number of studies on HIV and AIDS. A lot of the earlier studies were designed to serve their purposes very well by bringing high profile attention to the issue of HIV and AIDS and about the plight of the patient, This study seeks to put the focus of national government on the issue of how HIV and AIDS pandemic is affecting performance of the smallholder agricultural sector and role of impact mitigation policy. The motivation for undertaking the study was to explore comprehensively the issue of how HIV and AIDS affect smallholder agriculture in order to inform policy options. And then engage with policy planners and development practitioners on how to protect domestic agricultural sector performance from HIV & AIDS. Zimbabwean agricultural sector has demonstrated resilience in the past but it has not been presented with such a multi-faceted dynamic and cumulative shock as HIV and AIDS.
1.2 Nature HIV&AIDS Challenge and its Dynamic Impacts on Smallholder Agriculture

HIV and AIDS is a unique shock against which the smallholder agricultural sector is particularly vulnerable. The basic strategy for dealing with shocks is to understand their dynamic and then use that knowledge to design a strategy that effectively counteracts impact of the shock. The first challenge posed by HIV and AIDS is whether Zimbabwe and Southern Africa will ever be able to contain epidemic given that HIV infections rates rose unabatedly over the past 5 years of intensive education campaigns of NAC. HIV and AIDS cause immense devastation to smallholder agriculture because it is depriving rural families and the village communities of the young productive generation which is send to work for wages income in urban industries. Once the young men would remit income to help develop smallholder agriculture into a resilient strategic sector. But now they remit HIV and AIDS as they return to their rural home for family care. Because rural families dutifully finance health and nutritional care for all its sick albeit through sale the remaining productive farm assets without which the surviving family, rural community and perhaps the whole nation may never be able again to restore productivity and food security

Thus the HIV and AIDS pandemic leaves the rural agricultural communities progressively entrapped deeper and deeper in both income poverty and asset poverty amidst rising livelihood insecurity. The dynamics of how rural farmers get so entrapped would show that the HIV and AIDS impacts are channeled through variety of sources. HIV and AIDS affect family members in town as well as in the village. In addition to the remittance income effect and the asset removal effects of HIV and AIDS, government policy failures - poor producer pricing policy and poor financing of an otherwise excellent and beneficial source of new technologies for farmer - enhance vulnerability of the farmer. Agricultural policy environment which persistently provides incentive prices provide a cushion to help farmers invest in mitigation strategies against impacts of HIV and AIDS

Prospects for effective adaptation to offset HIV and AIDS impacts on households that are left with less labor and less cattle is depends on availability of newly adapted labor-saving and capital-saving farm technology options suitable for the new resource poor circumstances. Only a well funded and operationally efficient public institutions of agricultural technology research and extension for rural development will be able to remain relevant to HIV&AIDS-driven dynamic changes in farmer circumstances. Chronically under funded public research and extension will fail to provide strategic new technologies (that save the scarce resource) offering farmers with best production possibilities for the changed environment - ravaged by HIV and AIDS.
1.3 Key Questions Explored in the Study

In light of the multiple stress factors - macro factors, micro factors, social factors, agricultural policy factors, public health care and aids treatment policy factors etc-- that moderates HIV and AIDS effects on Agriculture and Food security performance of smallholder farmers, a number of issues arise:

(a) What is Macroeconomic State and Response of state and non-state actors to HIV and AIDS pandemic?
(b) What is the impact of HIV and AIDS on agriculture and food security performance of smallholder farmers - in the presence of other stress factors and modulating factors?
(c) Which aspects of smallholder agriculture and food security drivers are more vulnerable to the impact of HIV and AIDS - in the presence of other stress factors and
(d) Does HIV and AIDS affect smallholder farming by women differently
(e) How important is HIV and AIDS driving observed asset dynamics?

To explore these key questions, used some secondary data mainly to explore macroeconomic issues secondary data on macroeconomic state and Responses of government and NGOs to AIDS pandemic. The rest of the questions were answered from primary data collected from two provinces of Zimbabwe

1.4 Organization of the Report

The report is organized into seven eight chapters, beginning with this introduction chapter. Chapter 2 and 3 are the literature review and methodology chapters. The literature review chapter is abridged and concise version of the annotated bibliography of the literature on the subject that the authors found useful. It can be made available upon request. Chapter 3 presence a detailed description of the conceptual framework and research methodology complete with challenges faced. Chapter 4 through 7 represents the four core analyses undertaken in preparation of this report.

Chapter 4 presents results from a qualitative analysis of the macro issue and important sections on how state and non-state actors are responding the HV and AIDS Crises. Chapter 5 presents the bulk of results from the microeconomic analysis of survey data. It combines a discussion of descriptive statistics and econometric results exploring the second and third questions of the preceding section. Results of from integrated comparative analysis of impacts of HIV & AIDS on Women in Smallholder farming sector. The analysis includes valuation of care-giving services of women. Chapter 7 present results from an exploration of impact of HIV and AIDS on asset dynamics last chapter pulls together the main insights from the study.
2. Literature Review

2.1 Introduction

There is a growing literature on the impact of HIV & AIDS on African agriculture. The literature can be grouped into three key categories as follows:

a) Labor Effects of HIV and AIDS
b) Documentary case studies on impact HIV & AIDS on African families and communities
c) Analytical studies using empirical studies to test theoretical paradigms on how HIV & AIDS affects national economic development prospects or affects performance of specific sub-sector

These three strands of literature play different but complementary roles in drawing policy attention to the HIV & AIDS crisis. A critical review of these literatures is conducted here with two aims in mind. First there is need to explore some of the hypotheses that are implicit and sometimes explicit in HIV & AIDS impact mitigation programs of various international and local NGOs on the frontlines combating HIV & AIDS in various African communities.

Secondly, the hypotheses implicit from stories that are told by field operatives need integration, collaborated and validated so as to start the process of building a body of scientific knowledge or theory on how HIV & AIDS affect agricultural and economic conduct and performance of families and firms.

Thirdly critical review of the current literature helps in taking stock of current knowledge of how HIV & AIDS affect economic outcomes especially in view of existing economic theories of microeconomic behavior of individual economic agents and macro-economic behavior of national and sub-sector economic systems. This integrative analysis helped in identifying consistencies and inconsistencies between emerging knowledge from HIV & AIDS crises and existing body of microeconomic and macroeconomic theory calling for possible extensions and adaptations of that body. Agricultural and economic development programs and mitigation strategies for reducing food security vulnerability are informed mostly by commonly accepted economic paradigms.
2.1 Labor Implications of HIV and AIDS

a) Labor Productivity and Income Performance

The impact of HIV on economic outcomes begins with its debilitating impacts on the health status of the sufferers, which in turn produces direct and indirect impacts on economic performance, and income of the sufferer’s household. These two effects do not necessarily pull the household in the same direction as they produce a mixture of negative and offspring positive effects, which render the final impact or outcome ambiguous.

HIV & AIDS directly affects household livelihood through its negative effect on labor productivity and on the number of effective workdays of family members. Family members spend time attending to the sick and conceivable this implies reduction in family time for leisure and sometimes for productive activities. When ailing family member is engaged in casual wage employment a reduction in productivity and increased absentism from work translates into income loss. The impact of declining productivity of family members in the civil service and middle level management position may not necessarily result in less earning, as their employment contracts are not based on output. Agricultural households, which typically combine off-farm wage employment of some family members with on-farm engagement of the rest of the family member in agriculture suffer doubly from the impacts of HIV and AIDS on family labor. Family members in urban full-time wage employment stay away from home and are at risk of contracting HIV & AIDS as migrant workers in distant urban areas. Through their occasional visits to their rural homes, these urban employed family members often end up remitting both HIV and AIDS disease and income to their rural based spouses.

Family Labor in Wage Employment: From neoclassical economic theory of labor, labor earnings from formal wage employment would depend on average productivity of the workers at firm and industry level. In reality institutional rigidities render industrial wages fixed and unionized. Only casual hire of unskilled and non-unionized labor is employed on piecemeal contract and paid wages that reflect actual individual productivity and number of days of work. Thus the firm with permanent workforce might suffer output loss from reduced average labor productivity due to HIV & AIDS infection of its workforce and increased absentism. But this productivity loss seldom translates to reduced income earnings for the individual worker and his agricultural household, thanks to union imposed wage regulations. Thus the industrial firms might suffer from reduced profit and lack of growth due to increased explicit and implicit costs of HIV & AIDS among the workforce while workers are protected by their union from suffering direct loss of income during the early stages of the disease. Thus a preoccupation with microeconomic impact might underestimate the income loss suffered by industry and hence by the nation. This is
particularly possible whenever there are strong labor unions and pro-labor governments protecting workers erects regulations to protect HIV & AIDS afflicted workers from absorbing expected adverse effects of the disease on labor productivity and wage income.

**Family Labor Employed on the Family Farm and Non-Farm Enterprises:** For purely subsistence peasant households, HIV & AIDS infection is felt much more directly. Productivity of a family member and her absentism from on-farm and off-farm income earning activities is felt especially when the household has a pressing labor bottleneck. Do peasant households in Southern Africa possess surplus labor or are they suffering from economically binding labor constraints? The literature is divided on the subject. The modern theory of the household, which has its roots in, the pioneering works of Russian economist, Chayanov (1931) and formalized by Singh, Squire and others including Becker’s Family Economics suggest dynamically changing labor status of peasant households. Typically peasant households go through a demographic transition, which changes their labor status changes dynamically from a deficit to surplus and later might revert back to a deficit situation. There is however contesting schools of thought, which suggest that peasant agriculture is a source of surplus labor for industrial growth. Models of industrial growth put forward by Rostow and Lewis (1978) make this presumption. Peasant agricultural specialists and development practitioners provide compelling evidence to dispute this hypothesis and point to perennial problems of seasonal labor shortages adversely affecting peasant food production system.

Implications of the surplus labor hypothesis are that the peasant sector may not be as sensitive to HIV & AIDS induced decline in supply and productivity of family labor as is often assumed. Labor effects of HIV/AIDS on production performance of peasant agriculture would not be significant when households are endowed with surplus family labor compared to situations in which the farm-families were already enduring seasonal labor bottlenecks before being affected by AIDS.

Even in the cases in which household enterprises are sensitive to labor supply and productivity impacts of HIV & AIDS, the overall income effects depend on the extent to which the household is able to adapt its farming system. For example substitution of capital or land for labor can occur in resulting in a dramatic changes to the farming system to minimize (but not entirely eliminate) impact of the initial shock on the objective. Thus the extent to which households are able to undertake economic adjustment of technology and enterprise mix is a key determinant of overall impact of HIV & AIDS on household income performance.
(b) Indirect Effects of HIV & AIDS on Family Labor and Labor Productivity:

The indirect effects of labor include the increased home care demand for family members time and reduced productivity possibilities when family member is ultimately retrenched from wage employment due to ill health. The first indirect effect demonstrates the geometric rather than linear effect of the disease on family labor supply. Caring for the ailing further reduces effective family labor available for productive occupation as the most productive among the healthy family members is often assigned as care giver to the ailing member leaving younger children to undertake productive activities with little adult supervision culminating in productivity decline.

HIV & AIDS disease affects labor productivity indirectly through its impact on budget constraint. Like any other ailment, HIV & AIDS takes a financial toll on the family budgetary constraints limiting ability of the household to acquire such agricultural technologies as hybrid seed and fertilizer, which enhance labor productivity on the family farm. The financial cost of the disease sometimes forces families to de-accumulate capital stocks (bicycle, plows, oxen, cows) without which the household is left operating at a much lower productivity frontier. Evidence from empirical surveys by Mutangadura et al (1999); and NGOs such as World Vision (2003), CRS (2003) and FEWSNET (2002) indicate increased incidence of sales of productive agricultural assets among families caring for HIV & AIDS afflicted male heads of households. This would imply that widowed peasant farm-households often suffer deepened productivity losses and chronic poverty following the first round of deaths of the male heads of households due to the over expenditure and de-stocking of family wealth. Further loss of assets associated with customary inheritance practices further leaves the surviving family household poor and unable to sustain its pre-death yields and food security status.

2.2 Impact of HIV & AIDS on African Families and Communities.

a) Case Histories from Zimbabwe

Zimbabwe’s development community is awash with documented case studies illustrating the socioeconomic consequences of HIV & AIDS in Zimbabwe. Majority of these case studies confirm the gravity of HIV and AIDS in both urban and rural communities in terms of HIV infection rates, related mortality rates, the number and misery of orphaned children (as in 2002/3 Reports of the Catholic Relief Services; AfriCare, Care, World Vision. These studies continue to highlight the plight of HIV & AIDS affected families. Other independent studies have also noted the failure of African traditional mechanisms
such as the extended family and communal village institutional systems for coping with disasters because of the shear magnitude of the HIV & AIDS burden on the impoverished community.

As with most documented case histories and case studies, these reports often suffer from their lack of scientific representational problems, which often result in biased representation of the population by dramatizing what may be special cases rather than the present norm. Nevertheless, these studies continue to play a role in publicizing the plight of HIV & AIDS victims and in drawing much needed policy attention of national governments and donor community to allocate more resources towards HIV & AIDS prevention, mitigation and support programs in Zimbabwe. For Zimbabwe, this task continues to be a daunting one especially under the current prevailing negative global perceptions about domestic political and economic governance (Amnesty International Report 2001-3, US State Department Country Profile 2002-4). However, more scientific studies are a prerequisite complement for the development of a long range policy strategy taking the debate beyond the current preoccupation with educational campaigns and coping with the disease towards long range issues of mitigation and recovery of HIV & AIDS affected families. The HIV & AIDS there is need for more objective scientific back-up studies to validate the case study observations of individual programs

b) Dimensions of HIV & AIDS in Africa

UNAIDS reports that about 25.3 million infected people – 70% of the total are in sub Saharan Africa and that about 22 million people have already died since the beginning of the epidemic. In 2000 alone, nearly 600 000 children most of whom were born to HIV-infected mothers became newly infected with HIV & AIDS. Nine out of the 10 of the newly infected infants were in sub Saharan Africa (USAID 2001). Of the entire infected population of adults in Africa, 20% come from only nine southern African countries – Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. This is alarming especially given that most of the infected do not even know they are infected. This alone gives some basis to explore some literature on the kind of responses that have been taken by both from public and private stakeholders especially in southern Africa to help curb the continual spread of this epidemic and its adverse effects on the livelihoods of mostly African rural societies.
### Table 2.1 Adult HIV Infection Rates (%), end of 2003

<table>
<thead>
<tr>
<th>Country</th>
<th>Infection Rate</th>
<th>Country</th>
<th>Infection Rate</th>
<th>Country</th>
<th>Adult Infection Rate</th>
</tr>
</thead>
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<tr>
<td>Swaziland</td>
<td>38.8</td>
<td>Chad</td>
<td>4.8</td>
<td>Eritrea</td>
<td>2.7</td>
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<td>Gabon</td>
<td>8.1</td>
<td>Ethiopia</td>
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<td>Lesotho</td>
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<td>Burkina Faso</td>
<td>4.2</td>
<td>Sudan</td>
<td>2.3</td>
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<tr>
<td>Botswana</td>
<td>37.3</td>
<td>Mali</td>
<td>1.9</td>
<td>DRC</td>
<td>4.2</td>
</tr>
<tr>
<td>Cote d’Ivoire</td>
<td>7.0</td>
<td>Cameroon</td>
<td>6.9</td>
<td>Benin</td>
<td>1.9</td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>24.6</td>
<td>Kenya</td>
<td>6.7</td>
<td>Uganda</td>
<td>4.1</td>
</tr>
<tr>
<td>South Africa</td>
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<td>Burundi</td>
<td>6.0</td>
<td>Madagascar</td>
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</tr>
<tr>
<td>Namibia</td>
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<td>Angola</td>
<td>3.9</td>
<td>Togo</td>
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</tr>
<tr>
<td>Zambia</td>
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<td>Gambia</td>
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<tr>
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<td>5.1</td>
<td>Niger</td>
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<tr>
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<td>Guinea</td>
<td>3.2</td>
<td>Senegal</td>
<td>0.8</td>
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<tr>
<td>Central Af. Rep.</td>
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<td>Congo Brazzaville</td>
<td>4.9</td>
<td>Ghana</td>
<td>3.1</td>
</tr>
<tr>
<td>Mozambique</td>
<td>12.2</td>
<td>Djibouti</td>
<td>2.9</td>
<td></td>
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</tr>
</tbody>
</table>


c) Africa’s Response to HIV & AIDS Epidemic

Africa has taken a long time to get started with policy response to HIV & AIDS. Social norms and taboos, or lack of decisive or effective institutions have all contributed to the slow response getting worse (Washington post, 1999). At the same time, reduced health and emergency budgets in all African nations further constraints the capacity of African governments to respond adequately to HIV & AIDS. This situation is mainly due to a combination of poverty and debt, where some African nations are paying more in debt reserving to western institutions, than on health, education and other services (http://www.globalissues.org/Geopolitics/Africa.asp, 29/9/05). Generally despite these drawbacks African governments especially some in eastern and southern Africa have constitutionalised HIV & AIDS and this has enabled them to put in place national policies that enhance national responses to the problem of HIV & AIDS.

Many observers believe that the spread of AIDS in Africa could have been slowed if African leaders had been more engaged and outspoken in earlier stages of the epidemic e.g. the South African leader Thabo
Mbeki. From the year 2000 the South African president refused to recognize and declare AIDS a national emergency until April 2002 when he finally succumbed to domestic and international pressure and increased the budget allocated to HIV & AIDS (Copson, 2005). On the other hand, some African governments which responded quickly to the problem of HIV & AIDS, managed to record some significant noticeable successes. President Yoweri Museveni of Uganda has long been recognized for leading a successful prevention campaign against AIDS in his country, and Uganda’s ABC (Abstinence, Be Faithful, or Use Condoms) transmission prevention program has won wide praise (“Uganda Leads by Example on AIDS,” Washington Times, March 13, 2003.) The presidents of Botswana and several other countries are widely seen today as in the forefront of the AIDS struggle as well (Copson, 2005).

Africa’s response to HIV & AIDS has recorded a fair part of its success stories. Uganda managed to markedly reduce its rate of infection among pregnant women in urban areas from 29.5% in 1992 to 5% in 2001 (UNAIDS, 2002). The infection rate has continued to drop. In 2003, adult prevalence nationwide was 4.1%, compared with 5.1% in 2001 HIV prevalence among young urban women in Zambia has also reportedly fallen, and UNAIDS indicates that urban sexual behavior patterns among young people in cities in other countries maybe changing in ways that combat the spread of HIV. However, increases in infection rates continue in cities in several other countries. South Africa has recorded a drop in infections among pregnant women under 20. Senegal is credited with preventing an AIDS epidemic through an active, government-sponsored prevention program (Copson, 2005). Despite some success stories, however, the number of infected people in Africa continues to grow. A major barrier are the cultural norms that make it difficult for many government, religious, and community leaders to acknowledge or discuss sexual matters, including sex practices, prostitution, and the use of condoms. But through programs such as PROGRESA, a program that aimed at improving the educational, health and nutritional status of poor children in Mexico, it is possible raise enough people’s awareness and increases their willingness to access public and private health (Gertler, 2000). Through carefully selected incentives for preventive care and nutrition-improved health, there is an opportunity to lower the incidence of severe illness in most African societies thereby reducing the impact of AIDS.
2.3 HIV & AIDS Impact Areas on Agriculture

The global HIV/AIDS epidemic has widespread adverse effects on social and economic development and can no longer be considered solely as a health problem. Sufficient efforts are needed to address its social, economic and institutional consequences. Increasingly, the HIV/AIDS epidemic is having a major impact on nutrition, food security, agricultural production and rural societies in many countries. All dimensions of food security - availability, stability, accessibility and use of food - are affected where the prevalence of HIV/AIDS is high.

a) HIV & AIDS and Food security

Food security is the availability of food, access to food and the absence of risk either related to either availability or access. According to Barnett and Rugamela (2001), households are said to be food secure if four factors are in balance: Food availability, Equal access to food, Stability of food supplies and Quality of food. HIV/AIDS affects all these factors thus reducing food security. IFAD (1996), describes household food security as ‘the capacity of households to procure a sustainable and stable basket of adequate food’. Food security is related to a number of variables as shown below. These variables are heavily impacted by HIV/AIDS. The diagram below illustrates the relationship between food security and these variables.

i) Household level

At the micro level HIV/AIDS reduces the ability of the household to produce and buy food, depletes assets and reduces the household income and purchasing power thus reducing labour, management of farm resources and skills and reducing the productivity of current workers thus reducing food security. (Barnett and Rugalema, 2001) Mutangadura et al (1999) cites the major impacts of the disease on agriculture to include serious depletion of human resources, diversions of capital from agriculture, loss of farm and non-farm income and other psycho-social impacts that affect productivity. The loss of adult on- and off-farm labour is one of the most widely discussed effects of the HIV/AIDS epidemic (Topouzis and du Guerny, 1999). HIV/AIDS results in the loss of experienced agricultural workers, which affects both individual households and communities, resulting in labour shortages and declines in productivity both on and off the farm. A decline in productivity leads to declines in household income due to decline in both the household's own production and declines in off-farm income and remittances.
The loss of off-farm employment and the decline in on-farm labour is likely to reduce the area cultivated and shift cropping patterns to less labour-intensive practices. An increase in household expenditures on medical care results in a decline in savings and the loss of assets through the sale of both productive and non-productive assets. Thus, the loss of human capital leads directly to declines in the financial capital of the household (FAO). The household will thus be less food secure, due to less production.

ii) National level

Seven million agricultural workers are estimated to have died from AIDS since 1985. FAO (2002) estimates that another 16 million of the agricultural labour force in sub-Saharan Africa could die by 2020. This decrease in labour force due to death of agricultural workers disrupts organized activities due to frequent ill health and funerals of contract farmers and intended beneficiaries. A study in Uganda and Zambia (IFAD, 2001) discovered that increased funeral attendances led to the cancellation or postponement of expensive activities leading to untimely attainment of programme targets thus compromising the food security situation in the countries.

The reduction in labour force also as a result of the advent of the pandemic has seen more time being taken away from agriculture in order to take care of the HIV/AIDS sufferers. These macro-level impacts are paralleled by equally negative consequences for rural, agricultural households by increasing both livelihood insecurity poverty and hence food insecurity.

b) Impact of HIV & AIDS on Women in Agriculture

i) Women and HIV & AIDS

Women are highly vulnerable to the HIV & AIDS epidemic and the disease is affecting women and girls in increasing numbers. According to Marita Eibl and Valerie Foster (2002), women are fast becoming the predominant group that is infected and affected by HIV /AIDS and in Sub Saharan Africa. Women have a higher number of new HIV & AIDS cases than do men. In Zimbabwe 53% of all the people in the smallholder agricultural sector are women and children (Anon, 1994: Census, 1992 Zimbabwe National Report, CSO). Globally, just under half of all people living with HIV are female and in most regions, an
increasing proportion of people living with HIV are women and girls, and that proportion is continuing to grow, particularly in Eastern Europe, Asia and Latin America.

Obbo argues that men and women experience HIV & AIDS differently. He laments that this is not only medically but also socio-economically. The prescriptions that define the gender roles of women and men and govern the division of labour, distribution of the decision making power access to and control of resources and wealth among women and men determines the nature and extend of the epidemic borne by women. Obbo in his study thus pointed out that HIV & AIDS is definitely not an equal opportunity disease and thus affects women mainly. HIV & AIDS compounds the existing gender discrimination. NACP (2003) and De Bruyn (1992), concluded that women are especially vulnerable to HIV & AIDS because they have more vulnerable employment status dependent on labour intensive activities, lower incomes, least access to formal social security and least entitlements to or ownership of assets and savings.

ii) Women as Care Givers

Traditionally, rural women have always had a triple role to play in society. These roles are differentiated as reproductive, productive and community roles. (Sylwander and Simalenga (1997) and MOHCW, 2003)

Women usually take up care giving roles in their families and through community home based care. CHBC is generally holistic care that offers treatment and psychosocial support to patients, as well as support to caregivers and relatives, including orphaned children. A study done in Kagabiro village in Tanzania revealed that when a household included someone with HIV & AIDS 29% of the household labour was spent on AIDS related matters. In two thirds of the cases two women were devoted to nursing duties and in average the total labor that was lost to households was 43%. This affects yields that are produced since labour and time that would otherwise have been used productively in the fields or doing agricultural work is transferred to caring for the sick. The advent of HIV & AIDS has further expanded this role as women are required to or expected to take care of those who are sick with HIV & AIDS related illnesses. Women play this role both in the households/families and in the community. Usually women volunteer to do these roles which include basic nursing care, palliative care and also care for the orphans that are left as a result of HIV & AIDS related deaths. Women do these care giving roles as individuals or as groups, often working without pay. They work as volunteers through churches, local CBO's, NGO's as well as government initiatives (UNAIDS, 2003).
2.4 The Sustainable Livelihood Framework and HIV & AIDS

The sustainable livelihoods approach (Carney 1998, DFID/FAO 2000) perceives rural households to possess five livelihoods assets essential to their livelihood strategies: human capital, natural capital, financial capital, social capital and physical capital. Utilizing these assets, households adjust to their physical, social, economic and political environments through a set of livelihood strategies designed to strengthen their well-being (Stokes, 2003). Given the uncertain and risk environment that rural households already operates in, illness and death of household members due to HIV & AIDS further intensifies their problems. Stokes states that households are only viewed as being sustainable if they can adjust to threats without compromising their future ability to survive shocks to their livelihoods and HIV & AIDS is potentially one of those shocks.

