

## **SECTION TWO:**

**Research experience and action to combat  
HIV/AIDS impact on agriculture**

## **Empirical assessment of the impact of HIV/AIDS on agricultural performance and food security of rural families**

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### ***Abstract***

*In the pre-HIV/AIDS era, smallholder-peasant agricultural households were already complex and multi-dimensional economizing units. Their relationship with urban industries was largely positive. With the emergence of HIV/AIDS, the impact of the disease on agricultural production and food security prospects of rural households is necessarily complex and very difficult to ascertain. 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 study uses a modified household framework that includes different social dimensions that affect livelihoods of rural households. Descriptive analysis is used to assess empirically the extent to which HIV/AIDS has affected rural agriculture and food security. Regression analysis helped to ascertain the relative significance of HIV/AIDS in explaining observed differences in key impact variables, such as productivity and food security status, between different households. Initial results indicated that HIV/AIDS impact on key variables such as productivity and food security appeared to be somewhat contradictory and at best ambiguous – especially given the confounding impacts of adult mortality and macro policy environment. Further analysis showed that though HIV/AIDS does not seem to be important in explaining observed differences in productivity, it is very significant when it comes to food security. The study concludes that the presence of other factors also influencing key impact variables raises many questions about the extent to which some of the observed changes in smallholder agriculture should be attributed to HIV/AIDS alone. 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.*

**Key words:** *HIV/AIDS, agriculture, food security, productivity*

### **Introduction**

Before the HIV/AIDS pandemic, smallholder-peasant agricultural populations in Zimbabwe and Southern Africa in general were already poor but efficiently economizing agents. Faced with daunting livelihood challenges of poverty, diminishing agricultural productivity and threat of food insecurity, peasant households survived through complex but profitable institutional and economic innovations often linking the rural economies to the urban formal economy through wage employment and trading of agricultural produce.

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 the rural household economy was largely positive with a flow of remittances from urban employment to rural households.

With the emergence of HIV/AIDS, there is now a possibility of erosion of those positive remittances that rural households were receiving from urban industries, and a possible transfer of sickness and its impacts to rural livelihoods. Despite this assumed negative impact possibility, the impact of HIV/AIDS 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. If rural households were able to invest pre-HIV/AIDS urban earnings into assets such as livestock holdings then the disposal of such assets due to HIV/AIDS does not necessarily leave the households worse off. Hence the 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 suggests 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?

## **Background**

In 2001, sub-Saharan Africa alone accounted for more than 70% (24 million) of the global population infected with HIV/AIDS, and about 9% of the adult population and more than one million children in the sub-region were estimated to be infected with HIV/AIDS (UNAIDS, 2000).

Zimbabwe has been severely affected by the disease. It faces a sharp rise in the number of pregnant women with HIV/AIDS, estimated at 50%, while its neighbors Botswana, Namibia and Zambia have rates ranging between 20% and 40%. Zimbabwe's life expectancy for the current generation of teenagers has fallen from 60 years to 39 years over the past 15 years. South Africa's life expectancy will fall from 65 years to 40 years by the year 2008 due to the impact of AIDS. In Zambia, the cumulative number of AIDS related cases rose rapidly after the initial identification of an AIDS case in 1984. By 1997, the number had risen to 1.02 million people consisting of 950,000 adults and 70,000 children infected with HIV. The high prevalence rates come at a time when Zimbabwe is in the midst of a humanitarian crisis with food security at its heart. Observers have implicated several underlying and overlapping factors in exacerbating the impact of the climatic stresses on the food crisis – including deep and widespread poverty, insecurity surrounding land, removal of price controls, resource degradation and erosion of agricultural diversity, poor governance and HIV/AIDS. The impact of the HIV/AIDS epidemic on national development, household and individual economies has compounded challenges surrounding development, poverty and inequality. As Louwenson and Whiteside (2001) contend:

"The devastation caused by HIV/AIDS is unique because it is depriving families, communities and entire nations of their young and most productive people. The epidemic is deepening poverty, reversing human development achievements, worsening gender inequalities, eroding the ability of governments to maintain essential services, reducing labor productivity and supply, and putting a brake on economic growth. The worsening conditions in turn make people and households even more at risk of, or vulnerable to, the epidemic, and sabotages global and national efforts to improve access to treatment and care. This cycle must be broken to ensure a sustainable solution to the HIV/AIDS crisis".