Researchers have come up with a hypothesis that relates the impact of HIV & AIDS on asset accumulation and holding capacity of rural households. The most common hypothesis is that HIV & AIDS strips individuals, households, networks and communities of assets (Gillespie and Haddad, 2001). The pandemic

Source: DFID/FAO 2000
is alluded to represents a potentially devastating shock to farm household survival. The illness or death of one or more household members can affect each of the livelihood assets resulting in a reduction in the ability of the household to adjust to future shocks (Stocks, 2003). This research methodology for this study was informed by this approach.

2.5 Insights from the Literature

A lot of work has already been done on the impact of HIV and AIDS in Agriculture. Most studies have focused on the labor side of HIV and AIDS while others have focused on the cost of care. Many studies have noted with concern the disproportionate burden on women of HIV and AIDS pandemic. Most studies have focused on single issues. The issue of direction of impact of HIV and AIDS on agriculture has received sufficient verification and need not be articulated again. The challenge is in articulating magnitude of impact of HIV and AIDS on key impact areas and in identifying mitigation strategies most effective for different farmers and different circumstances. These insights and indeed the methodologies used therein inform the methodology and analytical focus of this work.
3. Research Methodology

3.1 Introduction

HIV & AIDS 's effects on agriculture can be explored from a number of angles using a variety of approaches and research methodologies. In the literature, studies of HIV and AIDS have focused on families living with the diseases, household farming system, national agriculture and agribusiness sector and the whole macro-economy as a whole. In exploring economic and social impacts of HIV & AIDS on agriculture, most studies have been partial in their focus and selective in their coverage of dimensions of impact often making it quite difficult to weave together all impacts into a consistent story. Some studies have taken the case study and documentary approaches which focus on a few households capturing their life stories of the devastating effects of HIV and AIDS their livelihoods. Publications of these case studies were effective in jolting policy makers into action and attracting global sympathy and resources for programs. Some have used representative survey approaches to ensure validity of scientific inferences from findings and these studies have been widely published and read by peers but perhaps have not been as effective in luring attention of policy makers. Other approach has been simulation of complex economy wide models that have yielded important macro insights on anticipated impacts of HIV and AIDS on growth of key sectors of the economy, national employment and terms of trade. But practical use for national planning has been limited to international agency level due to severe capacity and budgetary constraints in African governments and research institutions.

The remainder of this chapter outlines the research methodology in explicit detail. It begins by a description of the conceptual framework, which explicitly articulates the possible social and microeconomic impact channels linking HIV, and AIDS disease to agricultural production and food security performance of rural households. The conceptual framework lays bare the key impact areas, how they relate to HIV and AIDS and the type of empirical information required to verify these relations. This is followed by a brief and philosophical discussion of the analytical techniques proposed for the study to comprehensively explore the relationship versus those used in analysis contained in this study. Data collection approach and challenges are discussed next. The chapter ends with a brief discussion of processes and challenges encountered in the process of undertaking the study.
3.2 Conceptual Framework:

A Conceptual framework is a portrayal of understandings that will guide the research approach to evaluating the microeconomic impacts of HIV and AIDS on Smallholder Agriculture.

Smallholder agricultural sector is an integral part of the broader domestic macroeconomic system. HIV and AIDS can affect the domestic agricultural sector directly by attacking the people and range of their institutions serving their smallholder agriculture sector. The disease can also affect smallholder agricultural sector indirectly through its impact on non-agricultural sectors of the macro-economy including agribusiness that have a business relation with agriculture. Changes in the macro-economic performance fundamentally drive national macroeconomic policies, sector-specific policies and policy response of government. Thus even for a sector specific study of impact of HIV and AIDS on agriculture, it is important to articulate the impact of HIV and AIDS on the macroeconomic context under which the agricultural sector operates. Smallholder farmers in remain in agriculture within the context of the existing macroeconomic environment, which in most African countries have been a source of options for diversifying their livelihood options. Thus a comprehensive articulation of microeconomic impacts of HIV and AIDS on smallholder agriculture must necessarily represent a conceptual integration of the two sources through which HIV and AIDS impact on agriculture are conceivably channeled, viz:

(a) Macroeconomics and Policy Channeling of Impacts on Smallholder Agriculture
(b) Microeconomics and Social Chandelling of Impacts on Smallholder Agriculture

3.2.1 Macroeconomic Dimension & Micro Links to Smallholder Agriculture
When HIV and AIDS directly hit the non-agricultural sectors of the macroeconomic environment, how would the smallholder agricultural sector be affected? As the primary provider of labor to the non-agricultural sector, turnover from modern economy would lure farmers into wage employment. High cost of employing people living with HIV and AIDS would increase cost of supplies from the industry to agriculture and reduce open market prices for agricultural produces. Thus agribusiness firms that buy or sell to farmers will often reduce terms of trade against farmers when cost of doing business increases with rising incidence of HIV and AIDS in industry and commerce. Smallholder farmers will suffer higher input prices and lower producer prices for their commercial sales of agricultural produces. Urban employment will also suffer from reduced wage as average productivity of workforce declines and cost of employment increases.

Thus wage-employed members of the smallholder household will progressively earn less in an urban environment of escalating cost of living (due to rising prices of manufactured products from home industry). In response, he will progressive reduce remittances (wages net of living cost) to the rural home. When the remittance income declines below personal reservation level, the worker will quit wage employment and return to the rural home. However by that time - social scientists would argue - a combination of job related stresses would have long pushed most migrant workers into high risk activities such that they would be HIV/AIDS positive and suffering reduced earnings from work due to absentism. Thus HIV and AIDS dynamics in industrial sectors of the national economy has severe implications on the smallholder sector through its impact on migrant worker from the rural families. Other negative shocks on the non-agricultural sector include present economic recession will have similar impacts.

The second macroeconomic dimension worth exploring in the conceptual framework relates to government provisions to the agricultural sector, Agricultural policies and programs and public service. These provisions are affected by macroeconomic performance and government factors including its own perception and response to HIV and AIDS pandemic. Government sector provisions - agricultural sector policies and macroeconomic policies, agricultural service provision and general social service provisions - undoubtedly modulate the impact of HIV and AIDS on Smallholder Agriculture.

(i) Agricultural market and price policies: Zimbabwe and most African countries government use agricultural pricing policies as a way of raising or saving tax revenues for predatory rather than socially justifiable purposes. When agricultural policies offer farmers incentive prices - they can reduce vulnerability of smallholder households to HIV and AIDS risks and increase their financial capacity to adapt to HIV/AIDS impacts on farming system. Poor pricing policies just make farmers more vulnerable to HIV and AIDS risks and impacts.
(ii) **Agricultural support services.** Provision of agricultural research and extension services to smallholder farmers is a public good because of high transaction costs and low market share. Farmers rely almost entirely on public research and extension for new technologies and capacity building. When agricultural research and extension is well staffed and well funded, farmers are quickly informed and exposed to new appropriate technologies offering new and better technical possibilities for adapting to HIV and AIDS risk. However when governments are facing fiscal stress from macroeconomic decline, budget for research and extension services gets cut. Farmers are left on their own to adapt to the shock without the benefits of information from extension.

The third component relates to government management of **cross cutting macro economic policy** issues. Government monetary and fiscal policies affect macroeconomic environment - inflation, interest rate, wages, public service financing - which in turn affects performance of sectors of the economy. Government policies that cause macroeconomic instability compound the risk and impact of HIV and AIDS on Smallholder Agriculture. Macroeconomic instability undermines ability of smallholder farmers to withstand impact of HIV and AIDS- especially when the fiscal (or monetary) expenditures driving the instability is not benefiting the farmers nor financing HIV and AIDS programs. Response of government to HIV and AIDS through national funding of education and mitigation programs would also reduce magnitude of HIV and AIDS challenge and potential impact on agriculture.

### 3.2.2 Microeconomic Dimensions of Impact of HIV and AIDS on Agriculture

Many studies conducted on the impact of HIV & AIDS in Africa have focused on the farm-household level (du Guerney, 2001; HSRC, 2001; Mutangadura, Jackson and Mukurazita, 1999) where agricultural production by commercializing traditional smallholder farming population is often embedded within multiple-livelihood strategies and systems. Zimbabwe smallholder agricultural households have a tradition of taking advantage of the presence of remunerative employment opportunities in the urban economy. Thus male family members are expected to secure non-agricultural income sources as a source of diversified livelihood strategies. The chart below presents a conceptual flow of events illustrating the positive role that urban employment of male head plays initially in the capitalization and development of the rural household economy and subsequent negative role as the primary channel through which HIV and AIDS flows into the smallholder sector.
1. Male head of rural household migrates to urban center to secure a remunerative wage employment leaving his wife and children in the rural home engaged in semi-commercialized maize-based farming system. The rural home, benefiting from remittances acquires productive farm assets more rapidly and enjoys better access to higher yielding technologies from urban agribusiness. In exchange the household sells more surplus to these markets. The whole household enjoys better food security due to diversified income and livelihood.

2. Male head of rural household, overwhelmed by the stress of staying far from home and problems, succumbs to peer pressure and contracts HIV from risky extra-marital affairs in urban areas. The information about the HIV positive status is hidden to all including him. The status does not immediately affect earnings and so husband continues to remit to the rural home, building modern homestead and financing much more effective utilization of his whole farms. Male head visit are distant and far apart but remittance check is sent regularly. Female head in rural areas also passively contract the disease from her husband and father of her four children.

3. Male head of rural household still in urban employment but suffering from increased morbidity. He suffers reduced wage income due to increased morbidity-induced absenteeism from the urban factory. Female head spends time away from rural homestead attending to ill spouse in urban area. Crop harvest and income earnings from farm diminish due to her absenteeism from managing farm operations. Household loss in total income and food security though husband is still technically employed. Mandatory test at workplace reveals status and WIFE gets tested and also knows. But both receive nothing for treatment of condition. Husband is retrenched due to "absenteeism and poor productivity" and migrates back to the village to live with the disease.

4. Dark cloud hangs on the two-parent homestead with one dying and the other being occasionally sick. Performance of farming system and food security of family diminishes due to multiple stresses of reduced investment in farm inputs and heightened illness of male head. Family sell some cattle assets to sustain food security while husband is alive.

5. Male head dies. Wife remains ill under care of the four children one of whom is a young adult. Two beasts slaughtered leaving the family with 3 cattle. Farming system suffers from lack of inputs, draft power shortages and poor management. Poor productivity and shortage of food. Under utilized lands confiscated by village. Oldest child marries and leaves rural home to urban areas in search of urban job leaves wife in care of his ailing mom and of his orphaned siblings.

6. Mother dies. Rural household of eldest son takes off starting with more labor (3 brothers), inherited the well developed homestead, and some assets.
Farm HH

Urban-based
Family member

Agribusiness
industry

Farm HH with urban based
HIV member

HIV+ Urban member

Agribusiness
industry

Farm HH with urban based
AIDS member

AIDS Suffering
urban-based
member

Agribusiness
industry

Farm HH with resident
HIV & AIDS Members

No Family
member in
urban wage
market

Industry

Farm HH With HIV & AIDS
Deaths of heads

No family
member in
formal
employment

Agribusiness

Impact of HIV & AIDS On Livelihood of Afflicted HH cluster

Strategic Response by HIV & AIDS Afflicted HH

Community Response to the new cluster

Government/ NGO Response to the plight of HIV & AIDS Afflicted HH

Depends on
3.2.3 Operational Microeconomic Framework - Household -Livelihood

The best framework for conceptualizing the pathways by which HIV and AIDS affects smallholder agriculture is a combination of agricultural households model and the essence of the livelihood framework. The agricultural household model provides theoretically consistent framework for integrating the various pathways of impact that are informed by Livelihood Framework. Specifically it insists on consistency in articulation of the production, consumption and investment decisions, which are known to be non-separable due to the incomplete market environment under which smallholder agricultural households operate.

Figure 2.1, presents a diagrammatic summary of the main ways in which HIV and AIDS affects household choices. The schematic diagram shows the major microeconomic pathways that HIV and AIDS affects production and food security of agricultural households. HIV and AIDS will lead to possible changes in the following five clusters: Production and Employment choices; Consumption choices; Family labor; Investment Choice and Asset Wealth

When HIV and AIDS first hit the household it is conceivable that the initial or gross impact on the five core impact areas. But the household may then adapt to the HIV and AIDS shock. The key to adaptation is the access to viable options that mitigate impact of HIV and AIDS. Macro Dimensions discussed above define Institutional Environment under the conventional Livelihood Framework. HIV & AIDS solicit first level response from the afflicted person and his family. If the respondent is aware of his HIV status early then the most likely response is to make a rational decision on whether to take defensive and offensive medical and economic assurance measures.

The knowledge about the possible private and social damage of not attending to the disease and awareness of possible strategies determines choice of optimal reaction strategy. HIV & AIDS is a unique disease in that it is one of an increasing number of ailments for which there is no apparent cure. However even though there might not be a cure, knowledge about the disease itself such as rate of debilitation of sufferer and management strategies for prolonging active productive life despite the disease are important determinants of response strategies that are likely to be taken by the victims. Impact of HIV & AIDS on agriculture depends on stage of detection of HIV and AIDS. Ability of the informed victim to take mitigating measures such as formal insurance and informal insurance measures of increasing savings and asset accumulation during the early stages to smoothen consumption expenditures later when the disease incapacitates them. The fact that outcome of the disease depends on strategic reaction strategies of the household following early versus late detection implies that impact that the disease shall have on households shall be indeed dynamic.
For each impact area or cluster, the figure below provides specific details on micro areas affected by HIV and AIDS.

Fig 2.1 Impact of HIV & AIDS on Agricultural Households

The extent to which households shoulders the full burden of the disease in the short-run and long run depends on how the community around the HIV & AIDS affected households response to the crises. If
society rallies social networks to provide support to the victim, then household might not have to deplete its asset to poverty. There are clusters of households that share the same characteristics say that of a history of family members working in town rather than being on family farms, asset holdings, etc.

a) Issues in Using Household As Unit of Observation

Agricultural development profession has adopted a universal definition of a household as a *socially recognized unit composed of members of the same family who normally farm the same fields and eat from the food prepared from the same kitchen and make decisions that binding to all family members*. The trouble with this definition is the presence of polygamous families where family members eat from different pots but share the same father as head of family. Adult sons that are married and technically ought to have moved out to form their own offspring households sometimes remain in paternal forming a complex patriarchy family eating from the same pot and farming the same fields for economic and social reasons.

Critics are worried that the use of household as a unit of analysis does not explore intra household allocations of tasks and resources. Often biased against women and children led to increasing dissatisfaction of external observers about the norms within households.

The study of gender dimensions of power within the household is crucial in understanding the power relationships between male and female heads. The extent to which wives can insist on safe sex with their husbands requires education and understanding from both partners as it could be misunderstood to imply accusation of infidelity.

3.2.3 Specification of Impact Variables and Data requirement

To explore impact of HIV and AIDS on agriculture and food security, there is need for data on macro side as well as on the micro side. The specific data shall depend on defined impact variables. The Impact variables chosen by Zimbabwe for the Zimbabwe project include the following and all come directly from the conceptual framework

(a) Measures of HIV and AIDS Presence in households
   - Number of orphans, Morbidity: Number and frequency, weighted index of the ill
   - Mortality: Number of adult mortality
(b) Measures of Family Labor and Dependency Ratio
   - Family size, age composition; health profile
   - Number of dependence over number of adults
(c) Household Consumption Expenditures and Composition
   - Expenditure on food; expenditure on services
   - Expenditure total
(d) Measures of Household Crop Production Performance
   - Acreage by crop; yield by crop
   - Gross margin
(a) Measuring Household Food Security:
   - Income by source, profits
(b) Measuring of Household Savings and Investment Growth:
   - Sales, purchases
(c) Measures of household Asset Wealth Holdings:
   - Number of cattle, livestock by type, prices

3.3 Specific Analytical Techniques for Measuring Impact

The team focused on collecting cross sectional data, the general approach for analysis is a comparison of household affected by HIV and AIDS and households less affected by HIV and AIDS. Three types of analysis were planned and to date the first two have been used, viz

a) The qualitative Descriptive technique I

For each and every cluster of impact areas, a comparison of means and calculated indices is made between those households affected by HIV and AIDS versus those not affected by AIDS. Comparisons are further aided by graphing techniques. This method of comparison is easy to do but fairly limited in its interpretation. This often requires further analysis to verify importance of the factor.
b) Econometric Approach

For each of the major impact variables, the data is graphed to show the phenomenon that the analysis is trying to explain. Given that Zimbabwe had targeted sample of 327 households but the variability is bound to be too high for it to be fully explained by one variable. The econometric technique is employed to specify sound multivariate models. To explain observed variability among the explanatory factors for each of the phenomena measures of HIV and AIDS morbidity and mortality are included and their significance tested to see whether they are sufficiently important in accounting for observed variability in the presence of other variables known to influence the relationship.

Specific models shall be discussed under the separate analytical chapters.

c) Simulation Approach

One of the major weaknesses of the with and without approach to analyzing impact is that it lacks a temporal dimension when the impact of HIV and AIDS is necessarily dynamic. Simulation analysis is planned to explore the inter-temporal implications of HIV and AIDS infection in a household on lifetime agricultural production, consumption and investment decisions of households under a range of policy scenarios. The mathematical specifications of the household optimization problem as one of seeking to maximize lifetime income or family welfare versus planned drive household to make strategic adaptive investments and production and investment choices that are very different compared to the pattern of choices and investments made by the control group of HIV and AIDS free families.

3.4 Data Collection Process and Challenges

Zimbabwe team collected two types of data - secondary data and empirical survey data. Initially the country team had planned to undertake three surveys of empirical data to full cover the direct and indirect routes by which HIV and AIDS were conceptualized to affect agriculture - the individual household level, institutional level and macro level survey. Due to budgetary constraints, the team could only undertake one survey and chose to focus on household survey. The other two surveys have been incorporated into other studies.
The team believed that the three-layered approach would allow the study to come up with an understanding of the socio-economic impact of HIV & AIDS on food and agricultural sector for better policy analysis. Thus the team believes that results from the study shall be limited by the restrictions.

### 3.4.1 Description of the Study Areas and Sampling Frame

The country team originally intended to conduct Household survey in all agricultural provinces of Zimbabwe in order to produce one of the first truly national data set on impact of HIV and AIDS on African agriculture. Unanticipated changes in budget allocation to field work left countries with no options but to scale back operations. The country team chose to undertake the survey in two districts of two provinces.- Goromonzi District of Mashonaland East and Makoni District of Manicaland Province.

Working in collaboration with the District Community-Based Care, the team followed a stratified sampling frame targeting to interview at least 150 to 175 farm households among the affected households and a similar number among the less affected household. For ethical reasons, the team had to ask for permission from interviewed households if they wanted to be part of the study and also if they wanted to put any form of restrictions on how the information will be used. It was surprising how open about their conditions most households were. This made survey relatively easy to execute. Within the study area, the census of affected was used to pick target randomly sample. Then the local caregivers would validate the selected families according to their state of health eliminating those that were too sick to participate. Only less than ten households were affected by this screening. A total of 350 questionnaires were completed and after cleaning only 329 were complete of which 57% were for affected families.

A team six enumerators undertook the survey in both areas

The questionnaires were entered and cleaned using SPSS - a software which was used for almost all analysis.
3.3 Research Team and Collaborating Partners

Originally FANRPAN Zimbabwe had assembled a multi-disciplinary collaborative team with specialists coming from 4 institutions, which had agreed to take part in the research. The reason for such an approach was to link the research activities directly to the national HIV & AIDS intervention programs and development policy planning units of government and NGOs. However when the project was severely scaled down, most of the members dropped out.

The Original Team:
(a) 3 Economists (from the University of Zimbabwe, 1 from Civic Group)
(b) 1 sociologist (from one of the NGOs or union involved in HIV & AIDS social work planning)
(c) 1. Agricultural Policy Planner (from Ministry of Agriculture, GOZ)
(d) 1 program manager from active HIV & AIDS intervention programs (from NGO community)

The Final Team:
(a) 1 Agricultural economist and agricultural policy specialist (UZ-Agric)
(b) 1 Macro economist and health economics specialist (UZ-econ)

The project also employed one full time research assistant and during the first year one contract research officer to assist the two principal researchers

3.4 Collaborating Institutions and Organizations

In Zimbabwe, there is a well-established network of public, civic and private organizations involved in various HIV & AIDS programs across the country. The national civic organizations funded by government all operate under the banner of the National AIDS Council, which disseminates special funds, generated through the national levy to combat HIV & AIDS. In addition to the national organizations there is also a host of international NGOs working in the area of HIV & AIDS.

FANRPAN Zimbabwe core research team on HIV & AIDS study established collaborative partnerships of varying intensities with the major institutions with HIV & AIDS programs in either communal- or commercial farming areas. The team shall also form strategic alliances with policy-making institutions such as Government Ministries of Health, Social Welfare and Agriculture and quasi-governmental policy institutions such as the National Aids Council, policy wing of the National Economic Consultative Forum (NECF). The nature and intensity of collaborative relationship with FANRPAN shall
be defined by both parties to ensure mutual benefits and to optimize FANRPAN-Zimbabwe’s contributions to national policy debate on HIV & AIDS impact on agriculture.

### 3.4.1 Principal Collaborating Institutions

The criteria for selecting principal collaborating institutions are shared interest in the research agenda. The team also tried mobilizing extra financial with limited success.

<table>
<thead>
<tr>
<th>Type of Organization</th>
<th>Names of Potential Principal Partners</th>
<th>Potential Contributions to the FANRPAN Study</th>
<th>Potential Benefits From the FANRPAN Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>International NGOs</td>
<td>(1) World Vision (2) AFRICARE (3) CARE (4) Action-Aid</td>
<td>(i) Access to HIV &amp; AIDS programs in their service areas (ii) Might possess local data bank on farming families differentiated by HIV &amp; AIDS status</td>
<td>(1) In depth technical input on their M&amp;E programs (2) Access to results an independent study done by professional team (3) Access to FARNPAN’s regional network of researchers</td>
</tr>
<tr>
<td>Local Civic Groups</td>
<td>(4) Catholic Relief(CRS) (5) National Aids Council (6) GAPWUZ</td>
<td>(i) Access to data bank on farmers and farm workers (ii) Access to farm workers</td>
<td>Ditto</td>
</tr>
<tr>
<td>Farmer Organization</td>
<td>(6) Zimbabwe Farmers Union</td>
<td>(i) Strategic information farmers in all areas and hypothesis on impact of HIV &amp; AIDS</td>
<td>Policy Briefs and working documents on impact of HIV &amp; AIDS on farmers and farm workers and mitigation pathways and strategies</td>
</tr>
<tr>
<td>Government Departments</td>
<td>(7) Ministry of Agriculture (8) Community Based Health Care Division of Ministry of Health</td>
<td>Access to farm communities Local area statistics on past performance of sector in 1980s vs 1990s</td>
<td>Policy Briefs and working papers on HIV &amp; AIDS Impact on Agric</td>
</tr>
</tbody>
</table>

### 3.4.2 Other Stakeholders

There are many other organizations that have a vested interest in the research work and which could want to use the results for their own policy making and planning purposes. Not all of these organizations were sufficiently interested to participate actively in the FARNPAN research team. Also FANRPAN Zimbabwe was sensitive to the limited operational budget cost of carrying along such organizations especially given the rising cost of organizing planning meetings and workshops.
4. Macroeconomic Perspective: National Response to the HIV & AIDS Epidemic

4.1 Introduction

The HIV & AIDS epidemic is a health and development crisis in Zimbabwe. In the year 2003, 24.6% of the entire adult population (ages 15-49) was affected by HIV & AIDS. This means that 1.8 million people out of 11.6 million people are affected by HIV & AIDS while an average of 2 500 people per week die as a result of HIV & AIDS making Zimbabwe one of the most seriously affected countries in the entire world. 32% of the Zimbabwean population lives in urban areas, 58% in rural areas and 10% in other areas (this category includes large scale commercial farms, growth points, administrative centres, mining areas, state land and army encampments). Prevalence rates according to residential areas show that HIV & AIDS prevalence is highest in “other” areas where 35% of adults living in these areas are HIV positive. Prevalence rates in urban and rural areas are 28% and 21% respectively. As a consequence of HIV & AIDS, 1.14 million children have been orphaned.

4.2 Trends in HIV & AIDS incidence and prevalence rates.

The number of HIV & AIDS cases has been increasing at a dramatic rate. The Ministry of Health and Child Welfare reports that the number of HIV infected persons rose from 390 000 in 1988 to 1.8 million in the year 2003. Figure 1 below shows the trends in HIV prevalence since 1988.

![Fig 4.1: Trends in HIV prevalence in Zimbabwe](image-url)

The number of annul new AIDS cases also rose from 16 000 in 1988 to 180 000 in 2003.
2003. Projections are that AIDS incidence rate will continue to increase with roughly 490 people being expected to develop AIDS every day between 2003 and 2018. Trends in the incidence of AIDS are shown in Figure 2 below.

![Graph showing number of new AIDS cases from 1988 to 2003.](image)

**Fig 4.2: Number of new annual AIDS cases**

HIV & AIDS has become the major sources of mortality in Zimbabwe. By the end of 2003, 1.5 million Zimbabweans had died of AIDS and 2.7 million more are likely to die from the disease by 2018 in the absence of widespread use of antiretroviral drugs. Even if HIV prevalence were to fall to zero by 2010, there will still be an additional 1.6 million AIDS deaths between 2003 and 2018. Annual AIDS deaths rose from 12,000 in 1988 to 177,000 in 2003. This translates to an over 14-fold increase in HIV & AIDS related deaths.
4.3 The national response to the pandemic

The statistics above show that HIV & AIDS should be a cause for concern for the nation hence an appropriate national response is called for. Not only should the concern be on HIV & AIDS as a health problem but as socio-economic problem as well. AIDS has far reaching impacts on vulnerability to other diseases, the fiscal budget, agriculture and food security and the social structure of the country. According to the Ministry of Health and Child Welfare (MOHCW), the number of TB case rose by 400% between 1990 and 1999. This surge is attributed to increased HIV infections. As of 1998, the costs of conventional care for HIV and AIDS related illnesses were estimated to increase the MOHCW budget by 60%.

Agriculture has not been spared from the negative impact of HIV & AIDS. 21% of the adults living in communal areas are infected and 35% of people living in resettlement areas and commercial farms are also infected. These areas form the core of agriculture activities. The chronic illnesses that accompany the deterioration of the immune system due to HIV lead to the depletion of household assets and reduction of labour. Reduction in crop production will thus be inevitable. There are also other social effects of HIV and AIDS for example the increase in orphans and child headed households. All these called for action to be taken against the disease.
4.3.1 Government response
The government responded to the growing need for intervention in HIV and AIDS. The response started with the realization that HIV & AIDS is a problem that threatened both the social and economic existence of the population. Government’s response was in the form of legislation which created an enabling environment for intervention and Programs that were meant to mitigate the impact of HIV and AIDS.

4.3.2 Legislation
In response to the HIV & AIDS pandemic, the government of Zimbabwe initiated the development of a national HIV and AIDS policy through a broad consultative, consensus building process with stakeholders in all parts of the country. The end result was the launching of a National Aids Policy in 1999. The policy is based on the following guiding principles:

- HIV & AIDS is a serious public health, social and economic problem that requires to be addressed as a major priority through individual and collective actions;
- Information on behaviour change is a cornerstone for prevention and control of HIV;
- The need to counter and avoid of discrimination and protecting the human rights and dignity of PLWHA (people living with HIV and AIDS);
- Providing care and counseling is essential to minimising the social impacts of AIDS;
- Sensitivity to gender equality;
- Action research;
- Supportive environment at every level of the society;
- An appropriate national AIDS coordination and advocacy is essential to oversee further policy development and implementation.

The launching of the National Aids Policy paved way for the establishment of the National AIDS Council through an Act of parliament in 1999. The main functions of the National AIDS council are to:

- Ensure the development of strategies and policies to combat HIV & AIDS and control the effects of the HIV & AIDS epidemic as well as controlling and coordinating such strategies.
- Mobilise and manage resources in support of a national response to HIV & AIDS.
- Enhance the capacity of various sections of the community to respond to the HIV & AIDS epidemic and coordinate their responses.
- Promote and coordinate research into HIV and AIDS and ensure the effective dissemination of the results of such research.
In that same year the government introduced the AIDS Levy, which required that individual and companies pay 3% of their taxable income and corporate tax to the National Aids Trust Fund (NATF). Since January 2000, $8 billion has been collected through this levy. These funds have been utilised in the training and support of care givers. They were also used for supporting social mobilisation and awareness, orphan support, inputs for child headed families and supplementary feeding for AIDS patients. The (NATF) focuses on projects in the following areas: prevention, care, mitigation and research. It prioritises for funding lead organisations that have necessary human resources and the relevant knowledge in HIV & AIDS. It also prioritises projects that are planned with the participation of target groups.

4.3.3 Programs

In 2000, the National AIDS Coordination Programme led to the development of the National HIV & AIDS Strategy Framework, a strategic plan that includes specific goals and targets. Prevention is the cornerstone of the strategic plan. HIV is primarily transmitted through heterosexual contact. Most of the efforts have to be aimed at changing high-risk sexual behaviour. One notable campaign on HIV prevention is the ABC (Abstinence, Being faithful and Consistent condom use) campaign. Primary policies and strategies that are aimed at limiting sexual transmission of HIV are to:

- Promote delays in onset sexual activity among youth
- Promote abstinence outside marriage and faithfulness within marriage and steady relationships
- Make safe sex a normal behaviour in all relationships that pose risk for HIV transmission
- Promote timely and comprehensive treatment of sexually transmitted diseases
- Make condoms available, accessible and affordable to all sexually active individuals who wish to use them
- Make HIV counseling and testing services available and accessible to all members of the public
- Changing cultural practices that increase the risk of HIV transmission.
- Develop innovative behavioural change communication to reach key groups with factual and effective communication.
- Make information on interventions to reduce mother to child transmission widely available, especially to pregnant women.

The last strategy listed above was the last to be implemented by government. The current PMTCT program (prevention of mother the child transmission) through the use of nevirapine is still in its infancy and
applied to only a few selected areas. Nevirapine is yet to be made widely accessible to all HIV infected pregnant women and it is still on a voluntary basis. The government started to make allocations for the purchase of ARVs in 2003 when it allocated $2.5 billion for this purpose. The figure increased to $10 billion for the year 2004. The strategies on PMTCT aim at ensuring access to VCT (voluntary and counseling and testing) for couples contemplating to start families and ensure access to antiretroviral (ARVs) treatments for HIV-positive pregnant women.

Although the main focus of the response is on prevention, there are also strategies for treatment and care of HIV and AIDS patients. These include

- The improvement of the capacity of the health care system to treat and care for the PLWHA. This includes expanding the availability of ARVs.
- To improve the capacity of households and communities to take care of their sick. The NAC is disbursing funds for training and purchase of home based care kits and bicycles for caregivers through Districts AIDS Action Committees in all districts of the country.
- To establish economic and safety nets for individuals, households and families affected by AIDS-related mortality.

4.3.4 Expenditures

Initial budgetary allocations for HIV & AIDS were made in the 1997/98 budget when a $10 million provision for the National AIDS coordination programme was made. This was then followed with consistent allocations for the HIV & AIDS/STD/TB programme and HIV & AIDS test kits since the year 2000. It is however disappointing that some of these funds were under utilised e.g. only $14.5 million of $95 million allocated for the HIV & AIDS/STD/TB programme was used in 2002. In the same year only $30 000 out of $39 million set aside for HIV test kits was put to use. Funds for research on HIV & AIDS were made available in 2002. This allocation was not spared from under utilisation as well. In the year 2003, the government also started to set aside funds specifically for the purchase of ARVs as mentioned above. This move was a welcome development although more funds have to be mobilised for this purpose. The 2004 allocation amounted to $ 5 500 per HIV infected person. This is barely enough to purchase a one-day dosage for one infected person. This has resulted in selected access to ARVs with a bias against the poor. In light of this, there is need to ensure cheap and universal access to ARVs. This can only be achieved if more funds are allocated for their purchase and moving towards local production of the drugs.
4.4 Non-state actors’ response

Non-state actors were also not left behind in the national response to HIV & AIDS. The HIV & AIDS sector has now become the sector with the largest participation of Non-governmental organisations (NGOs). There are over 350 NGOs involved in intervention on HIV and AIDS in Zimbabwe. These NGOs are engaged in the fight against HIV and AIDS in various complementary capacities but they can be easily divided into three categories namely support organisations, networks and “grassroots” organisations.

Fig 4.4: Distribution of NGOs in the HIV & AIDS sector according to functions

Support organisations provide funding and technical assistance for organisations participating in set out areas of HIV and AIDS intervention. A good example is an organisation like Island Hospice, which is an international institution providing funding and training assistance for NGOs involved in home, based care. Other examples of such organisations are AFRO-NETS and VSO. The common feature of these institutions is that they have planned programs for interventions, rather than implementing these programs directly, they provide support (mostly financial) for other NGOs willing to intervene by implementing such programs.

National AIDS networks organisations are membership-based organisations providing a forum for coordination and information exchange among members to enhance the national response to HIV and AIDS. The membership of these organisations comprises other NGOs participating in the HIV & AIDS sector. Besides providing technical assistance to their membership, networks in this sector also mobilise
resources for their members and advocate on HIV & AIDS issues. Examples of such organisations are ZAN, SAFAIDS, NAC, SANASO and NANGO.

The grassroots organisations are those institutions involved in the direct implementation of intervention programs and they form the bulk of NGOs involved in the HIV & AIDS sector. These NGOs are linked directly to their target groups and they oversee the day-to-day formulation and implementation of intervention programs. Most of these organisations however are donor dependent as they rely on the financial support of other institutions for successful implementation of their programs.

4.4.1 Coverage

Although the coverage of these organisations is widespread, there is much concentration in Bulawayo, Harare and Manicaland. The distribution of the NGOs according to province is shown in Figure 5 below.

The Matabeleland region as a whole has the largest number of NGOs (156 of the 320 NGOs affiliated to ZAN) participating in the HIV and AIDS sector. This is followed by the Mashonaland region (147) while Masvingo (57) has the least number of NGOs involved in the intervention of HIV and AIDS. The metropolitan (Harare and Bulawayo) provinces receive the widest attention. Prevalence rates stand at 28% of the population living in these areas. These areas are attractive to NGOs due to their accessibility because of better infrastructure as well as access to the media. Reaching target groups is thus easier.
Rural and farming areas have always been left behind in most initiatives. It will be interesting to look at rural and farming areas coverage by these NGOs. Intervention in these areas is also made necessary by the high prevalence rates (35% of adults) in farming areas thus calling for intensive coverage of such areas. In addition, the combined population in these areas constitutes 68% of the total population and these people are poor and usually lack the means to fight against the disease. Reaching these areas will not only result in reaching the majority of the population but also the most disadvantaged section of the population not withstanding their contribution to food security. From the ZAN membership area coverage, 61 rural and farming districts are covered in all the provinces. As Figure 6 below shows, Mashonaland has the most number (22) of rural and farming areas covered followed by Manicaland with 16 rural and farming areas covered.

![Distribution of rural and farming areas covered by province](image)

**Fig 4.6: Distribution of rural and farming areas covered by province**
4.5 Intervention strategies and their success

Intervention strategies being employed by NGOs participating in the HIV & AIDS sector can be divided into four major categories namely (i) prevention (ii) people living with HIV and AIDS, (iii) vulnerable groups and (iv) advocacy. These strategies are explained below.

4.5.1 Prevention

The intervention strategies on prevention have the reduction in the spread of HIV as the major goal. The key to this is encouraging behavioural change in target groups to curtail the number of HIV infections. They aim to achieve this through peer education, voluntary counseling and testing and raising people’s awareness on HIV and AIDS.

a) Peer education and HIV and AIDS awareness.

This strategy aims at promoting behavioural change through communications intervention. This involves reaching out the target groups (the youth being the major focus) and informing them about the deadly effects of AIDS, the methods of transmission and ways of preventing the transmission of HIV. The objectives of peer education are to

- Promote safer sexual behaviour among youth specifically and the general population by increasing the proportion of people who abstain, practice mutual monogamy, have fewer sexual partners and use condoms.
- Increase the proportion of people who want to know their HIV status
- Improve attitudes on gender and sexuality by encouraging equality and communication in sexual decision making
- Encourage open discussion on HIV, AIDS and STIs so as to reduce the misconceptions that reinforce high risk behaviour
- Discourage cultural practices that increase the risk of transmission of HIV.

The ABC campaign (spearheaded by the MOHCW and PSI) mentioned above is the major tool employed so far. The ABC program advocates for Abstinence, Faithfulness and Consistence in condom use.

The Jesuits AIDS project is a good example of peer education aimed at behavioural change. This NGO advocates for abstinence as the best way of preventing the transmission of HIV. “Say NO to sex
before marriage” is the motto of this strategy. It focuses on the youth with the aim of encouraging them to abstain from sex before marriage. Females are the targets of this message as they are deemed to have the final say in the decision to have sex. The message is spread through posters in clinics, schools and other public areas as well workshops and seminars with youth mostly at schools.

The Midlands AIDS Service Organisation has also done a lot to promote abstinence among youth through youth programs. They aim to educate youth on HIV and AIDS and advocate for youth to avoid sex outside marriage. They also aim to delay/postpone the age at which youths become sexually active. The Zimbabwe Young Adult Survey, 2001-2002 (YAS) reported that 55% of women aged 15 to 24 are sexually experienced and among men, 50% of 15 to 24 year olds are sexually experienced.

Abstinence from sex has proven to be difficult so the alternative is the consistent and proper use of condoms. NGOs with this program intervene by ensuring widespread distribution as well as convenient and cheap access to condoms. Safe sex is encouraged to reduce the spread of AIDS and this involves ensuring access to condoms and educating people on their proper use. YAS reported that 15% of women and 47% of men reported condom use during last sexual intercourse. This reveals low use of condoms despite their widespread availability. The faithfulness element of the ABC campaign discourages multi relationships and encourages people to stick to one partner. According to YAS, 66% of women aged 25 to 29 years had single lifetime partners, 30% had two or three while 4% had more than three partners. Among men of the same age group, 22% reported a single partner, 32% two or more and 36% had more than three partners. (10% failed to answer the question)

According to the USAID, 98% of the population is aware of HIV and AIDS. However awareness has not led to the reduction of HIV and AIDS prevalence rates.

b) Voluntary Counselling and Testing

Voluntary counseling and testing (VCT) is the process by which an individual undergoes counseling, enabling him or her to make an informed choice about being tested for HIV. This program is based on the principles of confidentiality, voluntary participation, pre and post testing counseling to all attending people and equal treatment to both HIV positive and negative people. The program encompasses the following

- pre –testing counseling to educate people on the necessity of knowing their HIV & AIDS status and equipping people to accept their results by making people understand that they can live positively
- HIV testing
- Post counseling to provide support to those who are positive and enable them to live positively with HIV.

VCT is not only a key component of both HIV prevention and care programmes but is the gateway to both prevention and care. In order to respond effectively to options for each, it is preferable for one to know one’s serostatus. The development of increasing numbers of effective and accessible medical and supportive interventions for people living with HIV & AIDS (PLWHA) means that VCT services has become increasingly important for target groups to be able to access them.

**VCT as an entry point for prevention and care**

Adopted from UNAIDS Best Practice Collection, June 2002

Knowledge of serostatus through VCT can be a motivating force for HIV-positive and -Negative people alike to adopt safer sexual behaviour, which enables seropositive people to prevent their sexual partners from getting infected and those who test seronegative to remain negative. This intervention also facilitates access to prevention services for seronegative people and is a key entry point to care and support services for those who are HIV-infected.
A notable example of this program in Zimbabwe is the NEW START, a program being implemented by Population Service International (PSI). There are about 20 New Start Centres across the country providing VCT. The network has seen over 300,000 clients through June 2004 and the average number of monthly clients served has increased from 230 in 1999 to 13,000 in 2004. Thus the VCT program has been successful in the country as more people are increasing willing to be aware of their HIV status. However, according to the latest Zimbabwe Human Development report it seems that this success is limited to urban areas only. Pact, a US-based NGO recorded only 50 to 108 visitors a month on its two VCT centres located at Regina Coelli Mission in Manicaland and St Theresa’s Mission in Masvingo province.

4.5.2 Persons Living with HIV and AIDS (PLWHA)

Interventions falling under this category aim at mitigating the impact of HIV and AIDS on those infected by the virus. Strategies include home-based care, PMTCT, nutrition, Agriculture and income generating projects and skills training. These are meant to take care of PLWHA and lessen the burden of HIV and AIDS on this group.

a) Home based care

The objective of the program is to ensure access to proper care, drugs and nutritional food by HIV & AIDS patients. This program involves palliative care i.e. “active total care of patients whose disease is not responsive to curative treatment” and control of pain of other symptoms and of psychological, social and spiritual problems is paramount”. The objective of the program is to ensure access to proper care, drugs and nutritional food by HIV & AIDS patients. Home-based care programs involve the following activities

- Distribution of food supplies such as maize meal, corn, soya, pulses, cooking oil and soap to PLWHA.
- Support Visits for washing and cooking for patients, counseling services, assisting clients to visit clinics, training primary health careers in correct procedures, safety and hygiene for themselves and patients and providing psychosocial support to family including debriefing and education
- Training caregivers in basic first aid, infection control, hygiene and nutrition, palliative care including bereavement, home based care, basic counseling skills for current and new recruits, ART literacy training including diagnosis and syndrome management for current and new volunteers


NGOs have managed to implement this program nationwide, even in rural areas. The strategy has been a success because of its simplicity in implementation and has gone a long way to lessen the burden of HIV and AIDS patients. The training given to caregivers has also deepened people’s understanding of the disease and hence tolerance of PLWHA.

b) PMTCT

In Zimbabwe, it is estimated that 33% of pregnant mothers are HIV-positive, and that 250,000 children are already infected. Making PMTCT a feature of routine prenatal care in Zimbabwe has thus become a major tool for reducing these numbers. PMTCT targets HIV positive mothers with the aim of preventing the transmission of HIV to children at and after birth by providing nevirapine to HIV positive mothers. Following clinical trials in Uganda, researchers determined that the drug Nevirapine reduces HIV mother-to-child transmission by nearly 50%.

**PMTCT strategies include:** *primary prevention of HIV among future parents; improved access to family planning services and information for HIV-positive parents; and prevention of HIV from mother to child when the mother is HIV-positive*. The PMTCT program involves

- providing improved access to VCT services and establish the feasibility and acceptability of rapid on-site testing;
- implementing the HIVNET012 regimen for prevention of MTCT (a single oral dose of Nevirapine, self-administered by the mother at the onset of labour and a single dose administered to the baby within 72 hours of delivery);
- modifying midwifery practices to minimize the risk of MTCT, e.g. avoidance of rupture of membranes, Nutrition guidance episiotomies, and of oral suction of the newborn infant; and
- ensuring safer infant feeding practices for HIV-positive women.

There are only a few NGOs involved in this program. Only four out of 320 members of ZAN are involved in PMTCT. The major obstacle to this program might be the cost of acquiring ARVs. The key implementer of this strategy is the MOHCW supported by the J F Kapnek Trust, the first non-governmental organization to deliver a Nevirapine-based intervention in Zimbabwe. Plan international also supports this program. Although these institutions are trying their best, Nevirapine is yet to become widely accessible to all HIV positive pregnant mothers a situation exacerbated by most pregnant women’s ignorance of their
HIV status. 90% of people infected with HIV do not know their status\(^4\). The success of this program hinges on the success of VCT for pregnant women, as this is the first step in the implementation of the PMTCT strategy.

c) Training and Wellness Campaign

This programme is aimed at management in commercial and industrial enterprises on awareness and education. Management is encouraged to provide proper HIV & AIDS work place programmes for care and support of employees. This emphasises the need to regard and treat HIV as just one of the many illnesses and conditions that can be prevented and managed through adoption of a correct diet and a holistic life style. The Centre is one organisation that has made a notable contribution for this strategy. They assist management in setting up a four-stage welfare plan beginning with nutritional support, and then subsidized prophylaxis and treatment for opportunistic infections followed by the provision of antiretroviral treatment.

d) Nutritional Guidance

The Nutrition program provides education, information and support to clients on good nutrition. Nutrition is one of the cornerstones of the “Holistic” approach to managing HIV & AIDS for the following reasons:

- A good diet enhances/boosts the immune system.
- First line treatment to HIV related illness.
- Good nutrition prolongs the lives of PLWHA.
- Improves self-efficacy & confidence.
- Metabolism rate is higher in HIV positive people as such, the “Little and often eating effect” is effective.
- Nutrition compliments all other therapies very well e.g. most medications are written “Take with food or after food.”

There is also another angle to nutrition guidance, that of nutrition gardening. This is associated with the principle of healthy eating therefore intervention strategies in this regard promoting (i) Culinary and medicinal herbs, (ii) Establishment of herb gardens in homes and (iii) Drying of vegetables and herbs. The Makoni Tea, a program run by The Centre in Makoni District, is a good example of intervention through nutritional gardening.

\(^4\) NAC, December 2003
e) Agriculture and Income generating projects

Under this strategy, the resourcefulness of PLWHA as well as Vulnerable groups is increased. The strategy’s objective is to enhance the ability of both infected and affected people to sustain their livelihoods. Agriculture support takes the form of inputs support and technical support to promote maximum and efficiency use of resources at hand. Most of the NGOs intervening this way give seed handouts to HIV and AIDS infected and affected groups. The success of this strategy is doubtful because of the doubtful selection criteria of recipients of these handouts and the inability of targeted groups to use them. Even if seed is provided for example, these people cannot put them to use when they lack drought power. Often a time, this support is incomplete, as those provided with seed also need fertilizer. Giving them only one of these two inputs will not lead to any yields improvements.

Support through income generating projects involves provision of material support to PLWHA so that they can set up micro-projects, such as goat rearing, which will boost their incomes. Such incomes can then enable PLWHA to afford basic necessities they lack. This strategy is quite important as it goes a long way in improving the living standards of both people who are affected and those infected by HIV and AIDS. At times these projects enhance the ability of these people to sustain themselves.

f) Skills Training

For this intervention strategy, PLWHA and Vulnerable groups go through informal education where they are taught survival skills and other skills that will enable them to successfully carry out income generating projects. The major objective of this strategy is improving the capacity of PLWHA to help themselves and sustain their livelihoods.
4.6 Vulnerable Groups

Vulnerable groups are those affected by HIV and AIDS. They bear the burden of the consequences of HIV and AIDS even if they are not infected themselves. These includes people who are robbed of their bread winners due to AIDS related deaths and illnesses and those who spend most of their time caring for bed ridden AIDS patients thus completely changing their lifestyles. One group severely affected is orphans and vulnerable children.

4.6.1 Orphans and Vulnerable Children

As of 2003, HIV and AIDS had orphaned 1.4 million children. Most of these children are under the care of their grandparents who have no means to sustain their livelihoods. Intervention is therefore targeted at providing material help to these groups so that they can lead normal lives. This support includes clothes and food handouts to both the children and grandparents who provide care for them, financial support to orphans and children’s homes and enabling these children to have access to education by paying their school fees. Associated with the rise in the number of HIV & AIDS orphans is the rise in the number of child headed households. Intervention strategies for these households other than material support just mentioned have been discussed under Agriculture and income generating projects above.

4.7 Advocacy, Research and Information dissemination

These strategies are aimed at changing behaviour, attitudes and the environment in which PLWHA and NGOs operating in the HIV & AIDS sector operate. This is achieved by lobbying for accommodating legislation with regard to HIV and AIDS and adoption and implementation of given interventions by the government. Research and information exchange provide information to both PLWHA and participants in the HIV & AIDS, which will be useful for identification of areas of needs and most appropriate intervention strategies.
4.7.1 Advocacy

NGOs involved advocate and lobby on issues concerning treatment access, patient’s rights and Greater Involvement of People Living with HIV & AIDS (GIPA) through treatment literacy seminars and workshops. The major purpose of this strategy is to restore dignity and status of people living with HIV & AIDS *(life threatening illness)* in their communities. Currently focus is on four critical areas

- G.I.P.A from principle to practice;
- Access to affordable care and treatment;
- Human rights of infected & affected people and
- The Creation of an enabling environment to deal with stigma and discrimination effectively.

Advocacy has been successful; the major highlight being the launch of the female condom in 1997 after a petition was presented to the MOHCW. Currently the Citizens Aids Survival Trust (CAST) is lobbying for changes to be made to the Public Health Act so that special measures on the prevention and eradication of HIV and AIDS can be incorporated.

4.7.2 Research and Information dissemination

This covers research on new treatment methods and intervention strategies as well as facts about HIV and AIDS in the country. This information is then made available for use by the state and other NGOs involved in the intervention of HIV and AIDS so that appropriate interventions can be adopted.

4.8 Distribution of NGOs according to activities

The impact and cost effectiveness of intervention strategies discussed above are different. Their appropriateness also differs according to the social setting, objective and target groups. The distribution of NGOs according to activities shows the strategies that are being emphasized. This distribution is shown in figure 7 below. The most widely implemented programs are Home based care (80 out of 190 organisations whose information on programs is provided), VCT (63) and Peer education and HIV & AIDS awareness (60) followed by Orphans and vulnerable children. Participation is lowest in PMTCT, nutrition, agriculture and income generating projects and skills training.
Fig 4.7: Distribution of NGOs according to activities
*NB: The figure is based on the membership of ZAN.

This distribution reflects that focus on PLWHA lies on treatment and care with little being done to enhance the capacity of these people to sustain their livelihoods. Help is provided in the form of material support to both infected and affected people making these people more and more dependent on charity.

4.9 NGOs’ intervention strategies and agriculture

The first step to this analysis is to look at the intervention programs of NGOs in rural and farming areas and then look at their suitability in mitigating the impact of HIV and AIDS on agriculture. Figure 8 below show the participation of NGOs according to activities/programs in rural areas.