There is mounting evidence and recognition that the spread of HIV/AIDS has increased the sensitivity of agrarian society to socio-economic shocks such that small shocks can precipitate crises for huge sections of the population in rural and poor resourced areas. The prime age adult mortality prevalent in most African rural societies has been found to affect rural agricultural systems such that the death of a male and/or female household head leads to losses in crop diversification and net value in household crop production (Yamano and Jayne, 2002). Negin (2004) further asserts that HIV/AIDS is destroying sustainability of rural agriculture and livelihoods and that, if the trend continues, it is going to create a poverty trap for developing countries in sub-Saharan Africa. It has been suggested that the effects of HIV/AIDS on agriculture are complex and require urgent and innovative responses in both the short- and long-run.

Although intensifying responses to the epidemic have focused on prevention and care, these have tended to ignore the broader picture of the pandemic's implications for development and poverty reduction (Collins and Rau, 2000; Louwenson and Whiteside, 2001). Discussions amongst development practitioners and policymakers have therefore been limited, and a number of policies and goals, including the United Nations Millennium Declaration Goals, have failed to take into account the added challenges resulting from sharp increases in AIDS-related mortality rates.

## Methodology

### Conceptual framework

The microeconomic impact of HIV and AIDS on production and food security performance of agricultural populations is best explored using a household-cum-livelihood framework. A simple household framework (Singh *et al.*, 1986) is a flexible framework, which is capable of incorporating a variety of impact pathways as long as they can be translated into measurable changes in economic costs and/or benefits streams of the household economy. For this study a generic economic definition of household was adopted.<sup>1</sup>

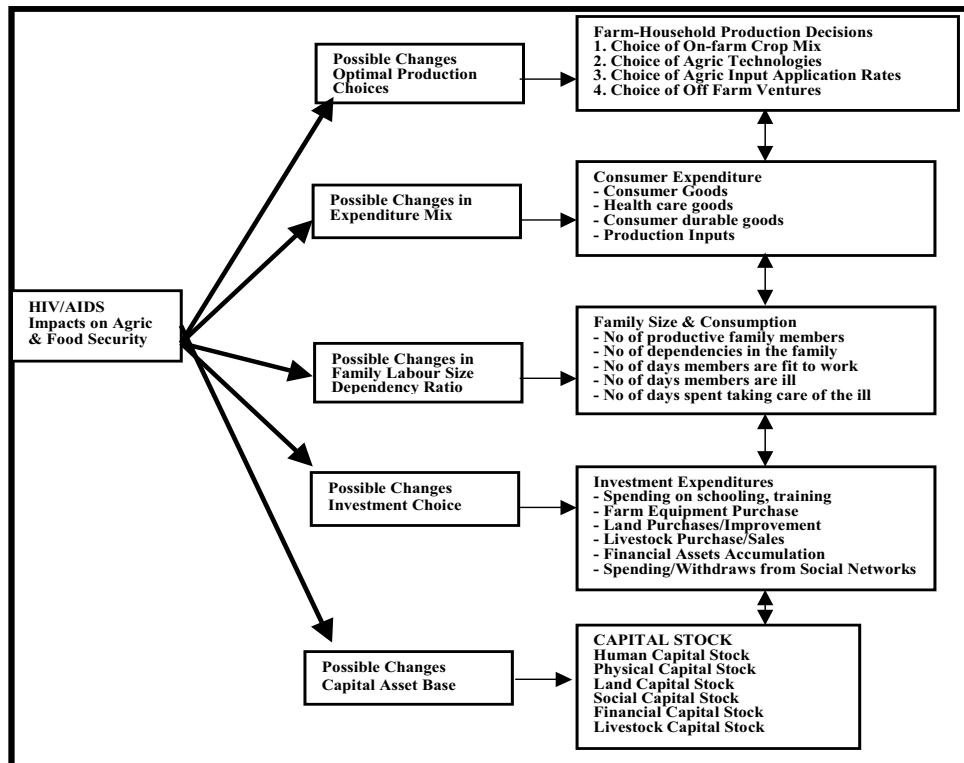
However, some of the impact areas especially in terms of salient change in societal attitudes and new forms of unwritten but widespread discriminatory applications of social rules and regulations in commercial and non-commercial engagements cannot be fully and comprehensively explored under a household framework. The livelihoods approach offers explicit attention to both economic aspects as well as the institutional aspects of rules and regulatory environment affecting the livelihood options and livelihood outcomes. A number of sociological case studies have yielded a wealth of hypotheses on potential economic implications of institutional and economic impacts of HIV and AIDS on livelihoods. Mutangadura *et al.* (1999) cite 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. Nations attending a Southern African Regional Policy Network conference in Mozambique in 2003 agreed that HIV/AIDS was disproportionately affecting the agricultural sector and developing into a serious problem that is already affecting the agricultural productivity, nutrition and food security of rural households (Munn and Bradley, 2003). However, economic exploration of some of these rich narratives has often been limited by narrow conceptual framework.