The most widely implemented intervention program concerns orphans and vulnerable children (implemented in 27 of the 61 rural and farming areas). Considering that the majority of orphans who lose their parents due to AIDS are cared for by their grandparents in rural areas, this seems justified. However the activities of the program itself may have little or no bearing on agriculture. As discussed above, the
support provided is incomplete most of the times and at times not in the necessary from to help in improvements in yields for this group. Peer education and HIV & AIDS awareness and VCT are the second widely implemented strategies (covered in 23 areas). The success of this program in rural and farming areas may be doubtful considering the statistics provided on VCT attendances in rural areas. As a result, HIV prevalence may not change thus the disease will continue to have its deadly impact on HIV and AIDS.

Fig 4.8: Participation of NGOs in rural and farming areas according to programs.

Home-based care is being implemented in 31% of the rural and farming areas. This program, although highly beneficial to PLWHA, may have a significant negative impact on agriculture production. This program requires the participation of able-bodied people in giving care to HIV and AIDS victims, bed ridden in most cases. This is time consuming and transfers labour from agriculture production to caring activities. The time spent caring for HIV and AIDS victims can be costly especially during the rain season inevitably leading to the drop in output.
PMTCT, Agriculture and income generating projects, nutrition, skills training and research and information exchange are all being implemented in less than five of the 61 rural and farming areas covered by the NGOs affiliated to ZAN. For agriculture, this should be a great cause of concern because there is a clear lack of programs that boost agriculture production in areas where such programs are greatly needed. This shows that intervention programs that are in place do little to mitigate the impact of HIV and AIDS in agriculture and help rural people to be self-sustaining. Much still has to be done in rural areas in order to boost agricultural production which in itself is a key component of the well being of both PLWHA and people affected by the disease in rural and farming areas. Rather than making these people more and more dependant on handouts, interventions should focus on restoring the capacity of these people to produce and thus sustain their livelihoods.

4.10 National Challenges

Despite the efforts of both the state and non-state actors in mitigating the impact of HIV and AIDS, there are still some areas of intervention on which much work has to be done. Some of these are listed below.

- Increasing the amount allocated for treatment and care of HIV and AIDS patients.
- There is still a lot to be done to ensure widespread and equitable access to ARVs for HIV and AIDS victims at a low cost
- Reducing sexual activity outside marriage by youth and reducing the tendency to be involved in multi-relationships by most males aged between 15 to 29 years.
- Raising the willingness of rural folks to participate in VCT.
- Expanding the prevention of parent to child transmission.
- Streamlining of activities of NGOs in rural areas so that intervention programs promote sustainable agriculture.
- Building the capacity of rural people affected or infected by HIV and AIDS to lead sustainable livelihoods.

4.11. Macroeconomic Impact of HIV & AIDS

The impacts of AIDS on the household vary, but constitute the bulk of research, which has been undertaken to date, and generally include;
• Loss of income, remittances or productive labor leading to increased poverty and poorer nutrition due to prime-age mortality and morbidity;

• Increased expenditure on health care, transport and funerals;

• Drawing down on savings and sale of assets to cater for costs like medical bills and transport;

• Increased workload on women and children who usually take care of the sick;

• Emotional stress and loss;

• Stigma and isolation; and

• Reduced expenditure on food, clothing, schooling as the available resources are strained to meet various household needs

Some of the above areas have been explored to some length in this study. However what is most interesting is the impact of HIV and AIDS on larger economic systems, that is, impact on regional and national economies. In this section the epidemic’s impact on the Zimbabwean economy is explored through a descriptive framework of macroeconomic simulations.

4.11.2 Macroeconomic Impacts in General

The extent to which AIDS affects the national economy depends on complex factors and establishing the extent of this impact depends on how the macroeconomic indicators are measured. To date insufficient research has been done in this area. Linked with reducing GDP, the main macroeconomic impacts include;

• Reduced national savings and investment critical for economic growth

• Increased spending on health at the expense of productive sector investment and spending due to HIV and AIDS related illnesses

• Slower skills accumulation and slower replacement of the labour force coupled with lower labour productivity, due to labor morbidity and mortality which leads to a mix of new and old skills

• Heavy impacts on sectors that are labour intensive, e.g. in agriculture and mining as those who die are those in the prime-age range

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5 In this study we limit our discussion to simplistic indicators.
• National food insecurity brought about by the lack of adequate availability and accessibility of food due to reduced output

• Reduced economic efficiency and low labor productivity

Loewenson and Whiteside (1997) identify three critical factors as being crucial in influencing the macroeconomic impacts as:

• The distribution and overall levels of wealth and poverty

• The extent of social cohesion (social norms, values, family controls and support)

• The mobility of a population, migration, displacement, sexual mixing within and between different social groups

However, because AIDS is still an emerging epidemic that has not run its full course anywhere in the world, the full impact has not yet been witnessed and documented and remains to some extent speculative (Jackson 2004:24).

4.11.2 Direct versus Indirect Costs of HIV/AIDS

It has been generally noted that the costs of the impact of HIV/AIDS on communities is both direct and indirect both on the micro and macro level. On the macro level direct costs are associated with HIV related illnesses, which have serious implications for health care budgets nationally and even around the region. Those segments of the population that are poverty-stricken stand to lose the most as pressures on the health budgets increases resulting in higher medical costs. In Zimbabwe direct macro-economic costs also include the increased pressure on pension funds and medical insurance, on operational budgets that inflate sectoral demands on the fiscus therefore requiring increased resources and on direct time loss (leading to a loss in the time value for money).

The specific fiscal implications of HIV and AIDS arise from increased outlays for care and prevention, increased personnel costs associated with higher morbidity and mortality, and reduced tax revenue as HIV and AIDS affects profits and the scale of economic activity. In Zimbabwe for the period under review it is difficult to isolate some of these impacts of the disease due to a general decline in economic activity as a worsening economic crisis gripping the country from late 1999 deepens. However, changes in real budgetary allocations for the health sector in general and those relating to HIV and AIDS in particular give an indication of the scale of this effect. In 2003 the national budget distribution by vote shows that Health
and child welfare was allocated about 12.7% of the total budget, but the budget distribution by operations showed that the share for health and child welfare was 18.7%. These figures actually show a decline in real terms of close to 4%, but this should not be read as simply indicating a decline in the allocations to the sector because this was accompanied by a huge increment in the Ministry of Finance and Economic Development’s appropriation. In 2004 the adjusted share for the Ministry fell to 9.3%. Since the decline is accompanied by an increase in expenditure in allocations for such areas as Agriculture and Defence, these changes are actually positive.

The major reasons for this are four-fold. Firstly, the increase in demand for health services necessitates a corresponding increase in public sector outlays in this sector. Secondly, on one hand there are increases in re-hiring and re-training costs associated with an increase in skilled manpower turnover owing to increased death of professionals such as teachers, extension officers, nurses and other public sector officials. Following this, it has been observed in Zimbabwe that the return to investment in human capital itself has started to fall in what might arguably be referred to as the medium to long term. This might well have been exacerbated by a situation where capital flight and emigration have become endemic. Nowhere is this more apparent than in the agricultural sector. Unofficial figures show that more than 43% of all agricultural extension workers have taken prolonged days off work due to illness or have died within the last 5 years. This skewed the distribution of the then Ministry of Lands, Agriculture Rural Resettlement as shown in the table below with a huge shift from actual services to Administration and general where most of the disease costs would be captured.

All this implies that even if the total number of people being trained declines, per person training costs will increase. On the other hand, the morbidity and illness that precede death imply a reduction in the on-the-job productivity of infected individuals and their family members. The latter because of the need to devote time to home care patients, and this imputed cost increases the total burden. Matshe (2004) estimates that upwards of 18% of total labour time allocation of rural households with members suffering from HIV and AIDS related illnesses may be diverted from productive endeavour during the period of illness.

Table 4.1 Shares of Total Ministry of Lands, Agriculture and Rural Resettlement

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*6 As the World Bank (2004) emphasises this depends upon the assumption that it is possible to replace every person leaving the labour force due to HIV and AIDS. While this may not be possible in the long-run, if prevalence rates remain high, it is an acceptable assumption over the short to medium term.

*7 New recruits necessitated by the on-going land reform program are not included in this figure.
<table>
<thead>
<tr>
<th></th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
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<tbody>
<tr>
<td>Administration and General</td>
<td>32.0</td>
<td>23.5</td>
<td>45.0</td>
</tr>
<tr>
<td>Research and Specialist Services</td>
<td>7.0</td>
<td>7.5</td>
<td>3.8</td>
</tr>
<tr>
<td>Agricultural Technical and Extension Services</td>
<td>20.4</td>
<td>18.7</td>
<td>14.0</td>
</tr>
<tr>
<td>Veterinary Services</td>
<td>13.8</td>
<td>18.0</td>
<td>7.6</td>
</tr>
<tr>
<td>Tsetse and Trypanosomiasis control</td>
<td>3.6</td>
<td>4.4</td>
<td>3.7</td>
</tr>
<tr>
<td>Surveyor General</td>
<td>2.1</td>
<td>2.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Lands and Technical Services</td>
<td>21.0</td>
<td>25.7</td>
<td>25.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
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</table>

*Source: GOZ, 2004*

For expenditure specifically targeting HIV and AIDS, no discernable increase in real terms is apparent. As the table below shows the most prominent change occurred in 2003. However, in real terms these expenditures show a marked decline.
Lastly, an increase turnover of public sector employees due to death implies an increased payout of pensions and other annuities to the surviving family members. Using data from the Salary Service Bureau it has been estimated that in the years 1995-2005 claims for pensions have steadily risen by an average of 3.5%\(^8\) per year.

IMF studies estimate that with the effects of the pandemic becoming ever more pronounced in the next 10 to 15 years the costs of prevention and clinical treatment will increase up to 0.3% and 1.1% of GDP respectively. Following earlier World Bank studies which estimated that, after accounting for the expensive treatment apparatus, training costs of personnel and related infrastructure, the annual per patient cost of ARV therapy could be as high as US$2000 plus US$400 for prevention and treatment of opportunistic infections and palliative care, Haacker (2002) estimated that even with limited coverage rates (30% for palliative care, 20% for clinical treatment, 10% for ARV); total HIV related health-care costs of government could increase to 3.5% of GDP by 2010 compared to 2.1% of GDP in 2000.

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\(^8\) This estimate does not discount for death dues to other causes.
Indirect costs are more difficult to measure as they refer to loss of value of production, the loss of current wages, the loss of the present value of future earnings, training cost of new staff, high staff turnover, cost of absenteeism, higher recruitment costs, the drainage of savings, amongst others. The extent of the effect of the disease depends on the vulnerability as well as the susceptibility of the affected community (FAO, 1996). The direct and indirect costs are not mutually exclusive, and it is with this in mind that the analysis of the effect of the disease on either the macro or micro scale becomes complex. Often it is also the case that indirect effects come out as coping strategies by households to mitigate the direct effects.

4.11.3 Agriculture and economic growth

Agriculture and economic growth are closely linked. A range of literature has identified what have come to be regarded as the “traditional” role of agriculture to economic growth by asserting that agricultural production has potential beneficial spill over effects for non-agricultural production.

According to Kuznets (1961) as quoted in Ghatak and Ingersent (1986), the agricultural sector in developing countries, through backward and forward linkages with the other non-agricultural sectors of the economy is seen as being capable of having four types of contribution to economic development operating through both production and consumption which include,

1) Providing food for domestic consumption

2) Providing a market for the industrial sector

3) Factor contribution- this entails the transfer of surplus capital and surplus labour from agriculture to the non-agriculture sector

4) Foreign exchange contribution- by augmenting a country’s export earnings and production of agricultural import substitutes

4.11.4 Impact of AIDS on the use of Capital in Agriculture

Agricultural transformation and development almost always involves increased intensification of the use of capital in the farm production process. The main types of capital-led intensification include the use of fertilizers, hybrid seeds, and chemicals as well as draft power. Farm households tend to see remittances as well as off-farm income as primary means to afford expensive assets such as oxen, ploughs, and fertilizers that are used to capitalize farm production. These sources of income are often jeopardized
among AIDS afflicted households, particularly those that are asset – poor and vulnerable (Yamano and Jayne, 2004).

Cash constraints on farming activities are compounded during illness and death, when medical and funeral expenses arise as the available capital can or has to be diverted from a productive venture to a non-productive one. Care giving by other members reduces their income potential as well. To the extent that afflicted households shed assets and are forced to reduce their usage of cash inputs in agriculture, the cumulative effect may be a narrowing of the strata of farmers able to produce a marketable surplus from farming (Jayne et al., 2004). In the Macroeconomic context the impact can be traced using a simple flow chart.

Fig 4.9 Impact of HIV & AIDS on the use of Capital in Agriculture

Notes: * indicates the areas most critically affected by a decline in capital utilisation disruptions

Source: Adapted from de Janvry and Sadoulet, 1995
From this presentation general equilibrium changes caused by reduced capital use or the erosion of the capital base can be traced throughout the macro-economy. The resultant distributional effects eventually disrupt the pattern of government spending and its ability to cater for the social needs of its people. Of importance then is the distribution of the pandemic by occupational groups. Since the skilled labour groups were the most affected in the initial phases (1982-1992) of the epidemic, the macroeconomic impact is pronounced. This is because the direct impact on the stock of human capital for such a small economy as Zimbabwe is larger, thus reducing the supply of skilled labour thereby lowering the (marginal productivity of all factors of production which imply a decrease in the rate of investment (see Matshe, 2003).

4.11.5 Impact on savings, assets and investment

In an economy where feedback effects are common between different levels of economic activity it is common that the first port of call of finance for afflicted households is their savings. Primary need (in this case the need for health care) would necessitate recourse to financial savings before other forms of savings. This has resulted in a 91.5% drop in saving in the country starving the productive sectors of investment resources that could otherwise bolster the economy. Household savings are a key source of institutional income and it provides security for the development of human capital. According to Cohen (2000), HIV/AIDS affects the volume and uses of savings. He argues that there exist many productive investment opportunities, but that the level of savings, and possibly shortages of essential labour, constrains the rate of development and growth. The impact would be to reduce total savings, have less investment, less productive employment and hence lower incomes.

For the government, the savings-consumption behaviour of economic agents proceeds from explicit policies. Economic agents, particularly firms are generally assumed to save all their residual income, but households have constant but socially differentiated savings rates and explicit demand systems derived from their utility maximization decisions.

HIV/AIDS has been termed an “asset stripper” as it has the potential of totally reversing economic gains and leaving households poor. Households can mitigate the short-run effects of adult mortality and other shocks by selling assets such as farm equipment and small and large livestock. Asset depletion is cited as a common response to adult morbidity and mortality in the household coping literature, and other

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9 There is a time lag to this effect.
10 The calculation of this figure does not take into consideration the impact of the financial crisis, and the general decline in the economic activity within the Zimbabwean economy.
studies have found large reductions in asset holdings due to adult mortality (Barnett and Blaikie, 1992). Asset depletion can increase households’ vulnerability to income shocks, and may decrease household use of cash inputs and animal traction in crop cultivation, which will tend to result in lower productivity and overall crop production (Mather et al, 2004). Liquidation of assets has been observed to follow the following sequential pattern (Sue Mbaya, 2002):

Savings

Business income

Household assets

Productive assets

Land

4.11.6 Impact on Labour

The demand for and supply of education are falling thereby decreasing Zimbabwe’s human capital. The population growth rate has decreased (to about 2.6%) and school enrolments have declined, the latter reflecting the fact that family networks are weakening owing to parental deaths, increasing the number of orphans having to drop out of schools to provide for themselves and their siblings (It has been estimated that by the end of 2005 there will be 1140000 orphans in the country). The increased mortality of teachers and administrators in the education system correspondingly affect supply. Computable general equilibrium simulations of projected changes show that in the long-term economic growth will be severely curtailed by this effect. Moreover, the net cost of training future skilled professionals increases, because lower life expectancy of adults implies a lower average return to investment in education, if this induces lower investment in human capital accumulation, this will adversely affect future production.

11 Indeed this is the basis (hypothesis) of the microeconomic section of this study
In a nutshell, the pathways of the macroeconomic impact of HIV/AIDS can therefore be summarized as follows:

a) *Increased costs of HIV/AIDS treatment* - manifested by increased government expenditure on health leading to an overall increase in the government expenditure without a matching increase in its revenues. This also has implications on expenditure switching from capital formation to recurrent health care expenses.

b) *Low savings and investment* – due to several leakages that are associated with HIV/AIDS as a result of HIV/AIDS induced savings withdrawals and reduced average propensity to save as the proportion of households’ incomes devoted to medical treatment increases.

c) *Reduced supply of labour* – as HIV/AIDS diminishes and incapacitates the existing pool of labour. This increases costs to firms and the economy as a whole due to deaths, absenteeism, increased turnover rates and training costs. HIV/AIDS also reduces ability to build human capital stock as it adversely affects the education sector, which is a pillar for human capital formation.

### 4.12 Conclusion

As evidenced by high prevalence rate in Zimbabwe, HIV and AIDS is a national problem, which deserves attention from both the government and non-governmental organisations. The government has however responded to this epidemic by adopting a National AIDS Policy and establishing a National AIDS Council through an Act of parliament. However, it still needs to improve on the expenditures devoted to the fight against this disease especially to treatment and care of HIV and AIDS victims. ARVs are still to be made widely available for HIV and AIDS patients.

NGOs have also responded to the need for fighting against HIV and AIDS. The HIV & AIDS sector is now arguably the most heavily covered sector in terms of NGOs’ participation. Rural and farming areas are also being covered by NGOs in the HIV and AIDS sector. However intervention strategies in these areas tend to focus on treatment and care of PLWHA and provision of material support to affected groups while neglecting the need to enhance the capacity of these people to help themselves and promote sustainable agriculture.

5.1 Introduction

In Zimbabwe, before attack by HIV & AIDS epidemic, smallholder peasant agricultural households were already complex and multi-dimensional economizing units. They were also profitably linked to the formal urban economy through wage employment and/or domestic commodity marketing. Wage employment was a major sink of surplus labor from the rural farming communities and a major source of cash income, savings and equity investments in rural agricultural development. The relationship between urban industries and rural household economy was largely positive.

Now with the emergence of HIV & AIDS era, the impact of the disease on agricultural production and food security prospects of rural households is necessarily complex and very difficult to ascertain. HIV & AIDS is alluded to affect rural households' capacity to produce, consume and to hold and accumulate asset stocks. So the often-stated negative impact of HIV & AIDS on agriculture is not obvious because it largely depends on household factor scarcity and impact of disease on scarce factors. Aggregate impact of HIV & AIDS on household livelihood is bound to differ from sum impacts on the household’s production, investment and consumption problems.

The paper examines the extent to which HIV & AIDS is affecting smallholder agriculture and food security in Zimbabwe and suggest policy intervention strategies that could be useful in improving the livelihoods of afflicted rural families. Major questions to be answered include:

- Are there any salient differences that exist between HIV & AIDS affected versus less affected smallholder farmer households in terms of socio-economic characteristics, production choices and livelihood outcomes?
- Is household HIV & AIDS status and intensity of affliction important in explaining observed disparities in households’ agricultural production and food security performance?
5.2 Research Approach

5.2.1 Survey Design

A baseline survey was carried in two provinces in Zimbabwe. A total number of 350 families were interviewed in Mashonaland East and Manicaland provinces, in the districts of Goromonzi and Makoni respectively. The sampling frame used in the survey was stratified to include both ‘affected and ‘less affected’ rural populations of the two communities. The study adopted the classification system of local Community Based Care-givers (CBC) of families deemed to be affected by HIV & AIDS and those not so affected by the virus. CBC classification defines a family as being “affected” based on judgments of severity of HIV & AIDS in the family and relative ability of family to cope in the presence of HIV & AIDS. Affected families were thus taken to be those that CBC had identified and were working with in their community programmes. These were identified from the records of CBC.

Local partners provided key logistical support in the field. These included Community Based Care-givers (from different programmes such as Home based Care, Village Health Workers, etc), local political and traditional leadership, Agricultural Research and Extension agents and Community Based Organizations (CBO) or Non Governmental Organizations (NGO) operating in the study areas such as Girl Child Network.

5.2.2 Analytical Tools

a) Comparative statistical analysis- this approach was used to compare practices and performances between HIV & AIDS affected and the lesser-affected population. The approach though has limitations in that if all rural families are affected significantly by HIV & AIDS (or by a third factor such as overwhelming cross cutting effects of poverty) little or no relative differences will show.

b) Econometric analysis- this analysis was done to find out if HIV & AIDS status and intensity of affliction is important to explain observed variation in important impact variables such as productivity, food security and food self sufficiency. The following are the two analytical tools used in this analysis.

♦ Multivariate Regression Analysis- Multivariate regression models are used to estimate the impact of one or more explanatory variables on a dependant variable. The dependant variable is assumed to be a linear function of more than one independent variable and an error term. The error term measures the
effect of other excluded variables and other sources of error. The model could be represented as follows:

\[ Y_j = \alpha_0 + \sum_{i=1}^{n} \alpha_i X_i + \mu_i \]

where 
\( Y_j = \) dependent variable
\( X_i = \) independent variable i
\( \mu_i = \) error term

- **Logistical Analysis**- uses the logit model to predict the likelihood that a given household with certain socio-economic characteristics and production choices falls within a certain group e.g. households can either be food secure or otherwise. The model can only be used when the dependent variable is binary i.e. can take on only two values, 1 and 0. The general model could be represented as follows;

\[ \log \frac{P_i}{1-P_i} = \alpha + \beta X_i \]

where 
\( P_i = \) the probability that a given household will fall within a certain group given \( X_i \),
\( X_i = \) independent variable i

### 5.3 Results and Discussions of Comparative Statistical Analysis

#### 5.3.1 Severity of Affliction and Community Based Targeting

The survey aimed at 50:50 ratio of “affected” and “less affected” families although results in Fig 5.1 show that this was not achieved due to some logistical reasons.
Fig 5.1. Distribution of affected and not so affected rural families in the survey sample

A scientific categorization of families based on their weighted index of sickness from HIV & AIDS related illnesses resulted in Fig 5.2. Fig 5.2 shows that Community Based Care-givers (CBC) classification and targeting system only reaches out to a subset of the severely and highly afflicted rural families.

Fig 5.2. Incidence of HIV & AIDS Related Illnesses in Rural Families

HIV & AIDS related illnesses are just as high in 10 to 20% of the rural families that caregivers do not normally target and very low in a third of the families that caregivers normally target.
5.3.2 Incidence of Mortality and Family Structure

Higher than normal mortality rates were observed among young parents resulting in the transformation of rural families into single to zero parent households (Fig 5.3). Over 50% of the rural families surveyed have lost one or both parents. Most of the parents died within ages of 26 to 38 years - leaving the burden of farming to feed, educating kids and parenting very young children with a single (often ailing) parent. This is evident in the family structures existing in these rural communities (Fig 5.4). The parent mortality ratio is slightly less for affected families targeted by CBC indicating presence of HIV & AIDS illness in that family.

Fig 5.3. Incidence of Mortality among HIV & AIDS most affected and less affected families

Fig 5.4. Differences in family structures of the sampled rural families
Widowed female-headed (single parent) families appear as the dominant family type in the survey sample followed by the traditional two-parent household (both present in the village). Families with one spouse in full-time industrial wage employment accounts for just 7%. One in every 33 families surveyed (3%) is a child headed and remains a special social concern in the rural communities.

### 5.3.3 Impact of HIV & AIDS on Agricultural Production Choices

HIV & AIDS affects production choices such as cropped area, number and type of crops grown, acres allocated to each crop and inputs applied to each enterprise. There is a tendency of HIV & AIDS affected households to grow lesser labour intensive food crops compared to cash crops. Crop diversification should be reduced in the presence of HIV & AIDS because of the household’s incapacity to cultivate greater pieces of land, labour morbidity and monocultural tendencies of such type of households. Diversion of household financial resources from productive activities to more consumptive expenditures such as health care should reduce input application rates for affected households.

**a) HIV & AIDS and Cropping System**

![Figure 5.5: Acreage put under cultivation in 2003-2004 season](image)

Greater proportion of the HIV-affected populations cropped more than 50% of their cropland coming out of the 2003. This basically shows that these families greatly rely on farming as a means of survival. The implication is that the effects of HIV & AIDS will be greatest on the affected compared to less affected families.
HIV & AIDS has pronounced and significant impacts on household farming system especially maize acreage when it has already resulted in adult mortality. Fig 5.6 shows that the presence of HIV & AIDS-related deaths in families, regardless of their status i.e. whether they are affected or not, greatly reduces acreage that is allocated to the maize crop. This change in cropping system has significant negative impacts on the food self-sufficiency and hence food security of families that would have suffered adult mortality.

![Fig 5.6 Differences in cropping systems](image)

**Fig 5.6 Differences in cropping systems**

Though the presence of HIV related deaths affect acreage allocated to food crops i.e. maize and legumes, it does not seem to affect acreage allocated to cash crops such as paprika and cotton. Generally households in the study areas basically farm for subsistence requirements and little land is devoted to cash cropping.

![Fig 5.7 Gender and Household Cropping System](image)

**Fig 5.7 Gender and Household Cropping System**

67
Female-headed households, regardless of their HIV & AIDS status, put significantly less maize acreage under production compared to male-headed households. This could be attributed to the fact that women generally perform other core activities that other than farming i.e. reproductive duties and in cases of illness spend more time nursing the sick. This reduction in farming labour together with loss of important agricultural assets could result in reduction in land put under crop production.

b) HIV & AIDS and Crop Diversification

Crop diversification implies that a household is likely to be food secure and hence has the option to venture into other crop enterprises that might not necessarily contribute directly to family food requirements. Fig 5.8, shows that HIV & AIDS is not a significant factor in explaining crop diversification of rural families.