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<sup>1</sup>Singh *et al.* (1986) define a simple household as a functional decision making unit recognized by the community and consisting of a limited family members making production, consumption and investment decisions together on a regular basis]. Note that the afrocentric definition of household as an extended family is a useful concept but is perceived herein as a multi-household concept bounded by a co-operative social pact.

The FANRPAN Impact of HIV/AIDS on Agriculture Research integrates the institutional aspects of the livelihoods framework into the household optimization framework to yield a richer conceptual framework for analyzing observed impact of HIV/AIDS on agriculture and food security of rural families. By combining comparative econometric analysis with mathematical programming approaches, the FANRPAN HIV/AIDS Impact on Agriculture Studies has build a methodological approach which brings the social science disciplines of economics, development anthropology and rural sociology closer together than ever before in assessing impact of HIV/AIDS on agriculture and livelihoods. Social rules of dispossession of assets are cited in a number of case studies such as in Mutangadura *et al.*, (1999) and Rao Gupta (2000); for example, leaving HIV/AIDS widows doubly poor is a societal institution that is best understood when translated into transactions costs affecting incentives and disincentives to invest or disinvest in assets before, during incidence of life-threatening HIV and AIDS illness and after the death of a family head. The following graphical illustration shows the various pathways in which HIV and AIDS may affect agricultural choices of typical African agricultural households.

Figure 4. Impact of HIV/AIDS on agricultural households



The conceptual framework shows five possible pathways through which HIV/AIDS can have economic impacts on household agriculture and livelihood. The HIV and AIDS pandemic has a dynamic impact on:

- (a) **Family demography and labor holdings:** through HIV/AIDS-related sickness and deaths the pandemic has the potential to affect rural family structures, increase dependency ratios and reduce family labor by diverting available labor to caring for the sick and or removing the sick person's labor contribution.
- (b) **Off-farm employment opportunities and earning potential:** time taken to care for the sick could reduce the time to be active in off-farm employment thus reducing a household's potential to earn more income. If the sick were contributing positively to the rural household's income through remittances, then there is a possibility of lost income due to the redundancy of those who fall ill.
- (c) **On farm production choices and performance:** there is a possibility that rural households' input use is affected by the presence of HIV/AIDS. Income could be diverted from productive uses on the farm to caring for the sick. The effects of HIV/AIDS on management performance of the farmer could result in the use of unsustainable technologies on the farm and a change in crop mixes.
- (d) **Consumption choices and expenditure patterns:** there is bound to be a change in consumption choices and expenditure patterns in the presence of HIV/AIDS. HIV/AIDS could induce a trade off between expenditure on production inputs and durable goods and expenditure on health care goods.
- (e) **Asset holdings and investment behavior:** HIV/AIDS can impact on a household's capacity to invest in education, farming, asset, financial holdings, etc. This could affect household capital stocks.

The five possible changes in rural livelihoods due to HIV/AIDS presented in the above framework need to be explored if research is to come up with tangible results that can help shape HIV/AIDS policy in developing countries.

### **Data requirements and design of primary survey**

A baseline, cross-sectional, single-period survey was carried out in two provinces of Zimbabwe. A total of 350 agricultural families were interviewed in Goromonzi District of Mashonaland East Province and in Makoni District of Manicaland Province. The sampling frame was stratified to target the 'affected population and the population of the

‘less affected’. The study adopted the classification system used by the Community-based Care-givers (CBC) who are affiliated to the National AIDS Council and hence the Ministry of Health and Child Welfare. The CBC classification identifies ‘affected’ families based on a combination of clinical diagnosis of families caring for HIV/AIDS patients and social judgments of severity of HIV/AIDS impact on livelihood of the affected families in terms of the relative ability of family to cope with the burden of HIV/AIDS.