![HIV/AIDS & Crop Diversification](image)

**Fig 5.8 Differences in cropping systems**

There is discernible but not significant differences in crop diversification among affected and less affected farmers that have suffered or not suffered adult mortality. Generally there is less crop diversification in the study area although Fig 5.9 shows that male-headed households are more crop diversified than female-headed households. A greater percentage of male-headed households grow at least 3 crops compared to their female counterparts.
c) Impact of HIV & AIDS on Fertilizer Application rates

Fig 5.10, shows that fertilizer use is almost the same across HIV & AIDS affected and less affected households when both have already suffered adult mortality (ranging from 135-140kgs/ha).

Fig 5.9 Gender and Crop Diversification

Fig 5.10 Adult mortality and application rate of Nitrogen fertilizers
But for households that have not suffered adult mortality, more HIV & AIDS afflicted families seem to use more nitrogenous fertilizer on average per area i.e. 132kg/ha compared to 123kg/ha for less afflicted households, in an apparent bid to intensify production. This shows that fertility rather than land area is the binding constraint to farm production in smallholder farming.

5.3.4 Impact on Agricultural Production Performances and Food Security Realizations

Extended interruption of the labour supply in HIV & AIDS affected households may also mean such important activities as land preparation or maintenance of irrigation systems suffer, affecting future production and yield realizations in turn. Loss of agricultural assets in HIV & AIDS affected households constraints production and the attainment of food security. It is important to determine the extent to which HIV & AIDS affects these important household livelihood indicators.

a) Impact of HIV & AIDS on Yields Realization

Average yields of maize are marginally higher for HIV & AIDS affected farmers (583kgs/ha) than for less affected farmers (570kgs/ha). But these maize yields are lower if compared to national communal/smallholder average yield of around 600kg/ha. This shows that all households in the survey are poor performers as far as maize production is concerned. Healthier rural families appear to enjoy superior yields on such cash crops as paprika (Fig 5.11).

![Fig 5.11 Maize and paprika yields for 2003-2004 production season](image)
Given that price for tradable maize is much lower than for cash crops relative to the border parity prices, lower maize prices in the 2003-2004 season, affected livelihoods of the afflicted families more than the healthier rural families. In essence government pricing policies is heavily taxing afflicted families more compared to healthier families thereby exacerbating poverty in these communities.

HIV & AIDS has greater implications on the maize yield realization of female-headed households. Fig 5.12 shows that a less percentage of HIV & AIDS affected female-headed households is realizing above sample average maize yields compared to male headed households and less affected female headed households.

b) Impact of HIV & AIDS on Food Self sufficiency and Food Security

HIV & AIDS afflicted families that suffered adult mortality have pronounced and significant lower food self-sufficiency levels. But among households that have suffered deaths, affected households tend to be more self-sufficient. This is shown in Fig 5.13a.
The results clearly show that HIV & AIDS related deaths reduce families’ food self-sufficiency. This could be associated with the loss of production capacity that is associated with deaths of adults in rural communities. Agricultural production capacity could be reduced when important farm assets such ox-drawn plough, scotch cart, cattle, land, etc are lost through inheritance. Agricultural production knowledge is also lost when an adult of a family dies, leaving in most cases relatively inexperienced individuals to manage the farm.

Apart from a household’s capacity to produce its own food, food security is associated with a household’s ability to bring in income from other sources such as formal employment, informal employment, remittances, etc. Fig 5.13b shows that generally more than 50% of households in all categories of affliction are food secure though the less affected families are significantly more food secure compared to the affected households.

Fig 5.13a HIV & AIDS and Food Self Sufficient
Generally smallholder female-headed households are less food secure compared to male-headed households. Some ambiguities are observed with regards to food self sufficiency of rural households. A greater proportion of HIV & AIDS affected female-headed households are more self-sufficient compared to male-headed households although for less affected households this is different. A greater percentage of less affected male-headed households are more self-sufficient compared to female-headed households.
5.3.5 Impact on Incomes, Consumption and Investment Activities

HIV & AIDS is expected to have a negative impact on household's capacity to earn income. It is also expected to induce some changes in a household's expenditure patterns. Smallholder agriculture is labour intensive due to low levels of mechanization. HIV & AIDS has the potential to erode the active labour force in a farming system thus reducing hours at work in both on farm and off farm employment. This reduces a household's opportunity to earn income.

An HIV & AIDS affected household is also expected to change its expenditure patterns, with most of its income paying for medicines, hospital charges, and palatable food for the sick and funeral expenses. This reduces income invested in other important areas such as education and agriculture thus compromising present and future food security of the household.

Results from the survey in Fig 5.15 shows that for both affected and less affected families, farming provide a greater proportion of rural income. HIV & AIDS does not seem to have any effect on income earned from farming by affected and less affected families though there is a significant difference in the average income earned from local jobs by the same families respectively. Less affected families earn more from local jobs compared to affected families. This could be attributed to the fact that most households targeted by the CBC are those that have sick persons infected by the HIV virus. Thus household members have to devote some of their labour time to nursing the sick.

![Fig 5.15 Major sources of rural income](image-url)
HIV & AIDS has pronounced a significant impact on female headed households’ capacity to earn income. HIV & AIDS affected female-headed households earn significantly less income from farming compared to their male counterparts. For less affected households the female-headed households perform better than their male counterparts in generating income from farming.

Fig 5.16 Gender and Household Income Sources

There seems to be a trade off that exists between consumption and investment activities of rural families. Fig 5.17 shows that less income is invested compared to that which is consumed. Both categories of households expend more on food compared to other income demanding activities but healthier rural families spend more on food. HIV & AIDS affected households invest more in farming and education.
Fig 5.17 Household consumption and investment activities

Fig 5.18 HIV & AIDS and Engel's ratio

Fig 5.18 confirms the above results. Engel's ratios show endemic poverty in both healthier and HIV & AIDS affected households with more than 50% being spent on food. Fig 5.19 also confirms these results. Both female and male headed spend a lot on food. But HIV & AIDS seem to have a significant impact on the income invested in agriculture/farming by female headed households. HIV & AIDS affected female-headed households invest very little proportion of their income into farming compared to male-headed households. This has huge negative implications on female-headed households’ agricultural production and hence food security status in the presence of HIV & AIDS sickness or deaths.
5.3.6 Perceived effects of HIV & AIDS on Household Economy

The presence of HIV & AIDS within rural families is perceived by more than 60% of interviewed families to severely affect farming decisions though the effect is more on afflicted families (74% affected). Rural families indicated that HIV & AIDS would affect farming in a number of ways. The presence of HIV & AIDS in a family reduces time devoted to farming, diverts funds initially intended for agricultural activities and results in the selling of essential livestock such as cattle and farming implements such as the ox-drawn plough.

As shown in Fig 5.20, some farmers indicated that HIV & AIDS also has very high informal effects. There is a significant difference in the percentage of affected and less affected rural families that perceived very high informal effects. More affected families (42%) perceived very high informal effects compared to less
affected families (35%). This confirms the presumed effects of time taken nursing the sick on the conduction of informal activities such as employment in local jobs (maricho).

5.4 Conclusion

The targeting system of the CBC seems to be missing a significant population of the rural communities that is afflicted and severely affected by HIV & AIDS. Though this might seem as a weakness in the CBC targeting system, it also clearly points out that there might be other factors other than HIV & AIDS effects that are considered by the community when targeting. This idea needs further exploration.

HIV & AIDS pandemic has left a trail of single parent and/or child headed households in most rural communities. This pandemic is thus transforming the rural farm based families and robbing them of the means to acquire capacity to maximize farm production. The higher than normal incidence of chronic illnesses during productive phase and pre-term mortality of productive family members has reduced family capacity to acquire productive assets.

HIV & AIDS has to some extent resulted in demographic structural changes such as early marriages by youths that have resulted in more dependents compared to savings and farm assets. Trend towards early child bearing by youth dying young is leaving families/society with a burden of raising more children from a diminished force of healthy workers.

HIV & AIDS seem to affect farming and livelihood behavior of rural families. It seems to have its greatest impact on female-headed households of the communities. Generally rural families have been shown to be living in absolute poverty whether or not they are HIV & AIDS afflicted. Most of these families earn very low incomes per annum and do not own important farm productive assets. Except for some few exceptional cases, most rural families use marginally low levels of inputs and thus perform badly as far as yield realization is concerned. HIV & AIDS impact on key variables such as productivity, food security and self sufficiency appear to be somewhat contradictory and at best ambiguous - especially given the confounding impacts of adult mortality and macro policy environment. This situation makes it difficult to ascertain some of the differences in the above statistics to HIV & AIDS alone. Unless these ambiguities are clarified - there would be academic and practical questions about relative implications of HIV & AIDS on smallholder farmers. Hence it calls for further analysis to find out if HIV & AIDS
related variables are playing an important role in significantly explaining differences in important impact variables such as productivity, food self sufficiency and food security.

5.5 Results and Discussions of Econometric Analysis

5.5.1 Motivation and Hypothesis

Important agricultural performance variables include productivity, food self-sufficiency and food security. These impact variables are characterized by greater variability across agricultural households in the same rural communities. They are also affected by a multitude of factors, which together with family health situation affect them. Important questions to be answered in this analysis include the following;

- Does the HIV & AIDS status of the household emerge as one of the significant structural and behavioral variables explaining the observed variability in performance of households?
- Is the HIV & AIDS status of the household key in explaining the likelihood of a given rural household being food secure?

5.5.2 Approach and expected impacts of selected variables

Multivariate regression and logistic models were created for the three impact variables as explained in section 2.2. Explanatory factors considered in the analysis of each impact variable and their predicted relationship are given in Table 1 below.

Table 5.1 Explanatory variables considered in each model
<table>
<thead>
<tr>
<th>Variable</th>
<th>Expected Sign</th>
<th>Relationship with Dependent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Productivity</td>
<td>Food security</td>
</tr>
<tr>
<td>Region</td>
<td>-+</td>
<td>-+</td>
</tr>
<tr>
<td>Level of Education</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Cultivated land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family labour/ size of family</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Total nitrogen or nitrogen per ha of maize</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Number of cattle</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Gender of household head</td>
<td>-+</td>
<td>-+</td>
</tr>
<tr>
<td>Asset/wealth index</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Weighted index of the sick (WIS)*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Number of orphans*</td>
<td>-+</td>
<td>-+</td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Maize yield/ ha</td>
<td></td>
<td>+</td>
</tr>
<tr>
<td>Maize seed/ ha</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Status of household*</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Social club</td>
<td>-+</td>
<td></td>
</tr>
<tr>
<td>Type of land</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

NB * HIV & AIDS related variables
5.5.3 Results: Multivariate Regression Analysis

a) Productivity

Fig 5.21 Variability in yield/ha across households

Productivity is given as returns to land put under crop production. There is greater variability in maize yields across household (Fig 5.21). Farmers within the same geographic space realize pronounced differences in maize yield due to farmer level factors such as level of management, input use, gender, degree of impact of HIV & AIDS related issues, etc.

Results in Table 2 below, show that from the two models considered in determining factors that affect productivity, the linear function has a better level of significance and a higher explanatory power and thus will be used in this discussion. Though HIV & AIDS related variables i.e. the weighted index of sickness (WIS) and the status of the household, are negatively affecting productivity, results indicate that they are not significant factors in explaining observed variation in maize productivity across households.

A number of factors emerge as significant in explaining differences in productivity across households. These include the education of the household head, maize seed and nitrogen application rate, number of crops and the type of social club that a household belongs to.

Household head’s level of education affects management practices put on the farm. Productivity increases the more educated the household head is. Input application rates such as seed planted and nitrogen applied per hectare, affects efficiency in production. Higher input application rates are expected to increase maize productivity.
### Table 5.2 Factors Affecting Variability in Productivity

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Linear (ols)</th>
<th>Semi-log</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parameter estimates</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>39.5 (0.22)</td>
<td>4.7 (7.45***)</td>
</tr>
<tr>
<td>Region</td>
<td>0.06 (1.03)</td>
<td>-0.11 (-0.82)</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.04 (-0.74)</td>
<td>-0.01 (-0.1)</td>
</tr>
<tr>
<td>Level of education</td>
<td>0.088 (1.7*)</td>
<td>0.04 (0.41)</td>
</tr>
<tr>
<td>Number of cattle owned</td>
<td>0.02 (0.37)</td>
<td>0.06 (0.59)</td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>-0.07 (-1.24)</td>
<td>-0.03 (-0.27)</td>
</tr>
<tr>
<td>Maize seed/ha</td>
<td>0.21 (3.7***)</td>
<td>0.24 (2.26**)</td>
</tr>
<tr>
<td>N/ha of maize</td>
<td>0.24 (4.3***)</td>
<td>0.22 (2.16**)</td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>-0.21 (-3.9***)</td>
<td>0.25 (2.36**)</td>
</tr>
<tr>
<td>Status of household</td>
<td>0 (-0.008)</td>
<td>-0.013 (-0.12)</td>
</tr>
<tr>
<td>Family labor</td>
<td>0.05 (0.89)</td>
<td>0.16 (1.5)</td>
</tr>
<tr>
<td>Social club</td>
<td>0.16 (2.99**)</td>
<td>0.17 (1.61)</td>
</tr>
<tr>
<td>Type of land</td>
<td>0.01 (0.2)</td>
<td>0.19 (1.53)</td>
</tr>
<tr>
<td>R</td>
<td>0.50</td>
<td>0.55</td>
</tr>
<tr>
<td>R Square</td>
<td>0.25</td>
<td>0.30</td>
</tr>
<tr>
<td>Adjusted R Squared</td>
<td>0.22</td>
<td>0.20</td>
</tr>
<tr>
<td>Durbin Watson</td>
<td>1.86</td>
<td>2.4</td>
</tr>
</tbody>
</table>

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

*NB In brackets are t values

Crop diversification negatively affects maize productivity. The more crop diversified a household is, the more the demand on scarce resources. This affects efficiency in production of all crops including maize. Households that belong to agricultural related social clubs such as community projects, marketing clubs, etc, are expected to have higher maize productivity. This is because such households could easily have access to inputs and new technology on the market. They could also gain from the knowledge acquired through interaction with other farmers or professionals who visit the communities.
b) Food Security

Rural farming communities are characterized by large variations in food security status in any given year (Fig 5.22). Food security was measured in terms of intake of cereals as a ratio of total cereal requirements. The Translog function in Table 5.3 has a better explanatory power compared to the other functions and thus will be considered for this analysis.

HIV & AIDS is a significant factor in explaining variations in food security across households. WIS emerged, as one of the significant explanatory variables in the model. Increase in the WIS resembles worsening impact of HIV related sickness on the availability of family labour and thus productivity. It also resembles worsening impact of HIV related sickness on the scarce financial resources available to the household. With increased sickness in the home demand for health care increases thus diverting funds that could have been otherwise used to buy more food and/or acquire inputs to use in production. This culminates into reduced food security.

![Variability in food security across households](image)

**Fig 5.22 Variability in food security across households**

The presence of orphans in a household does not seem to significantly affect a household’s food security status. Though marginal, the positive impact on food security associated with increased number of orphans could be related to the increased food handouts being given to households with orphans by different Non Governmental Organizations in the study areas.

**Table 5.3 Factors Affecting Variability in Food Security**
Other variables that are significantly explaining variations in food security across households include asset/wealth index, cultivated land, maize yield/ha, gender of household head and total number of cattle. Male headed households tend to be more food secure compared to female headed households. This is because most male heads are useful in earning income from formal and informal employment that will be used to supplement family food reserves if the need arises. Male heads tend to be more mobile than female heads, who have to stay at home taking of the children. This increases chances of male heads being able to secure employment elsewhere away from home where there are increased opportunities of earning higher wages.

c) Food Self Sufficiency
Food self-sufficiency is given as consumption of own staple food crops as a ratio of total maize consumed. There are large observed variations in self-sufficiency across households (Fig 5.23). These variation come from pronounced differences in social and economic factors affecting each household. Some households have surpassed food self-sufficiency in maize production while others are not yet there.

The function to be explained in this discussion is the semi-log function, which has a higher explanatory power, compared to the other functions (Table 5.4). HIV & AIDS does not seem to have a significant influence on household food self-sufficiency. All the HIV related variables included in the model i.e. WIS and household CBC status are not significant in explaining variation in food self-sufficiency their marginal impacts on the dependent variable are negative. Variables significant at explaining variation in self-sufficiency across households include size of family, number of cattle, asset index, cultivated land and maize seed planted per ha.

**Table 5.4 Factors affecting variability in food self-sufficiency**
### Parameter estimates

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Linear (OLS)</th>
<th>Semi-log</th>
<th>Translog</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.34 (4.4***)</td>
<td>0.36 (0.64)</td>
<td>0.86 (0.42)</td>
</tr>
<tr>
<td>Region</td>
<td>0.04 (0.75)</td>
<td>-0.01(-0.11)</td>
<td>0.02 (0.12)</td>
</tr>
<tr>
<td>Size of the family</td>
<td>0.27 (5.0***)</td>
<td>0.31(4.43***)</td>
<td>0.33 (2.2**)</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.01 (-0.16)</td>
<td>-0.07 (-0.88)</td>
<td>-0.1 (-0.66)</td>
</tr>
<tr>
<td>level of education</td>
<td>0.01 (0.24)</td>
<td>0.05 (0.66)</td>
<td>-0.1(-0.85)</td>
</tr>
<tr>
<td>number of cattle</td>
<td>0.35 (2.52**)</td>
<td>0.52 (3.59***)</td>
<td>0.19 (0.84)</td>
</tr>
<tr>
<td>Asset/wealth index</td>
<td>0.42 (-2.95***)</td>
<td>0.6 (4.1***)</td>
<td>0.09 (0.36)</td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>-0.02 (-0.34)</td>
<td>-0.06 (-0.89)</td>
<td>-0.16 (-1.14)</td>
</tr>
<tr>
<td>Land cultivated</td>
<td>-0.23 (-4.13***)</td>
<td>-0.41(-5.43***)</td>
<td>-0.59 (-3.16***)</td>
</tr>
<tr>
<td>Maize seed/ha</td>
<td>0.05 (0.86)</td>
<td>0.16 (2.01**)</td>
<td>0.01(0.03)</td>
</tr>
<tr>
<td>N/ ha of maize</td>
<td>0.13 (2.25**)</td>
<td>0.01(0.15)</td>
<td>0.27 (1.65)</td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>-0.11 (-1.9*)</td>
<td>-0.05 (-0.61)</td>
<td>-0.07 (-0.39)</td>
</tr>
<tr>
<td>Status of household</td>
<td>-0.06 (-1.1)</td>
<td>-0.03(-0.46)</td>
<td>0.08(0.5)</td>
</tr>
<tr>
<td>R</td>
<td>0.49</td>
<td>0.59</td>
<td>0.67</td>
</tr>
<tr>
<td>R Square</td>
<td>0.24</td>
<td>0.35</td>
<td>0.46</td>
</tr>
<tr>
<td>Adjusted R Squared</td>
<td>0.21</td>
<td>0.30</td>
<td>0.29</td>
</tr>
<tr>
<td>Durbin Watson</td>
<td>1.89</td>
<td>2.02</td>
<td>2.21</td>
</tr>
</tbody>
</table>

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

*NB In brackets are t values

Self-sufficiency of a household improves with larger families, as more labour will be available. Increased number of cattle increases manure availability and draft power required to cultivate the land. Higher seed rate increases maize yield and hence food self-sufficiency. These results are shown in Table 5.4 above.

### 5.5.4 Results: Logistics Analysis

The logistic results in Table 5.5 confirm most of the above results. Directly HIV & AIDS related variables such as weighted index of sickness, number of orphans and household affliction status do not seem to significantly affect the likelihood of a household being highly productive, food secure or self-
sufficient. Variables that were predicted to significantly affect the chances of a household being highly productive include nitrogen per hectare of maize planted, number of crops grown by a given household, number of cattle, maize seed rate and social club that a household belongs to. While the other factors mentioned above are likely to increase the chances of a household being highly maize productive, the increase in the number of crops grown reduces this chance.

Results also show that only three factors are significant in explaining the likelihood of a household being food secure. These are maize yield per hectare, total land cultivated and total nitrogen use by a given household. The more productive a rural household is, the more fertilizer it uses and the more land it cultivates greatly increases the chances of the household being food secure. On the other hand factors that deal directly with agriculture production are significant in explaining the likelihood of a household being self-sufficient. These include family labour, asset base, land cultivated, crops grown, number of cattle and seed application rate.

Area cultivated and asset vs. labor, number of crops

**Table 5.5 Likelihood relationships between HIV & AIDS and key dependent variables: Logistic results**

<table>
<thead>
<tr>
<th>Dependent Variables</th>
<th>Food security</th>
<th>Food self sufficiency</th>
<th>Maize productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Independent variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>-4.1 ***</td>
<td>1.1</td>
<td>-4.2***</td>
</tr>
<tr>
<td>Region variable</td>
<td>-0.55 (0.58)</td>
<td>0.15 (1.16)</td>
<td>-0.33 (0.71)</td>
</tr>
<tr>
<td>Asset/wealth index</td>
<td>0.04 (1.01)</td>
<td>-0.04 (0.96****)</td>
<td>-</td>
</tr>
<tr>
<td>Total N or Nitrogen/ha</td>
<td>-0.004 (0.99**)</td>
<td>0.001 (0.99)</td>
<td>0.005 (1.0****)</td>
</tr>
<tr>
<td>Cultivated land</td>
<td>0.54 (1.7****)</td>
<td>-0.54 (0.58****)</td>
<td>-</td>
</tr>
<tr>
<td>Maize yield/ha</td>
<td>0.01 (1.0****)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Education</td>
<td>0.69 (2.0)</td>
<td>-0.73 (0.48)</td>
<td>0.67 (1.96)</td>
</tr>
<tr>
<td><strong>Weighted index of the sick</strong></td>
<td><strong>-0.048 (0.95)</strong></td>
<td><strong>-0.003 (1.0)</strong></td>
<td><strong>-0.02 (1.01)</strong></td>
</tr>
<tr>
<td>Number of orphans</td>
<td>-0.02 (0.96)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Family labour</td>
<td>0.9 (2.6)</td>
<td>0.26 (1.3****)</td>
<td>0.27 (1.31)</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.4 (0.67)</td>
<td>0.34 (1.4)</td>
<td>-0.21 (0.81)</td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>0.12 (1.12)</td>
<td>-0.41 (0.66**)</td>
<td>-0.39 (1.46**)</td>
</tr>
<tr>
<td>Number of cattle</td>
<td>-0.06 (0.65)</td>
<td>0.54 (1.2*)</td>
<td>0.35 (0.7**)</td>
</tr>
<tr>
<td>Maize seed/ha</td>
<td>-</td>
<td>0.02 (0.98*)</td>
<td>0.04 (1.04****)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Status of household</strong></td>
<td>-</td>
<td>-</td>
<td>0.28 (0.85)</td>
</tr>
<tr>
<td><strong>Social club</strong></td>
<td>-</td>
<td>-</td>
<td>0.21 (1.24*)</td>
</tr>
<tr>
<td><strong>Type of land</strong></td>
<td></td>
<td></td>
<td>0.16 (1.16)</td>
</tr>
<tr>
<td><strong>Predicted Values</strong></td>
<td>0.79</td>
<td>0.77</td>
<td>0.74</td>
</tr>
<tr>
<td><strong>-2 log Likelihood</strong></td>
<td>262.5</td>
<td>307</td>
<td>328</td>
</tr>
</tbody>
</table>

(* exponential beta values

5.5.5 Insights from the econometric results

There are contradictory results that come out this analysis. Though HIV & AIDS is one of the important factors in explaining variations in food security it is not important when it comes to increasing the likelihood of a household being food secure or when explaining variations in productivity and food self-sufficiency. Other social and economic factors such as input application rates, level of education, asset base, gender of household, etc, appear important in influencing farm decisions. This has important implications for policy in that it points out factors that could be considered as intervention entry points for sustainable development. The presence of other factors also influencing key impact variables raises a lot of questions as to what extent should some of the observed changes in smallholder agriculture be attributed to HIV & AIDS. Hence the need to conduct research that would come up with proper methods of siphoning out the impacts on agriculture attributed to this dangerous disease.
6. Impact of HIV & AIDS on Livelihoods of Women in Smallholder Agriculture

6.1 Introduction

Gender differences exacerbate the social, economic and cultural inequalities that define women's status in society. Gender differences and inequalities affect the extent to which men and women, boys and girls are able to enjoy basic security needs such as survival, safety, opportunity, dignity, agency and autonomy. Those most deprived of these needs are themselves most highly vulnerable to HIV infection and most disadvantaged in coping with its impact (Elhadj Sy, 2001). The HIV & AIDS epidemic is affecting women and girls in increasing numbers. According to recent population-based household surveys, adult women in sub-Saharan Africa are up to 1.35 times more likely to be infected with HIV than their male counterparts (UNAIDS, 2004). Women are thus affected both as careers and caregivers. With the high prevalence of HIV & AIDS, women naturally have to carry the burden of care giving such that with the care giving roles that they are taking, less time is allocated to agriculture related activities hence the smallholder farming sector suffers.

Women have a key role in ensuring economic security for their families and they are at the helm of smallholder agriculture. Unequal gender relations and unequal access to economic resources have made women poorer than men and this has made them more vulnerable to HIV & AIDS. The low marginal economic status of women, socio cultural practices, low income, poverty and high rates of unemployment are some of the factors that contribute to high risk sexual behaviour and hence vulnerability to infection. In many parts of Africa, women lose all or most of the household assets after the death of a husband because of African tradition and culture that bequeath the ownership of assets to men. Thus upon the death of their spouse, women often lose their houses, land, livestock, plough and other important resources. In Zambia, for example, IFAD found: "Not only did the death of a spouse reduce household productivity and livelihood options, but also the impact was exacerbated when associated with property grabbing by the deceased's relatives (IFAD, 2000). Thus it’s always likely that there is a gender related difference in assets base between male and female-headed households in most rural communities.

This chapter explores the gender dimension of impact of HIV and AIDS on Agriculture. It directly explores whether gender status of household head is important in accounting for observed differences in agricultural performance and asset wealth holding over and above the considerations of HIV & AIDS impacts. The chapter begins with gender analysis of HIV and AIDS situation in Zimbabwe followed by a
gender characterization of impact of HIV & AIDS on livelihoods of women in smallholder agriculture. The qualitative descriptions are followed by presentation of quantitative evidence of how gender influences the HIV & AIDS impact on smallholder agriculture production and food security.

### 6.2 Gender dimensions of the HIV & AIDS situation in Zimbabwe

HIV & AIDS epidemic is disproportionately affecting women. All indications on the distribution of HIV & AIDS in Zimbabwe by age and sex across time indicate that women are getting infected at a fast rate. Women are spending their time providing for the sick as care-givers in their families and in their communities. Yet very little of the public resources from government are being channeled to assist women in rural communities in their work of helping rural agricultural families with HIV and AIDS live with dignity.

![Trends in prevalence of HIV](image)

**Fig 6.1. Trends in HIV & AIDS infection, 1983-2003**

HIV prevalence rates has been steadily increasing over the past years among the 15-49 year age group based on estimates that were prepared by the MOHCW working group. Overall prevalence rate is still high but has started to decrease. Prevalence rose in the late 1980s and the early 1990s and might have

---

peaked between 1998 and 1999. Since then the prevalence seems to have leveled off but this does not mean that the epidemic has been brought under control. The number of women infected with HIV & AIDS has consistently been higher than that of men.

HIV infection rates among women in the 15-19 year age group are much higher than they are for men in the same age group. In the 20-24 age group infection rates for the women are about three times higher than those for the males. For women the prevalence rates are higher between the ages of 25 and 35 but for the men the prevalence rates are higher in the ages from 30 to 39.

Fig 6.2: Distribution by age and sex of infected persons 15-49, 2003

In the older age groups more men are infected such that the proportion of men who are infected is higher than that for women in the older age groups. The analysis therefore shows that women are infected when they are still young whereas men are usually infected when they are older. Sexual relations between young women and older man can be attributed to be the cause of these results (MOHCW, 2003).

At the end of 2003 a total of 870,000 women were infected by HIV whilst 670,000 males aged from 15 to 49 were infected by the virus out of a total of 154,000 adults. The prevalence rate for the 15-49-year age group was estimated to be between 20 and 28% and weighted rate of 24.6%. As can be seen more
women are infected by HIV & AIDS as compared to men. 56.5% of the females were infected by HIV & AIDS whilst an estimated 43.5% of those in the 15-49 year age group were infected by HIV & AIDS. This is a percentage according to the total number of adults who were infected with the virus. Considering that women are the ones that are mostly involved in activities that take place in smallholder agriculture, the results show that the smallholder agriculture sector is suffering because of HIV & AIDS as women are affected more.

There is reduction in labour and hence a reduction in yields thus seriously jeopardizing the food security situation in Zimbabwe. These results thus show that HIV & AIDS infected more women and that these women are in their most productive ages (the 15-49 year age group).

![Graph showing estimated number infected at the end of 2003](image)

**Fig 6.3: Estimated number infected at the end of 2003**

Generally the number of women visiting ANC's who are infected by HIV is high and the percentage has increased for some of the provinces from 2000 to 2002. Most of the women who visit ANC’s are basically the young women such that from the results it is disturbing to note that most of these women are infected by HIV. Matabeleland South had the highest percent of infected women. The trend in most of the provinces however is that of decreasing prevalence from 2000 to 2002 although some of the provinces like Matabeleland South, Mashonaland Central and Masvingo show a trend in which the trend shows an increasing prevalence rate. Overally the prevalence is high for all the provinces.

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13 MOHCW (2003)
Fig 6.4: Percentage of women visiting Antenatal Clinics who are infected (2000-2002)  

Prevalence varied with age group. The prevalence in the younger groups (15-19 and 20-24) has a similar pattern as it decreases with time from 2000 to 2002. Among the older women (35 and more), the prevalence is increasing. Overall, the ages from 25 to 34 have the highest prevalence compared to the other age groups. This can be attributed to the fact that these are the most sexually active age groups.

Fig 6.5: Prevalence of HIV among women attending ANC's by age group

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14 MOHCW, NAC (2004)
15 MOHCW, NAC (2004)
16 NAC, 2004
Table 6.1. Ranking the prevalence by age group

<table>
<thead>
<tr>
<th>Position</th>
<th>2000 Age groups</th>
<th>2001 Age groups</th>
<th>2002 Age groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>30-34</td>
<td>30-34</td>
<td>20-29</td>
</tr>
<tr>
<td>2nd</td>
<td>25-29</td>
<td>25-29</td>
<td>30-34</td>
</tr>
<tr>
<td>3rd</td>
<td>20-24</td>
<td>35-39</td>
<td>35-39</td>
</tr>
<tr>
<td>4th</td>
<td>35-39</td>
<td>20-24</td>
<td>20-24</td>
</tr>
<tr>
<td>5th</td>
<td>15-19</td>
<td>40-44</td>
<td>40-44</td>
</tr>
<tr>
<td>6th</td>
<td>40-44</td>
<td>15-19</td>
<td>15-19</td>
</tr>
<tr>
<td>7th</td>
<td>-</td>
<td>-</td>
<td>45-49</td>
</tr>
</tbody>
</table>

Prevalence rates are highest for women aged 30-34 and 25-29. This age group of women is the most productive and most reproductive in terms of childbearing. Prevalence is thus highest among those aged between the ages of 25 and 34 - the most sexually active. The 15-19 and the 40-44 year age groups take the lower positions. For the 15-19 year age group it maybe because they are not sexually active whilst the older women are more aware of HIV & AIDS and thus know the methods of preventing catching the virus for example consistent and correct use of condoms.

6.3 Women as caregivers in Rural Communities

Women are naturally taking up reproductive, productive and community care-giving roles in society. The advent of community based care for HIV and AIDS patients has landed rural women with the extra task of providing care at family level and at the community level effectively increasing the burden on women. Between attending funerals, caring for their own sick and making rounds in the community visiting and consoling the dying with very little material support, women care giving undoubtedly affects the time left for women to engage in their own agriculture and economic activities. Yet survey data does not indicate trade-off as women care-givers claim that their care giving activities does not affect their agricultural performance as they can provide care in their spare time when they are not working in the field.
6.3.1 Analysis of the distribution of caregivers in Zimbabwe

As can be seen from table A6 (appendix) and the pie chart (fig 6.6), women take up most of the care giving roles. Out of a total of 1080 care-givers trained by the Zimbabwe Red Cross Society only 117 were men. Thus 84% of those trained are women and 16% are men. In all provinces the story remains the same - very few men are volunteering for training as care-givers and among those trained there is greater attrition rate among men than among women. In Goromonzi District one out of every ten of care-givers in the community was male. Njawaya L ‘s(1995) study of care-givers in Manicaland found out that the majority of the caregivers were women in their childbearing ages.

![Pie chart showing gender distribution of caregivers](image)

**Fig 6.6. Overall percent distribution of caregivers by gender**

Bindura has the lowest number males volunteering for training as caregivers while Chipinge in Manicaland more men have trained as care-givers than women. Culturally, women traditionally play a major role in caring for the sick in their families and in their communities hence the results are not surprising. The emergence of HIV has seen more women volunteering to take up care giving roles. These women are mostly involved in community home based care programmes whereby they offer their services in their household's extended families and also in the community. What is disturbing however is the fact that the important role of caring for the sick in the community received very little budgetary allocation.

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17 ZRCS, 2005
from the state, yet operational cost associated with care giving are very high. Care givers often do their job under fairly difficult circumstances and without basic provisions for their own protection such as gloves, soap and disinfectants for hygienic service provision.

![Number of caregivers trained by Redcross in Zimbabwe](image)

**Fig 6.7 Number of caregivers trained by Redcross in Zimbabwe**

### 6.3.2 The Cost of Caring by Care-Givers in Monetary Terms

A basic analysis of the operational cost of care-giving shows that community care givers are donating an average of two days per week to community care-giving or 4 months per annum. Using the minimum wage salaries of lowest paid health worker, each of these care givers are donating to community Z$10million per annum (or US$400 at official exchange rate) and in total Z$10billion in service provision. There are very few professionals in Zimbabwe that are as charitable. Given that the bulk of the volunteer care givers are living on less than US $1.50 per day, it is morally questionable whether it is fair and just for Zimbabwe government to insist on the rural poor paying such high donations.

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ZRCS (2005)
Care-givers are often forced to use their own resources for transport (often walk but sometimes pay for their own transport to visit distant patients). When they run out of basic provisions of their trade - care-givers often use their own resources to buy disinfectant soap for their own safety and sometimes must bring food supplies (especially vegetables) to destitute patients. The basic budget for care-giving to ensure adequate provision for such basic supplies would be Z$100,000 excluding gloves or Z$1.2billion worth of supplies per year for 1000 care givers operating in rural communities. District allocations of AIDS levy are very limited and inadequate to provide for the needs of frontline care-givers to whom it seldom trickles down. Government and National AIDS Council must consider ways of supporting the services offered by community care-givers and for ensuring that at least care givers receive as a matter of priority adequate provisions for safe delivery of their free services.

6.4 Socio economic characterization by gender and HIV/AIDS status

6.4.1 Socio economic comparison of all male headed and female headed households

The analysis below shows that the family sizes of the male-headed households are more than those for the female-headed households but there is no significant difference in the size of the family. This is different with what is expected but the male-headed households could be having greater families since they have more income hence they can be able to look after more dependents as compared to the female-headed households. The male-headed households tend to have more cattle as compared to the female-headed ones. Usually women are dispossessed of their assets when their husbands die such that women have fewer assets as compared to men however this is not significant. The asset /wealth index also supports this view as the males have a higher index of 23 as compared to females with an index of 20.
Table 6.2. Socio economic comparison of male headed and female headed households

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male headed</th>
<th>Female headed</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family size</td>
<td>5.51</td>
<td>5.30</td>
<td>0.52</td>
</tr>
<tr>
<td>Age of household head</td>
<td>47.08</td>
<td>48.31</td>
<td>-0.44</td>
</tr>
<tr>
<td><strong>Assets /wealth owned</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cattle owned</td>
<td>1.44</td>
<td>0.95</td>
<td>1.25</td>
</tr>
<tr>
<td>Total land area</td>
<td>3.33</td>
<td>3.15</td>
<td>0.52</td>
</tr>
<tr>
<td>Total land cultivated</td>
<td>2.54</td>
<td>2.24</td>
<td>1.04</td>
</tr>
<tr>
<td>Total income</td>
<td>171 000</td>
<td>138 000</td>
<td>0.59</td>
</tr>
<tr>
<td>Asset/wealth index</td>
<td>23.08</td>
<td>20.08</td>
<td>1.27</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>145800</td>
<td>1051000</td>
<td>1.728*</td>
</tr>
<tr>
<td><strong>Crop choice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>2.18</td>
<td>1.76</td>
<td>2.093*</td>
</tr>
<tr>
<td>%land allocated to maize</td>
<td>50.10</td>
<td>50.10</td>
<td>-0.06</td>
</tr>
<tr>
<td>Area under cash crops</td>
<td>0.37</td>
<td>0.26</td>
<td>0.97</td>
</tr>
<tr>
<td>Area under legumes</td>
<td>0.29</td>
<td>0.33</td>
<td>-0.31</td>
</tr>
<tr>
<td><strong>HIV &amp; AIDS factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of orphans</td>
<td>1.08</td>
<td>1.44</td>
<td>-0.93</td>
</tr>
<tr>
<td>Number of deaths</td>
<td>1.54</td>
<td>1.54</td>
<td>0.00</td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>3.77</td>
<td>3.26</td>
<td>0.94</td>
</tr>
<tr>
<td><strong>Impact variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food self sufficiency</td>
<td>0.81</td>
<td>0.75</td>
<td>0.52</td>
</tr>
<tr>
<td>Maize yield/ha</td>
<td>748</td>
<td>721</td>
<td>0.30</td>
</tr>
<tr>
<td>Food security index</td>
<td>1.70</td>
<td>1.38</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Source: survey data *Significant at 5% level

Male-headed households have more land area as compared to the female-headed ones. Usually women have fewer assets and are marginalized in terms of land ownership such that the analysis results are the ones, which were expected. Due to the fact that the females own less land it also means that they will
cultivate less areas. In terms of income the female headed households have less income as compared to the male headed ones mainly because the males are usually employed elsewhere formally or informally such that they have more income at their disposal whereas the females rely more on farming for their income. Since the male-headed households have more income they are bound to spend more whereas the females spent less as they have less income and this is significant at the 5% level.

In terms of number of crops that are grown the male-headed families significantly grow more crops as compared to the female-headed households. They are more diversified. Diversification implies that the household is food secure and can venture into other crops that can improve the income rather than food security of the household. The percentage of land that is allocated to maize for the analysed households is equal with households allocating 50% of their land to maize. Since the male have more income at their disposal they are able to venture into the growing of cash crops and thus can allocate some of their land to growing cash crops. The females however allocate some of their land to growing legume crops rather than cash crops. Legumes for example groundnuts and roundnuts are considered to be traditionally crops for women and this explains why women grow more of the legume crops.

Women as highlighted earlier in the studies bear the brunt of the epidemic. The female-headed households in this analysis tend to have more orphans in their households. Since they are more caring women are expected to take care of the orphans that are left behind when their parents die of HIV & AIDS related illnesses. The weighted index of the sick is however higher for the male headed families as compared to their female counterparts. Generally the male-headed households from the analysis are more food secure, more self-sufficient and produce higher yields as compare to the female-headed households.

6.4.2 Socio economic comparison of HIV & AIDS affected male headed and female-headed households

Both types of households do not own many cattle. This can be because since they are all affected the cattle might have been sold to get money to pay for hospital bills, buy drugs, and transport the sick patient to the hospital or at the funeral. The males however still have more land that is cultivated and their total land area is bigger as compared to their female counterparts. Women are usually dispossessed of their land or assets after the death of their husbands such that they remain with little or no assets at all. However this is not significant and there is a negative relationship. These households tend to spend less on essential items as compare to those that are less affected since most of their money is used when taking are of the sick and at the funerals.
There is a significant negative gender difference in area allocated to cash crops and on the number of crops that households grow. The male-headed household with HIV and AIDS continue to diversify and grow cash crops while affected female-headed households shift out of cash crops. Since male-headed households have more income from other formal or informal jobs they can afford to diversify and grow more crops in addition to maize and still remain food secure. The time that women spend on care-giving roles is often time lost from productive work in their own fields. Women however still continue to grow the legume crops, which are culturally female dominated crops.

The male-headed household allocated relatively less land to food crops than the female-headed households and to affected males. With price controls having reduced maize crop into a subsistence crop, there is no incentive for households to grow surplus acreages of maize over and above their food requirements. Those households allocating more land to maize are concerned about their food security and may also be trying to compensate for their low yields per unit area. Cash crops provide better returns in terms of income. Female-headed households are concerned about growing enough food for the family. The affected female households invest very little into maize based farming compared to the male headed households growing cash crops who tend to invest more of their income into their cash cropping.

The female-headed households enjoy marginally higher levels of food security and food self-sufficiency than the male-headed households. They are also more productive in terms of their maize yields as compared to the male-headed households. Since HIV and AIDS affect females more, one would have expected that they are less food secure and obtain lower maize yields. But they appear to have offset the impact sufficiently by adopting cost and labor saving technologies for their maize based farming system. The analysis shows that HIV & AIDS affected female-headed households are more self-sufficient compared to male-headed households.
Table 6.3 Socio economic comparison of HIV & AIDS affected male headed and the female-headed households

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male headed</th>
<th>Female headed</th>
<th>T-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family size</td>
<td>5.38</td>
<td>5.81</td>
<td>-0.77</td>
</tr>
<tr>
<td>Age of household head</td>
<td>48.29</td>
<td>49.06</td>
<td>-0.20</td>
</tr>
<tr>
<td><strong>Assets /wealth owned</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cattle owned</td>
<td>0.90</td>
<td>0.71</td>
<td>0.55</td>
</tr>
<tr>
<td>Total land area</td>
<td>3.29</td>
<td>3.42</td>
<td>-0.25</td>
</tr>
<tr>
<td>Total land cultivated</td>
<td>2.21</td>
<td>2.47</td>
<td>-0.61</td>
</tr>
<tr>
<td>Total income</td>
<td>164000</td>
<td>202000</td>
<td>-0.42</td>
</tr>
<tr>
<td>Asset/wealth index</td>
<td>20.22</td>
<td>19.29</td>
<td>0.46</td>
</tr>
<tr>
<td>Total expenditure</td>
<td>938 000</td>
<td>1 086000</td>
<td>-0.76</td>
</tr>
<tr>
<td><strong>Crop choice</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of crops grown</td>
<td>2</td>
<td>2.5</td>
<td>-2.434*</td>
</tr>
<tr>
<td>% of land allocated to maize</td>
<td>66.29</td>
<td>46.73</td>
<td>-0.11</td>
</tr>
<tr>
<td>Area under cash crops</td>
<td>0.26</td>
<td>0.56</td>
<td>-1.886*</td>
</tr>
<tr>
<td>Area under legumes</td>
<td>0.40</td>
<td>0.35</td>
<td>-0.24</td>
</tr>
<tr>
<td><strong>HIV &amp; AIDS factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of orphans</td>
<td>1.63</td>
<td>0.71</td>
<td>1.737*</td>
</tr>
<tr>
<td>Number of deaths</td>
<td>1.86</td>
<td>1.82</td>
<td>0.11</td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>4.07</td>
<td>5.31</td>
<td>-1.946*</td>
</tr>
<tr>
<td><strong>Impact variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maize yield/ha</td>
<td>759</td>
<td>748</td>
<td>0.32</td>
</tr>
<tr>
<td>Food self sufficiency</td>
<td>0.91</td>
<td>0.73</td>
<td>1.11</td>
</tr>
<tr>
<td>Food security index</td>
<td>1.42</td>
<td>1.33</td>
<td>0.39</td>
</tr>
</tbody>
</table>

*Significant at 5% level

Source: survey data

There is a significant difference in the number of orphans being cared for in male versus female-headed household. The two parents, male-headed families are entrusted with more orphans than the female-headed households. The weighted index of the sick, which is a measure of severity of HIV and AIDS, is significantly higher in male-headed households. As the number of people who are sick increases,
more resources - in terms of money and productive time - are diverted to take care of the sick thus negatively affecting agricultural productivity.

6.4.3 Socio economic comparison of HIV & AIDS less affected male headed and female-headed households

Less affected households suffer the impacts of HIV & AIDS but only to a lesser extent. The female headed households have less assets as compared to the male headed households but posses almost the same amount of land showing high degree of gender neutrality in security of tenure. (Table 6.4 below.

| Table 6.4. Socio economic comparison of HIV & AIDS less affected male headed and female-headed households |
|--------------------------------------------------|-------|-------|------|
| Variable                                         | Male headed | Female headed | T-value |
| Demographic factors                              |       |       |      |
| Family size                                      | 5.17  | 5.19  | 0.04 |
| Age of household head                            | 45.67 | 47.19 | -0.38|
| Assets /wealth owned                             |       |       |      |
| Number of cattle owned                           | 2.28  | 1.02  | -1.65|
| Total land area                                  | 1.21  | 1.60  | -0.67|
| Total land cultivated                            | 1.37  | 1.22  | -0.91|
| Total income                                     | 134 8900 | 99500 | -0.70|
| Asset/wealth index                               | 27.50 | 19.86 | -1.61|
| Total expenditure                                | 2 064 000 | 999 700 | 2.26*|
| Crop choice                                      |       |       |      |
| Number of crops grown                            | 1.83  | 1.71  | -0.43|
| % area allocated to maize                        | 31.16 | 56.47 | -1.61|
| Area under cash crops                            | 0.29  | 0.63  | 0.69 |
| Area under legumes                               | 0.18  | 0.28  | -0.67|
| HIV & AIDS factors                               |       |       |      |
| Number of orphans                                | 1.50  | 1.14  | -0.63|
| Number of deaths                                 | 1.17  | 1.12  | 0.14 |
| Weighted index of the sick                       | 1.97  | 2.05  | 0.10 |
| Impact variables                                 |       |       |      |
The asset/wealth index of the male-headed households is higher than that of female-headed households for reasons highlighted above. For the less affected households, both the males headed and female-headed households grow the same crops. The male headed household relatively more of both maize and cash crops than the female-headed household primarily because of his superior access to financial resources and ownership of his own team of oxen for draft power. However in relative terms, male-headed households still dominate growing of cash crops whilst women still specialize in the growing of legumes. Female-headed households still enjoy superior yields for maize and greater levels of self-sufficiency

Since the female-headed less affected household have more time for crop production compared to the HIV & AIDS affected female households, one would have expected their yields to be considerably higher but this is not so. This evidence point to the uncertainty regarding the extent to which labor is a constraint to productivity in households that are affected versus those that are less affected by HIV and AIDS.

The weighted index of the sick is high for the female headed households since they are the ones who take care of those who are sick with HIV & AIDS related illnesses although this is not significant. The number of orphans remains higher for male-headed household compared to the female - headed household.
6.5 Discussion of Results from Econometric Analysis

To provide convincing evidence on the significance of gender in explaining the impact of HIV and AIDS on agriculture and food security performance, one has to resort to econometric analysis. The models are fundamentally similar to those discussed in previous chapters. The only difference is that gender variables are treated with much greater detail and innovation. For example, gender is expected to affect any of the two major dependent variables either directly or indirectly, separately or interactively. The model accommodates possible interactions between gender and non-gender variables according to our apriori expectations.

When an interaction effect is present, the impact of one variable depends on the level of the other variable. When interaction effects are present, it means that interpretation of the individual variables may be incomplete or misleading (Pedhazur and Schmelkin, 1991). In other words, the coefficient ($\beta_1$) of a given variable $X_1$ involved in the construction of an interactive term represents only part of the effect of $X_1$ on the dependent variable; the remaining effect is in the interaction term. Although there are a variety of logically equivalent ways of constructing these interaction variables the simplest, both in demonstration and execution, is multiplication. The interaction variable is constructed by multiplying component variables. The importance of the interaction is measured by the strength of the composite variable but this new variable cannot measure causation or degree of correlation. The statistical interaction variables can be entirely uncorrelated with any or all of the variables from which it was constructed (Foulger D, 1979).

6.5.1 Econometric Analysis of the Factors Affecting Food Security

Food security involves availability, accessibility and affordability of a commodity in this case its maize. From the Table of Results above, food security of a household is significantly and negatively affected by gender of household head and gender interactions with number of crops, positively affected by gender interactions with area cultivated and number of crops grown as well as the size of the family. This analysis shows that gender features prominently in accounting for observed variations in food security across households. When gender is taken into account, the direct impact of HIV and AIDS on food security through the effect of increased morbidity remains negative but number of orphans tend to increase food security through their labour increasing effect.
### Table 6.5 Food security regression model

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Food Security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter estimates</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.83 (1.34)</td>
</tr>
<tr>
<td>Gender and total income</td>
<td>0.008 (0.09)</td>
</tr>
<tr>
<td><strong>Gender and total land cultivated</strong></td>
<td><strong>0.28 (3.01</strong>*)**</td>
</tr>
<tr>
<td>Gender and HIV</td>
<td>0.29 (0.86)</td>
</tr>
<tr>
<td>Gender and assets</td>
<td>0.05 (0.48)</td>
</tr>
<tr>
<td><strong>Maize yield per hectare</strong></td>
<td><strong>0.46 (4.58</strong>*)**</td>
</tr>
<tr>
<td>Total nitrogen in kgs applied to maize crop</td>
<td>0.072 (0.73)</td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>-0.35 (-1.03)</td>
</tr>
<tr>
<td>Number of orphans</td>
<td>0.01 (0.13)</td>
</tr>
<tr>
<td>Level of education member 1</td>
<td>-0.0082 (-0.93)</td>
</tr>
<tr>
<td><strong>Sex of member1(Household head)</strong></td>
<td><em><em>-0.34 (-1.78</em>)</em>*</td>
</tr>
<tr>
<td>Size of the family</td>
<td>-0.20 (-2.18**)</td>
</tr>
<tr>
<td><strong>Gender and number of crops</strong></td>
<td><strong>0.22 (2.07</strong>*)</td>
</tr>
<tr>
<td>R</td>
<td>0.73</td>
</tr>
<tr>
<td>R square</td>
<td>0.54</td>
</tr>
<tr>
<td>Adjusted R square</td>
<td>0.46</td>
</tr>
<tr>
<td>Durbin Watson</td>
<td>2.28</td>
</tr>
</tbody>
</table>

### 6.5.2 Econometric analysis of the factors affecting maize productivity

Maize is an important crop in smallholder agriculture grown by all farmers to meet their food requirements. Productivity of maize is measured in terms of output per hectare. Table 6.6 summarizes the results.
### Table 6.6. Productivity regression model

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Maize Yield /ha</th>
<th>Beta estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>270.300 (0.63)</td>
<td></td>
</tr>
<tr>
<td>Sex of member1</td>
<td>0.061 (0.28)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender and assets</strong></td>
<td>0.214 (1.754*)</td>
<td></td>
</tr>
<tr>
<td>Gender and HIV</td>
<td>-0.42 (-1.11)</td>
<td></td>
</tr>
<tr>
<td>Gender and total land cultivated</td>
<td>-0.067 (-0.62)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender and total income</strong></td>
<td>0.45 (4.56***)</td>
<td></td>
</tr>
<tr>
<td>Maize seed per ha</td>
<td>0.18 (1.76*)</td>
<td></td>
</tr>
<tr>
<td>Total nitrogen / ha</td>
<td>0.084 (0.84)</td>
<td></td>
</tr>
<tr>
<td>Type of group or social club</td>
<td>0.14 (1.40)</td>
<td></td>
</tr>
<tr>
<td>Weighted index of the sick</td>
<td>-0.38 (-1.03)</td>
<td></td>
</tr>
<tr>
<td>Level of education member 1</td>
<td>-0.071 (0.71)</td>
<td></td>
</tr>
<tr>
<td>Size of the family</td>
<td>-0.047 (-0.48)</td>
<td></td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>0.64</td>
<td></td>
</tr>
<tr>
<td><strong>R SQUARE</strong></td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td><strong>Adjusted R square</strong></td>
<td>0.31</td>
<td></td>
</tr>
</tbody>
</table>

As can be seen from the regression results above a number of factors are significant in explaining the productivity. The gender-assets interaction term, gender -income interaction term and the maize seed that is used per ha are significant variables. Female-headed households usually do not have any assets or have fewer assets compared to their male counterparts. The coefficient, which is positive, in this case is not as is expected since it is showing that through gender, assets are having an interactive effect, which is positive on the maize yield per ha, and this is significant at the 10% level.

The gender and income term is also positive and significant at 1% and this is not what is expected. This means that as we move from the male headed households to the female headed households the income is increasing and as it increases the maize yield /ha for the female headed households increases. We would expect the female headed household to have less income however they may be getting more income from donations from NGOs of from the government. These women are those affected by the epidemic hence it maybe because the mentioned organizations are increasing their income. The maize seed
per hectare has a positive coefficient. As the maize seed is increased it means that the input is spread over a larger area and higher yields are expected.

The gender HIV & AIDS interaction term has a negative coefficient and this is expected although this is not significant. There is thus an interaction between the gender and HIV & AIDS that is leading to a decrease in the productivity. The female-headed households are affected more since they usually take productive time off the fields and use it to care for the sick. Agricultural activities thus suffer and less yields are produced due to a reduction the area that is cultivated. The gender -total land interactive term also shows a negative relationship. Women usually cultivate less acreages as compared to males and the relationship is thus expected. By cultivating less area the yield is expected to decrease.

Family size and morbidity variable show a negative relationship with productivity. If labor supply was an important determinant, one would expect to see an increase in yield as the size of the family increases. If indeed labor is not a factor in accounting for observed differences in yield across families then one would necessarily NOT expect HIV and AIDS to have a significant impact on agricultural productivity. The negative impact of HIV and AIDS through morbidity is expected since as sickness increases more and more resources - people's time and cash-is made available - are taken out of farming inputs into health care.

The type of social club and the total nitrogen that is applied show positive relationships with the maize yield/ha. Those households that belong to an agricultural group could be gaining in terms of inputs and technology. The knowledge that they get from the clubs can also help them improve their yields. The nitrogen applied improves efficiency in production hence increasing the yield.

6.6. Summary

The number of women infected by HIV is higher than men and those affected are in their most productive ages (15-49 years). This can be attributed to the fact that women have low social and economic status. It was also shown that women usually take up the care giving roles such that the burden on their shoulders is great because of HIV & AIDS. Since women are affected more by the pandemic especially on the care giving part there is need to put incentives for example paying the caregivers rather than focus on volunteers so that men can come up and do the jobs thus reduce the burden on women. It can thus be concluded that HIV & AIDS disproportionately affect women than men. The analysis done in this chapter lends a weight of evidence to the often asserted reality that women headed families are suffering disproportionately from the impacts of HIV & AIDS than traditional male headed two parent households. Those female headed household end up with lower incomes as a result of HIV & AIDS. These vulnerable
families are starting off with less income and once they divert part of the meagre income to caring for the sick, then their agriculture suffers from severe budget constraints culminating in reduced yields and greater risk of food insecurity. Female-headed households have less income mainly because they have a lower income earning capacity compared to men.

Without access to agricultural credit markets, those families without sufficient means and who are forced to spend on home based caring for their sick shall not afford to acquire agricultural inputs without policy supported subsidies. Without adequate investments in high yielding inputs, these families will suffer reduced yields especially from maize culminating in food insecurity and continued dependence on food aid. Yet with provision of affordable agricultural inputs on credit, the impact of HIV and AIDS on productivity and food security of vulnerable female-headed household would be potentially reversed.

In conclusions there is no doubt that HIV & AIDS has had negative impacts on food security and livelihoods of rural communities particularly on female-headed households. Most of the households in the study area only had one surviving female head primarily due to the HIV & AIDS epidemic. The greatest tragedy in Zimbabwe is that the affected vulnerable households can self sustain their livelihoods through adoption of higher yielding farming system and purchased technologies already familiar to them. Financial market and producer pricing policies are failing to address the needs of the vulnerable that need improved access to markets and to yield increasing technologies that can sustain higher yields. The death of the most productive people has reduced flow of disposable incomes into the rural families, and policy innovations must come in to minimize impact on productivity.
7. Empirical Explorations of Impact of HIV and AIDS on Asset Wealth Holdings of Rural Households

7.1 Introduction

It is generally understood that HIV & AIDS has negative implications on asset wealth status of rural households. A number of case studies from as far back as the early 1990s provided first evidence of HIV and AIDS induced loss of productive assets through sales to finance cost of caring for the sick, and through the customary practice of dispossessing grieving widows of remaining assets following death of her spouse. (Mutangadura et al 1999; Stoke 2003). Barnett and Rugalema (2001) assert that HIV & AIDS reduces ability of household to hold on to their old assets and to acquire any new ones. In an effort to reduce the adverse impacts of HIV & AIDS on livelihood, some rural households resort to the disposal of productive animals as a short-term mitigation strategy (Chen and Dunn, 1996). This short-term coping strategy often results in the permanent loss of income from livestock products, reduction in agricultural production performance due to loss of draft power and manure from animals, increased risks of food insecurity even in years of normal rainfall plus reduced capacity to cope with drought-induced famines. However not all households that liquidate part of their cattle herd suffer in this manner. Indeed some households seem to be more resilient in maintaining adequate productive stock of farm assets in spite of increased off take induced by HIV and AIDS.

This chapter explores the extent to which empirical evidence from Zimbabwe lends weight to the common assertion of negative impact of HIV and AIDS on asset holdings. Using a combination of qualitative and quantitative analysis of cross sectional data, the study first and foremost reveals the high incidence of farm asset-poverty among rural population regardless of their HIV and AIDS status. However there is anecdotal evidence confirming the negative relationship between HIV and AIDS status of households and amount of farm asset holdings. This relationship is not always statistically significant in the presence of other important social and economic factors affecting asset dynamics in rural households. There is compelling and statistically significant evidence that HIV and AIDS afflicted households do sell more livestock than those families that are presently less affected by HIV and AIDS.

A number of factors account for the disparities in asset holdings across households but most important are age of household and whether the household had already suffered adult mortality due to HIV and AIDS. Age of a given household is defined as the number of years that a household has been in
existence. The acquisition and disposal of physical assets by HIV & AIDS affected rural households is assumed related to the age of the households. Rural households have different rates of asset accumulation and disposition. On the other hand, adult mortality has adverse impacts on the direction of asset flow in HIV & AIDS affected rural households. The death of an adult male usually reduces or virtually removes the capacity of households to acquire and/or hold on to their current assets whilst the death of an adult female also reduces the household’s capacity to manage the household which sometimes result in unwarranted sell of physical assets. Traditional and cultural practices of inheritance in most African societies usually do not protect women and children in the event of death of the husband resulting in the mother and children losing most of their productive assets after the death of the spouse. Thus the need to also ascertain the impact that HIV & AIDS has had on asset dynamics in the studied communities.

### 7.2 Discussion of Findings from Qualitative Analysis

#### 7.2.1 Some Key Relationships Affecting Asset Holdings

a) Relationship Between Household Age and Adult Morbidity and Mortality

Age of a household is not a significant factor in explaining the presence of adult morbidity in HIV& AIDS affected rural households though it is significant when it comes to adult mortality. Almost an equal proportion of households living with adult sickness is found within both young and mature or old households. On the other hand a greater percentage of older households have experienced death of an adult household member (Table 7.1).

<table>
<thead>
<tr>
<th>Table 7.1 Age of households and Adult morbidity and mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Young age households</td>
</tr>
</tbody>
</table>
b) Relationship Between Age of Household and Asset Holdings

The results in Table 2, A1 and A2 show that there is very little evidence to show any relationship that could exist between asset holding capacity and time in existence of a household. Generally less than half of the households between both the young and aged households own essential productive assets such as cattle, ox-drawn plough and small ruminants. Only one household among the old households owns another form of draft power in the form of donkeys. Table 7.2 confirms some of the results.

Table 7.2 Mean Livestock holdings among households of different age

<table>
<thead>
<tr>
<th></th>
<th>Cattle</th>
<th>Goats</th>
<th>Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early age households</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0-10 years)</td>
<td>4 (1)</td>
<td>2.1 (0.3)</td>
<td>6 (1)</td>
</tr>
<tr>
<td>Old age households</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11 and above)</td>
<td>3 (0.2)</td>
<td>2.3 (0.1)</td>
<td>6 (0.4)</td>
</tr>
</tbody>
</table>

Mean livestock holdings among households that own at least one of the indicated types of livestock, are still very low. There is no significant difference between young and old households that own cattle, goats and poultry.

c) Adult Morbidity and Mortality and Asset Ownership

The effect of HIV & AIDS on asset holding capacity of rural households is detrimental and even worse when the society affected is already plagued by general asset poverty. Results Section 7.2 above also
confirms this assertion. Table A3 and A4 (Appendix) indicate that generally most households in the study communities do not hold any of the reported assets regardless of whether they have suffered adult illness and mortality or not. Shown in Table 7.3 are the average livestock holdings for the different types of households that own the indicated livestock holdings.

Table 7.3 Mean livestock holdings among households that have suffered adult illness and mortality

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Cattle</th>
<th>Goats</th>
<th>Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With</td>
<td>183</td>
<td>1 (0.1)</td>
<td>0.6 (0.1)</td>
<td>4.2 (0.4)</td>
</tr>
<tr>
<td>Without</td>
<td>141</td>
<td>1.2 (0.2)</td>
<td>0.9 (0.1)</td>
<td>3.6 (0.4)</td>
</tr>
<tr>
<td>Adult mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>With</td>
<td>247</td>
<td>1 (0.2)</td>
<td>0.7 (0.1)</td>
<td>3.8 (0.3)</td>
</tr>
<tr>
<td>Without</td>
<td>77</td>
<td>1 (0.1)</td>
<td>0.6 (0.1)</td>
<td>4 (0.4)</td>
</tr>
</tbody>
</table>

Source: survey data

*NB ( ) standard error values

Though there is no significant difference between households that have suffered adult illness and those that have suffered adult mortality in their mean livestock holdings, the results also show endemic asset poverty in the rural communities even among households that own the livestock assets. The apparently very low average cattle holdings of approximately 1 cattle per household among the households with and without adult sickness and mortality is not surprising given that the overall average cattle holdings for the whole sample is approximately 3 cattle per household. This is also a low figure given the importance of cattle in most rural communities in terms of its major contribution in most farm productive activities and its storage as a major form of wealth in rural households.

Land is an important asset in rural households. It provides the basis of most rural livelihoods and as such little or no access to it increases poverty in rural communities. In this study results show that there is also no apparent relationship between years a household has been in existence and the land that they own. Generally on average households have very small pieces of land regardless of their age and HIV & AIDS status. There are no significant differences in land ownership between young and mature household, household that have suffered adult sickness and deaths and those that didn’t. Results are shown in Table 7.3 below.
Table 7.4 Land Ownership and HIV & AIDS in Rural Households

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Total Land (acres)</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early age households (0-10 years)</td>
<td>47</td>
<td>3.21</td>
<td>1.7</td>
</tr>
<tr>
<td>Old age households (11 years and above)</td>
<td>272</td>
<td>3.29</td>
<td>1.9</td>
</tr>
<tr>
<td>Without adult mortality</td>
<td>77</td>
<td>3.04</td>
<td>1.5</td>
</tr>
<tr>
<td>With adult mortality</td>
<td>247</td>
<td>3.35</td>
<td>1.9</td>
</tr>
<tr>
<td>With sick members</td>
<td>183</td>
<td>3.32</td>
<td>1.9</td>
</tr>
<tr>
<td>Without any sick member</td>
<td>141</td>
<td>3.25</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Source: survey data

7.2.2 Characterization of Asset Transactions

Evidence from the rural areas of Zimbabwe show that there is very limited volume of buying and selling of assets. (Table 7.5 and Table A5 in the Appendix). There are no significant differences observed between households that have suffered adult illness and adult mortality and those that have not in terms of their pattern of transactions of major assets such as cattle and the ox-drawn plough.

Table 7.5 Adult sickness and mortality and livestock asset transactions

<table>
<thead>
<tr>
<th></th>
<th>Cattle</th>
<th>Goats</th>
<th>Donkeys</th>
<th>Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>With adult illness (n=183)</td>
<td>3.6</td>
<td>4.4</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>% that bought at least 1</td>
<td>4.4</td>
<td>6</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td>% that sold at least 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
HIV & AIDS related deaths increase slaughtering of livestock assets. Cattle and other forms of livestock are usually slaughtered at the funeral of an adult member of the household. Approximately 56% of the households that suffered adult mortality slaughtered one or more livestock at funerals of adult members. Table 7.6 shows that at least one cattle was slaughtered in 31% of the households. Goats are also becoming a popular target for slaughter at funerals in most rural communities due to the scarcity of cattle.

<table>
<thead>
<tr>
<th>Without adult illness (n=141)</th>
<th>% that bought at least 1</th>
<th>1.4</th>
<th>2.8</th>
<th>0</th>
<th>12.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>% that sold at least 1</td>
<td>5</td>
<td>2.8</td>
<td>0</td>
<td></td>
<td>5.5</td>
</tr>
<tr>
<td>With adult mortality (n=247)</td>
<td>% that bought at least 1</td>
<td>2.4</td>
<td>3.6</td>
<td>0</td>
<td>13.8</td>
</tr>
<tr>
<td>% that sold at least 1</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td></td>
<td>4.5</td>
</tr>
<tr>
<td>Without adult mortality (n=77)</td>
<td>% that bought at least 1</td>
<td>4</td>
<td>3.9</td>
<td>0</td>
<td>18.2</td>
</tr>
<tr>
<td>% that sold at least 1</td>
<td>4</td>
<td>5.2</td>
<td>0</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Survey data

Table 7.6 Asset Transfers in Rural Communities that Suffered Adult Mortality

<table>
<thead>
<tr>
<th>Proportion of households that slaughtered livestock at funeral of member</th>
<th>Type of livestock slaughtered</th>
<th>Proportion of households that slaughtered each type of livestock</th>
</tr>
</thead>
<tbody>
<tr>
<td>56%</td>
<td>Cattle</td>
<td>31%</td>
</tr>
<tr>
<td></td>
<td>Goats</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Chickens</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Source: Survey data

The results also indicate that for the households that slaughtered some form of livestock at the funeral of an adult member, in most instances the slaughtered livestock belonged to the deceased. In approximately 86% of the cases when cattle was slaughtered it belonged to the deceased person whilst in 77% instances when goats where slaughtered they belonged to the deceased individuals. These results are shown in Table 7.7 below.

The implications of these results are very clear. It shows that the deceased families are losing their livestock holdings and given that the average cattle holdings for each household that has suffered adult mortality is approximately 1 cattle per household then it means another adult death is likely to leave such a family with no cattle at all.
Table 7.7 Ownership of the slaughtered livestock

<table>
<thead>
<tr>
<th>Type of Livestock</th>
<th>Frequency owner of the slaughtered livestock</th>
<th>Percent owner of the slaughtered livestock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deceased household</td>
<td>80</td>
<td>86</td>
</tr>
<tr>
<td>Relatives</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Community members</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bought</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Goats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deceased household</td>
<td>49</td>
<td>77</td>
</tr>
<tr>
<td>Relatives</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Community members</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bought</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Chickens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deceased household</td>
<td>2</td>
<td>67</td>
</tr>
<tr>
<td>Bought</td>
<td>1</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Survey data

Results in Table 7.8 below, show that traditional and cultural values regarding inheritance customs and norms in the rural communities are also taking care of the deceased’s family. In approximately 25% cases where the deceased owned an ox drawn plough the household indicated that in 20% of those cases the asset remained with the family of the deceased and was not given to other relatives. Where the deceased individual owned cattle and a scotch cart, these also remained at the deceased’s household in most of the cases.

Table 7.8 Distribution of some of the assets owned by the deceased adult member

<table>
<thead>
<tr>
<th>Assets</th>
<th>Assets Ownership Status of deceased</th>
<th>Distribution of Asset at Death of Owner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
</tr>
</tbody>
</table>

115
<table>
<thead>
<tr>
<th>Asset Type</th>
<th>Oxdrawn Plough</th>
<th>Cattle</th>
<th>Scotch Cart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remaining at Homestead</td>
<td>49</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Given to Relatives</td>
<td>10</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

| Source: Survey Data |

### 7.2.3 Summary

Asset poverty is endemic in Zimbabwe's rural communities. Over the past three years, most households have further suffered net reductions rather than additions to their productive assets holdings. Of particular concern is that holdings of cattle often considered to be a yardstick of vibrancy and potential for rapid recovery from droughts and famine has dwindled with majority of agricultural households reporting less than two cattle units. Absence of cattle holdings in the presence of asset wealth holdings in some of the household most affected by HIV and AIDS indicate the possibility that cattle may no longer be a preferred asset for storing wealth. Given that cattle remains most profitable the only viable explanation is the possibility that HIV and AIDS affected families switching from cattle to other types of assets perhaps not covered in the study (e.g. household goods, kitchen assets) that are considered safer from the risk of dispossession of the grieving widow when her ill spouse dies of HIV and AIDS. This is an area in need of further study and further analysis. The analysis herein has shown that there are no significant difference in asset holdings between HIV & AIDS affected and those less affected agricultural households. Both are categories are victims of asset poverty. The impact of disease is however evident especially on slaughtering of cattle upon death of male head of household. The continued customary practice of slaughtering of cattle to honor the dead with a feast is an issue of serious concern in the face of declining cattle holdings and need important need for recovery of national herd. For the surviving family, resilience and prospects for continued agricultural growth after death of spouse can be irreversibly compromised by forced slaughter of remaining cattle.
7.3 Discussion of Results from Quantitative Analysis

The volumes of net transactions show considerable variability across all households (Fig 7.1). Household asset transactions are affected apriori by a number of social, economic and household-specific family factors. Among the family factors is the HIV & AIDS related factors such as severity of illness and incidence of adult deaths. To what extent are the HIV and AIDS related household factors important in accounting for the disparities in observed volumes of net transactions across the 327 households in the study - in the presence of all other important factors mentioned above. The purpose of the econometric analysis is to test significance of this relationship.

Fig 7.1 Variation in Net Value of Asset Transactions among rural households

7.3.1 Discussion of Results

Table 7.8 Results from the Assets Transaction Model

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Log of Net Value from Asset Transactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net value of transactions</td>
<td></td>
</tr>
<tr>
<td>Net value ($)</td>
<td></td>
</tr>
</tbody>
</table>

117
<table>
<thead>
<tr>
<th></th>
<th>Std. Error</th>
<th>Standardized Beta Coefficients</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.02</td>
<td>15.50</td>
<td>1.12</td>
</tr>
<tr>
<td>With/without sick household members</td>
<td>0.38</td>
<td>-0.19</td>
<td>-1.42</td>
</tr>
<tr>
<td>Number of Aids related adult deaths</td>
<td>0.19</td>
<td>0.14</td>
<td>1.01</td>
</tr>
<tr>
<td>Logarithm of total income</td>
<td>0.19</td>
<td>-0.18</td>
<td>-1.20</td>
</tr>
<tr>
<td>Sex of household head</td>
<td>0.45</td>
<td>-0.40</td>
<td>-2.72***</td>
</tr>
<tr>
<td>Age of household head</td>
<td>0.01</td>
<td>0.50</td>
<td>3.79***</td>
</tr>
<tr>
<td>Marital status of household head</td>
<td>0.35</td>
<td>-0.31</td>
<td>-2.13**</td>
</tr>
<tr>
<td>Size of the family</td>
<td>0.09</td>
<td>0.42</td>
<td>2.91***</td>
</tr>
<tr>
<td>Number crops grown</td>
<td>0.29</td>
<td>-0.17</td>
<td>-1.27</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td></td>
<td><strong>0.76</strong></td>
<td></td>
</tr>
<tr>
<td><strong>R</strong> squared Adjusted</td>
<td></td>
<td><strong>0.43</strong></td>
<td></td>
</tr>
<tr>
<td>Durbin Watson</td>
<td></td>
<td><strong>1.96</strong></td>
<td></td>
</tr>
</tbody>
</table>

*** significant at 1%, ** significant at 2% and * significant at 10%

Though HIV & AIDS related variables are not significantly affecting the net value from asset transactions (Table 7.8), their coefficients show that they are resulting in households selling more assets than they are buying. The asset value of asset transactions increases with households that have adult sickness and those that have suffered adult deaths.

HIV & AIDS could be indirectly affecting pattern of asset transaction in rural households through its effects on other significant household demographic factors included in the model. The presence of HIV & AIDS related adult deaths in a household affects the gender of the household head, the age of the household head, the marital status of the household head and the size of the family. Net value of asset transactions is higher for male headed compared to female head households. Net value from asset transactions also increases with family size. A larger family is likely to have older children of secondary school going age. Thus despite the effect that HIV & AIDS could have on such households, they are likely to dispose more of their assets to invest in education of their children. HIV & AIDS is most likely resulting in larger family sizes, as more orphans are absorbed in relatives’ households.
7.4 Insights from Results

There is general asset poverty in the rural communities involved in this study, which makes it difficult to observe the asset dynamics across space and time. The econometric results show significant impact of HIV & AIDS buying and selling of assets. The presence of HIV related illness and AIDS deaths in rural households increase the selling of physical assets. The common assertion that the AIDS pandemic has resulted in rural families selling their physical assets to cope with demands of the disease is fully supported. However, what cannot be verified is whether the asset being sold to meet expenses were not in effect strategically accumulated in the past precisely in anticipation of such eventualities. Indeed if it is a question of planned accumulations leading to planned liquidations of assets then the concern is unfounded and is of no policy significance. If however the evidence suggests that people are selling productive assets never meant for sale but for sustaining production then observed selling of productive assets by HIV and AIDS affected families becomes a matter of policy concern. The goal of policy in the face of observed asset removals must not be to stop families from making such decisions. The aim of policy must be to assist the bereaved families with options

(a) State supported burial insurance plans to help rural communities cope better with burden of burying their dead without resorting to killing the only remaining few cattle for draft

(b) Provide credible, affordable and accessible financing scheme for acquiring cattle and other productive assets for sustainable agriculture.
8. Conclusions And Policy Recommendations

The Zimbabwean study of Impact of HIV and AIDS on Agriculture and Food Security in Zimbabwe was carried out in Zimbabwe in the context of the EU Funded FANRPAN's regional HIV and AIDS Study. As such the country study was somewhat bounded by a set of regional objectives, processes and the usual sets of constraints that affect implementation of regionally coordinated studies of this magnitude. The Zimbabwe team, which benefited from having conceptualized the original regional proposal and was originally expected to coordinate the research work, identified four important sets of objectives for its country study. The first set of objective was on developing a comprehensive methodology for assessing impact of HIV and AIDS on agriculture.

The second was to conduct sound empirical analysis of the subject using the methodology. And the third was to engage peers, stakeholders and policy makers in a national dialogue on the findings and in collective process of discussing strategies for mitigating impact of HIV and AIDS on African Agriculture. While this report focused on the first two sets of objectives, it is from the third objective that the FANRPAN Zimbabwe team derives perennial motivation to complete the country study. A final team of four people carried out the research navigating a number of challenges along the way. This chapter presents a summary of key processes, findings and highlights some policy issues and recommendations for mitigating impacts of HIV and AIDS on agriculture.

8.1 Summary of Insights and Findings

8.1.1 Development of Comprehensive conceptual framework and analytical approaches for evaluating impact of HIV and AIDS on agriculture and food security

The assessment of impact is as good as the analytical framework that is used. Beyond quick and dirty approaches for flagging issues, impact must be verified through credible methodologies before being turned into policy advice. Zimbabwe team invested considerable studying alternative frameworks for impact assessment and designing one for the project, which is cheap, versatile and consistent with current thinking in the literature. Informed by the literature, the team developed a hybrid conceptual framework for undertaking the Impact Assessment combining insights from livelihoods framework and household optimization frameworks. The livelihood framework provides completeness of coverage of range of
impact areas of interests for development planners and policy makers. The household economic optimization framework provides disciplined consistency in tracking a shock for impacts and scope to differentiate gross initial impacts from net impacts which takes into account rationally expected adaptive responses and coping strategies.

The conceptual framework developed is versatile on its budget requirements, choice of data collection frames - before and after the shock or with and without the shock plus combination and supports multiple analyses using qualitative, basic econometric and programming simulation techniques.

8.1.2 Findings on Macroeconomic Response of State and Non State Actors to HIV and AIDS Crises

a) Limited Capacity at NAC to coordinate and initiate programs for Agriculture:

Since 1999, government has been proactive in enacting HIV and AIDS legislation such as the HIV/AIDS levy and establishment of National Aids Council (NAC). While NAC was instrumental and successful in coordinating a successful education awareness campaign especially in urban areas, programming for rural areas and for agricultural sector has been less effective. Despite the overwhelming need for treatment, care, research and counseling of HIV and AIDS particularly in rural areas, it is disappointing that Ministry of Health and NAC have consistently failed to fully utilize limited resources made available by Government. These limitations call to question the organization capacity of NAC to fully service the needs of other Ministries. It also points to institutional challenges limiting effective coordination at policy and programming level between Ministry of Agriculture and NAC in developing specific educational and mitigation programs for the agricultural sector - rural farming communities and service institutions severely compromised by the disease.

b) Geographic Disparities in Concentration of NGOs working on HIV/AIDS

The non-state actors continue to play a very important role in the campaign against HIV and AIDS. As a collective, their budget is several times greater than that of NAC and government. There is a striking uneven distribution of NGOs working on HIV and AIDS, which must be a matter of national concern. Most NGOs are concentrated in Bulawayo, Harare and Manicaland. Mashonaland West, Mashonaland East and Masvingo seem to be severely under serviced.
c) Limited Focus on Mitigation of Impacts in Agriculture

At the time of the study in 2004, the bulk of programs of NAC as well as NGOs were focused on awareness campaigns, orphan care, prevention of mother to baby transfer. Only a handful of NGOs were involved in programs seeking to increase incomes and in mitigating impact of HIV and AIDS especially in rural areas. Since then agricultural recovery programs have seen some NGOs go into agricultural programming. While NGOs should by all means remain independent from government interventions so as to best complement government, there is greater scope for better coordination of NGO and government programs so as to ensure equitable access of services and support programs by the rural poor.

8.1.3. Findings on the Key Impact of HIV on Smallholder Agriculture and Food Security

a) The Changing Structure of Rural families and Implications on Agricultural Programming

HIV & AIDS pandemic is significantly transforming the structure of rural families and rural communities. The transformation of the rural families into single parent female-headed families has important implications on agricultural planning that Agriculture policy makers and service providers must take into account. The death of young and middle-aged adults has left families without much remittance income, which traditionally has been the major form of agricultural financing in rural areas. The social cost of missing rural agricultural financial markets and of poor agricultural producer pricing policies is bound to rise to considerably heights in this era of HIV and AIDS compared to the early 1980s and 1990s. Single parents raising young children on their own also increase the dependency ratio of young widowed families in rural areas raising their own children as well as orphans. The agricultural prospects of these young widowed families producing enough income to acquire strategic farm assets for agricultural success shall depend on their access to agricultural support and remunerative agricultural markets.

b) HIV & AIDS is Transforming Smallholder Farming System

Households affected by HIV and AIDS tend to utilize less acreage, put most of their reduced area under maize and legumes but less acreage is put under the labor and cash intensive cash crops compared to the households that are less affected by HIV and AIDS. On maize the acreage effect implies an overall reduction in maize primarily because it is not accompanied by any apparent intensification. HIV & AIDS does not seem to have an impact on fertilizer application rates when families have already suffered adult
mortality but seem to result in more fertilizer use in affected households that have not yet suffered adult mortality which are very few. Since maize is the main food crop in Zimbabwe, household, community and national food security is being compromised by the HIV & AIDS pandemic.

HIV & AIDS affected households are not shifting towards higher value crops and technologies and techniques offering higher returns to labor. This is not surprising because no new options of agricultural practices or technologies have been promoted to cater for the needs of these at risk households. Most of the affordable options for diversification - legume, cereal legume inter-cropping, small grains - would require an initial investment of resources and would involve tremendous search costs for HIV/AIDS afflicted households. The options normally available from within involve more labor (e.g. tobacco and paprika) and more cost which are feasible for resource -richer and labor abundant families.

c) HIV and AIDS Impact on Productivity: Negative Impact but Not Significant for Maize

There is a general feeling among development planners that HIV and AIDS is likely to have a negative impact on productivity. While anecdotal evidence confirms that average yields of maize tend to be higher for the less affected group of farmers compared to the more affected group of farmers. However the relationship is not statistically significant - implying that there is no sufficient evidence to reject the hypothesis that the two means are statistically the same. Similarly, higher incidence of HIV/AIDS reduces the likelihood of rural households falling into the category of poor yield performer (in terms of their maize yield falling into the bottom quartile) but it is not one of the significant determinants

For cash crop, the direction of impact is negative and difference in average yields is significant implying that HIV/AIDS adversely affects yields of cash crop.

d) HIV and AIDS Impact on Food Self Sufficiency: Negative Impact but Not Significant

Households self sufficiency index for families ranged from 0% to 35% in 2004 reflecting the famine prevailing in Zimbabwe during the time and the surprising variability in status within a limited geographic space underlining importance of local microclimates and farmer conditions. While HIV and AIDS appear to have a negative impact on household maize self-sufficiency, it does not appear to be a significant determinant of food self-sufficiency under below normal seasonal climatic conditions prevailing in 2003/2004 season. Area under maize adversely affected self-sufficiency, while asset ownership especially cattle had a positive and significant impact on self-sufficiency. Likelihood of a family being self-sufficient was also positively influenced by family labor and asset holdings.
The lack of convincing evidence that HIV and AIDS strongly and negatively affects productivity may suggest that more studies are needed especially under normal climatic conditions. But it could also be the reality that productivity may or may not decrease with HIV reflecting resilience of the Zimbabwean rural farmers.

e) Impact of HIV and AIDS on Household Food Security

Food security is the ability of the household to provide adequate food for its family through market acquisitions or home production. For a household, it is about having the income to acquire food or the capacity to produce it at home. HIV and AIDS affect disposable incomes of affected agricultural families because the male head working in distant urban labor market often is the first to contract the disease and returns home denying the family another form of non-farm income not affected by vagaries of weather. Both affected farmers and less affected farmers as well as development practitioners assert that food security is adversely affected by HIV and AIDS. Empirical evidence is unambiguous - affected families have lower food security index than their less affected neighbors. Econometric also confirms the adverse effect of HIV and AIDS on food security. Households are less afflicted with HIV/AIDS, have bigger families, possess more assets, cultivate bigger acreage are likely to be self-sufficient.

f) Assessing the Impact of HIV and AIDS on Asset Holdings of Agricultural Households

Agricultural populations in rural areas are suffering from very severe asset poverty. The average reported livestock holdings by mature agricultural household stands at 3 cattle, 2 goats and 6 chickens. With such subsistence holdings, the rural households have fairly limited scope for using livestock for adaptive response or as a coping strategy. Given the importance of cattle for draft power, these figures points to a chronic problem of draft power for a majority of the farmers. The low agricultural and farm income also suggest a very low capacity of farmer to save and accumulate productive assets.

The volume and directions of asset transaction determine changes in asset holdings over time. For the period 2001-2004, farmers reported high volume of livestock, slaughtering, selling and buying activities. Development practitioners and farmers themselves assert that HIV and AIDS forces households to sell even their productive livestock and farm assets to finance health and nutritional care of sick member especially when it is male head. If there are any cattle left, the surviving spouse is under pressure to donate a beast for the funeral to honor her departed husband. These customary practices have resulted in 56% of the household being pressured by custom to slaughter a beast for the funeral and another one a year after
for the mandatory cleansing ceremony. Thus 327 household, 150 to 300 cattle might have been slaughtered leaving the community already suffering from HIV and AIDS crises with derived productive asset crises. Shortage of draft power, a major manifestation of this new crises, from which those HIV/AIDS households that have already suffered adult mortality are likely to suffer from reduced agricultural productivity and possible food insecurity due to shortages of drought power, cattle manure and other animal products.

The practice of dispossession of cattle and other farm assets from grieving widows following death of her spouse is yet another fundamental concern of development practitioners and women rights watchdog groups. This study confirms that the practice of giving away to relatives of the deceased some of the productive farm assets belonging to the surviving widow continues in 20% of rural deaths. This figure represents significant decline compared to 15 years ago when the practice was customary norm in rural and urban communities. Accelerated deaths due to HIV and AIDS are apparently transforming social institutions to safeguard continued viability of female headed single parent families that now occupy a dominant position in rural societies ravaged by HIV and AIDS

g) Assessing the Impacts of HIV and AIDS on Livelihood of Women in Agriculture

The impact of HIV and AIDS on agriculture is said to be doubly negative if it worsens the economic plight of women farming in the rural areas where a majority are already in marginalized and vulnerable position. This matter was examined in a separate chapter. The chapter shows that in Zimbabwe more women are infected with HIV and AIDS than men especially in urban areas. The widowed women in rural areas bear a double burden doubling up as volunteer care-givers for rural people dying of AIDS and as economic provider for her children and orphans from deceased relatives. The rising importance of the single parent household of HIV and AIDS widows in rural areas shall require serious reorientation of national agricultural policies and support services if rural areas are to become once again food basket of a post famine Zimbabwe. Comparison of traditional Male headed households and Widowed Households when both are severely affected by HIV and AIDS show that the farming system of the women headed households are more resilient.

Econometric analysis in which gender interactions are extensively taken into account, shows that gender is indeed an important factor directly or indirectly (i.e. through interactions with other variables) accounting for observed variability in productivity, food security and self sufficiency across households. The important interactions are between gender - land holding, income and productive asset - reflect possible areas for policy attention to safeguard livelihoods of women farmers affected by HIV in agriculture.
8.2 Policy Challenges and Recommendations

The Zimbabwe study of Impact of HIV and AIDS on Agriculture and Food Security Performance of Smallholder Farmers was undertaken in 2003/4 - a year in which the climate was below normal and the domestic macroeconomic environment uncharacteristically unstable. The study was therefore undoubtedly undertaken under the most unfavorable conditions to ascertain impact of HIV and AIDS on Agriculture. The study applied sampling frame which controls for common stress factors to generate robust data set on production, consumption and investment choices of both agricultural households affected by HIV and AIDS versus those deemed relatively unaffected by the pandemic. From the comprehensive analysis undertaken and feedback from stakeholders there are a number of policy challenges arising from the study that need urgent attention from policy planners and/or development practitioners. This section will briefly discuss the policy challenges and articulate for each challenge policy measures informed by insights from the study recommended to government and development practitioners.

Policy Challenge 1: Getting Serious about Mitigating the Impact of HIV and AIDS on Agriculture

The Government of Zimbabwe has long acknowledged the potential adverse impact of HIV and AIDS on agriculture and the national economy. It has however been very slow in taking policy actions to mitigate the impacts of HIV and AIDS on agriculture. The National Aids Council administered through the Health Ministry has been careful to avoid programs that encroach on the turf of other Ministries. The Ministries also have also been too careful to implicitly defer serious policy matters on HIV and AIDS to the National AIDS Council. Thus important matters of planning mitigation programs have been left at the boundary and without effective leadership.

It is recommended that Ministry of Agriculture negotiate with NAC to assume technical leadership in planning policies and programs to mitigate the impact of HIV and AIDS on Agriculture. Given the importance of agriculture in national development and the serious threat that HIV and AIDS poses to the sector, the Agriculture Ministry must get serious about designing HIV and AIDS mitigation strategies for the agricultural sector. Greater collaborative engagement of Ministry of Agriculture and Rural Development and NAC would also help NAC operational division get focused on impacts of HIV & AIDS on agriculture. NAC secretariat is presently not organized for effective coordination and servicing of specific sector-specific HIV and AIDS programs. As the NAC shifts its focus from HIV and AIDS
educational awareness campaigns mitigation programs that are necessarily sector specific, reorganization of NAC for effective service delivery to sub sectors of the economy will become inevitable. Starting the process now would be advisable.

**Policy Challenge 2: Creating a National Data Bank for Monitoring HIV & AIDS Impacts on Agriculture**

One of the major challenges to strategic planning around the issues of impact of HIV and AIDS on agriculture is provision of timely accurate and consistent information for planning purposes. There is need for creation of shared national data bank with capacity and resources to undertake regular surveys for monitoring of trends of key HIV & AIDS stress variables and impact variables essential for trekking impact of HIV and AIDS on agricultural performance. At present there are two institutions conducting comprehensive regular surveys on agriculture - CSO and ZIMVAC. Both surveys are not sufficiently comprehensive in their treatment of HIV and AIDS impact on agriculture. NAC has a Monitoring and Evaluation Division with a mandate to coordinate the monitoring and evaluation of HIV & AIDS and intervention programs. The M&E Division of NAC can conceivably host this communal data bank on impact of HIV and AIDS on agriculture to be managed collectively by participating institutions.

**Policy Challenge 3: Sustaining a Conducive Domestic Market & Policy Environment for Smallholder Farmers Living with AIDS to Thrive from Farming**

For smallholder farmers living with HIV & AIDS in rural areas to thrive from farming, domestic agricultural marketing and pricing policies must stop taxing and start supporting farmers. Zimbabwe's current domestic maize marketing and pricing policies pay maize producers less than 10 percent of landed cost of imports. Cotton farmers who market their crop through liberalized but non-competitive domestic markets are also implicitly taxed. Farmers living with HIV and AIDS already suffer income loss due to the impact of HIV and AIDS on agriculture and cannot afford to receive producer prices that are lower than fair and just import parity prices for the same goods. The implicit transfer of income from maize producers through poor prices has a social cost in terms of worsening the income and consumption possibilities of rural farmers living with HIV and AIDS. Policies that reduce household income and savings also adversely affects ability of household to acquire much needed to self finance acquisition of capital assets for increasing their yields and their food security situation.
In addition to paying farmers competitive prices for their produce, conducive policy environment must also improve farmer access to markets by eliminating market failures. In Zimbabwe, agricultural financial markets are completely missing and inaccessible to rural farmers in general and especially for those families living with HIV & AIDS. Special agricultural finance programs set by government and operated by the Reserve Bank are equally inaccessible to rural farmers and new pupil. Yet access to modest grants of Z$20 million to assist young families living with aids buy productive assets can permanently improve lifetime agricultural production possibilities and food security situation.

**Policy Challenge 4: Enhancing Agricultural Productivity of Smallholder Farmers Living with HIV and AIDS Pandemic**

Smallholder farmers in the rural areas presently achieve maize yields ranging from 500 to 1500 kgs per hectare with the average for less affected being 800kgs per hectare while that of most affected families is modestly lower at only 740kgs per hectare. The major constraint to labor productivity is the low rates of utilization of organic fertilizers, poor choice of varieties and seeding rates. The government should assist all farmers in the rural areas double their yields by exposing farmers to labor saving and low-cost agronomic practices for stimulating yields of maize-based farming system. Higher yielding soil fertility management techniques that Zimbabwean agricultural research community has produced are capable of stimulating yield of maize based farming systems. These include - cereal legume inter-cropping and intra-cropping practices, improved fallows using agro forestry plants. Application of agricultural lime (or other traditional liming materials - manure, leaf litter) to neutralize inherent soil acidity of over-cropped rural farmlands is expected to increase maize yields by as much as 100% from current average rates of application of inorganic fertilizers in communal areas.

With current low producer prices, rural farmers have been applying 2bags of fertilizers per hectare of maize. When producer prices for maize are increased to import parity world price of US$200 (ie Z$9million to Z$18million), smallholder farmers would once again find fertilizer application rates of four to six bags and yields of 1500 to 2500kgs per hectare to be entirely profitable. Unlike in the 1980s when most rural farmers would self finance such investments in fertilizer, today very few farmers would be able to buy such amounts of fertilizer without access to seasonal input loans due in part to HIV and AIDS, unemployment and low remittance capacity of the employed. For families affected by poverty and/or by HIV and AIDS, access to seasonal input credit scheme and access to affordable draft power are essential prerequisite, without which almost all yielding increasing technologies are not feasible. Government of Zimbabwe can therefore no longer afford to continue to take a piecemeal approach to addressing inherent market failures in rural input markets and rural draft power markets.
Policy Challenge 5: Facilitating and Safeguarding Productive Asset Investments of Farmers Living with HIV and AIDS

The diminishing holdings of productive farm assets—including cattle must be an issue of serious policy concern in Zimbabwe. The diminishing trend has been fueled by excessive removals due to financial demands of a prolonged HIV and AIDS illness and household failure to accumulate - before onset of HIV and AIDS illness- adequate asset wealth to meet future demands due to poverty. The national policy of surrendering cost of caring for HIV and AIDS patients to the poor rural families inevitably exerted undue pressure for families to sale productive cattle and farm implements to pay for health and nutrition care during illness. Social institutions have exerted pressure on grieving widows to offer remaining cattle for slaughter to honor the deceased at his funeral. Customary practice of sharing deceased estate with relatives further depletes the family holdings to a bare minimum providing a disincentive for widows-to-be to hold on to cattle during the period of problem morbidity of a spouse. These three institutions have unwittingly left most rural farming areas with depleted cattle holdings and faced with a severe shortage of draft power for land preparation. At a time when HIV and AIDS has rendered infeasible prehistoric hand-powered land preparation long abandoned in favor of draft power, the majority of the rural agricultural population has to rely on the relatively more expensive poorly developed public and private tractor service delivery system for tractor-powered land preparation. The result has been the persistent chronic supply bottleneck limiting cropped area and crop production levels at household and national levels.

The social benefits of effectively addressing the cattle crisis in rural areas are therefore immense in the face of HIV and AIDS. The solution to the challenge is multi-pronged.

(a) Political pressure on traditional leadership to discourage the customary practice of dispossessing the widow (er) of remaining cattle holdings upon death of her (his) spouse. So far the practice has noticeably slowed down due to soft non-coercive strategy of moral suasion. Coercive legislation may be necessary to protect the remainder from the 20% of families still bent on the practice.

(b) Targeted roll out of a comprehensive HIV/AIDS support programs for rural families living with AIDS aimed at providing sufficient resources for care to the rural families so that they do not resort to poverty-worsening measures of consumption of much needed livestock capital base essential for sustaining agricultural production and resilience of rural farmers living with aids.

(c) Expansion of livestock investment support program into rural areas to encourage restocking and commercialization of rural herd. However special program to give a herd -start to young rural families diagnosed to have HIV and AIDS may also be necessary to encourage young families to detect illness
early and start early pyscho-socio and economic counseling (and treatment when available) and on their sustainable livelihood strategy

Policy Challenge 6: Special Policy Attention on HIV/AIDS affected Women Headed Households in Agriculture

The analysis of impact of HIV and AIDS on Women in Agriculture revealed that impacts do not arise from direct relationships between HIV/AIDS, Women and Agriculture. But important impacts come are often indirect through the pervasive interactions of women with social and economic institutions defining their social relationships with man, income realizations, land holdings and security of their assets. Thus bigger policy challenge remains a BIG challenge of addressing gender inequities in all social, economic and political spheres of human interactions.

Without subtracting attention from the BIG agenda, and in light of the disproportionate burden of impact of HIV and AIDS shouldered by women headed households living with AIDS, there is need for special attention on this most vulnerable group in all areas of policy and special programming already discussed. The policy makers and development planners must take cognisance of the fact that this category of rural inhabitants is rapidly growing towards the majority especially in communities severely affected by HIV and AIDS. Public policy institutions especially agricultural extension and technology research may need to reorient their program to focus research and extension programming on crops and technologies of interest to this growing group of farmers.

The female-headed household seems to do more for society while asking less from society. At present community based care (dominated by women) is providing care to the bulk of people living with HIV and AIDS in rural areas contributing to the national government billions of dollars by donating their time and services despite their own vulnerable income situations. The least society can do is to ensure that the care-givers are provided with adequate supplies for effective and safe execution of their duties. Yet community care-givers in the study areas had run out of supplies as basic as disinfectant soap and still continued to offer their care service to the dying and the ill.

Thus NAC must consider revising the formula for allocating AIDS Levy to ensure that community based caregivers are assured of adequate prescribed provisions. Furthermore NAC must assume greater role coordinating non-state actors to ensure equitable distribution of programs and resources on HIV and AIDS across all districts of Zimbabwe. These measures will also ensure that care givers across the districts benefit from interactions with state as well as non-state actors.
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## Appendices

**Table A1. Age of household and Ownership of Physical Assets**

<table>
<thead>
<tr>
<th></th>
<th>Early age households (0-10 years)</th>
<th>Old age households (11 years and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycles</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Radio</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Ox-drawn Plough</td>
<td>36</td>
<td>47</td>
</tr>
<tr>
<td>Wheelbarrow</td>
<td>36</td>
<td>49</td>
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<tr>
<td>Scotch cart</td>
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<td>16</td>
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**Table A2. Age of household and Ownership of Livestock Assets**

<table>
<thead>
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<th>Early age households (0-10 years)</th>
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</thead>
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<tr>
<td>Cattle</td>
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</tr>
<tr>
<td>Goats</td>
<td>34</td>
<td>34</td>
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<td>Poultry</td>
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**Table A3. Adult sickness and mortality and physical asset ownership**

<table>
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<tr>
<th></th>
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<th>Bicycles</th>
<th>Radio</th>
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<th>Wheelbarrow</th>
<th>Scotch cart</th>
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<tr>
<td>With Adult Illness</td>
<td>183</td>
<td>15</td>
<td>26</td>
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<td>13</td>
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<tr>
<td>Without Adult Illness</td>
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<td>6</td>
<td>21</td>
<td>42</td>
<td>46</td>
<td>21</td>
</tr>
<tr>
<td>With Adult mortality</td>
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<td>13</td>
<td>30</td>
<td>47</td>
<td>48</td>
<td>18</td>
</tr>
<tr>
<td>Without Adult mortality</td>
<td>77</td>
<td>7</td>
<td>14</td>
<td>40</td>
<td>46</td>
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**Table A4. Adult sickness and mortality and livestock asset ownership**
### Proportion of households that owned the asset (%)

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<th></th>
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<th>Goats</th>
<th>Donkeys</th>
<th>Poultry</th>
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<td>183</td>
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<td>31</td>
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<td><strong>Without Adult Illness</strong></td>
<td>141</td>
<td>37</td>
<td>36</td>
<td>3</td>
<td>69</td>
</tr>
<tr>
<td><strong>With Adult mortality</strong></td>
<td>247</td>
<td>33</td>
<td>33</td>
<td>2</td>
<td>62</td>
</tr>
<tr>
<td><strong>Without Adult mortality</strong></td>
<td>77</td>
<td>35</td>
<td>34</td>
<td>1</td>
<td>70</td>
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**Table A5. Adult sickness and mortality and physical asset transactions**

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<th></th>
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<th>Wheel barrow</th>
<th>Hoes</th>
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<td>0.5</td>
<td>0</td>
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<tr>
<td>% that sold at least 1</td>
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<td>0.5</td>
<td>1.1</td>
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<tr>
<td>Without adult illness (n=141)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>% that bought at least 1</td>
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<td>0</td>
<td>0.7</td>
<td>0.7</td>
<td>0</td>
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<tr>
<td>% that sold at least 1</td>
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<td>0</td>
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<tr>
<td>With adult mortality (n=247)</td>
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<td>% that sold at least 1</td>
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<td>Without adult mortality (n=77)</td>
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<td>1.3</td>
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<tr>
<td>% that bought at least 1</td>
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**Table A6. Distribution of caregivers by province, ward and sex. ZRCS, 2005**

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of male caregivers</th>
<th>Number of female caregivers</th>
<th>Total</th>
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<tbody>
<tr>
<td><strong>Manicaland</strong></td>
<td>70</td>
<td>90</td>
<td>160</td>
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<tr>
<td>Buhera</td>
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<td>Chipinge</td>
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<td>22</td>
<td></td>
</tr>
<tr>
<td>Marange</td>
<td>16</td>
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<tr>
<td><strong>Mashonaland east</strong></td>
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<td>54</td>
<td>58</td>
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<td>Marondera</td>
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<tr>
<td>Murehwa</td>
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<td>25</td>
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<td>Province</td>
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<td>Maledi</td>
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<td>Lower Gweru</td>
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<td>Matabeleland North</td>
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<td>Dete</td>
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<td>Victoria falls</td>
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<td>Masvingo</td>
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<tr>
<td>Chivi</td>
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</tr>
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<td>Mwenezi</td>
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<td>TOTAL</td>
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<td>Percentage</td>
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<td>84%</td>
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