Affected families were thus taken to be those that CBC had identified and were working with in their community programs; 50% percent of the sample size was drawn from the CBC records of the affected populations. The remainder of the target sample was purposively drawn from the remainder of the villagers not identified as being affected in the CBC records. Though the survey aimed at a 50:50 ratio of ‘affected’ and ‘less affected’ families, HIV and AIDS-affected households accounted for 57% of the final sample.

### **Analytical tools**

*Descriptive analysis:* this initial descriptive analysis was done to assess if the CBC targeting system was effective and efficient, and thus ascertain whether it can be taken as a true indicator of the impact of HIV/AIDS on rural households. The CBC social classification of families into ‘affected’ and ‘less affected’ was subjected to diagnostic validation using information obtained through the survey on HIV-related sickness, presence of orphans and mortality. The computed weighted index of sickness, number of orphans and deaths were used in quantitative analysis as monotonic measures of severity of HIV/AIDS among agricultural households.

*Comparative statistical analysis:* this approach was used to compare agricultural practices and production performances of HIV/AIDS-affected and lesser-affected populations. The approach 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.

*Econometric analysis:* this analysis was done to find out if HIV/AIDS status and intensity of affliction is important to explain observed variation in two important impact variables such as productivity and food security. Multiple regression analysis was used to test the assumed hypothesis in this section.

*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

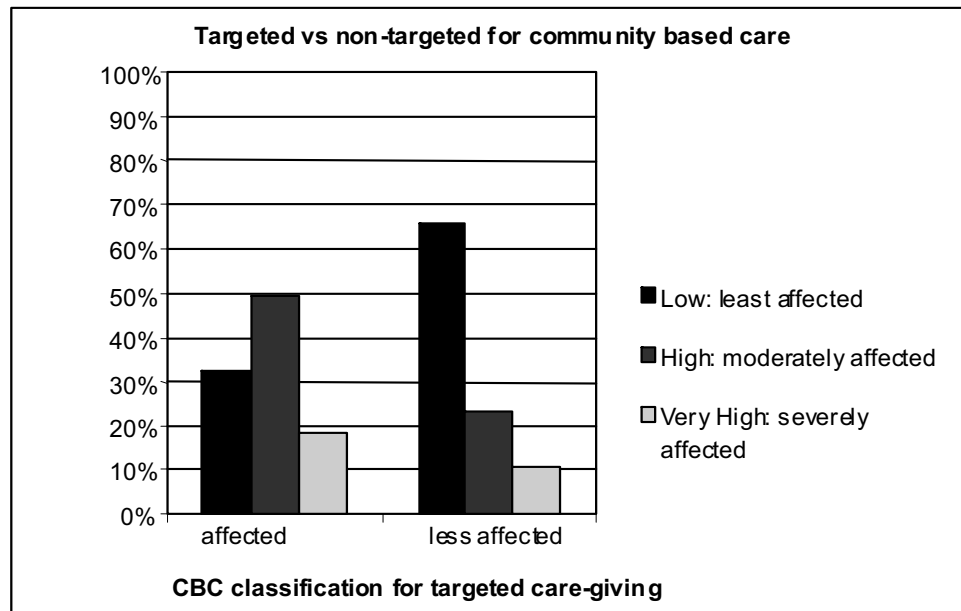
In this paper multivariate regression models were created for the two impact variables, i.e. productivity and food security. Explanatory factors considered in the analysis for each impact variable are given in Annex 1.

## Results and discussion of descriptive analysis

### *Severity of affliction and community-based targeting*

A scientific categorization of families based on their weighted index of sickness (WIS) from HIV/AIDS related illnesses resulted in Fig 5, which shows that the Community-based Care-givers (CBC) classification and targeting system only reaches out to a subset of the severely- and highly-afflicted rural families.

**Figure 5.** 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 care-givers normally target. This means that the use of the household status, i.e. CBC classification in econometric analysis, will not be effective and efficient. Thus the study would also use researcher-computed indicators of severity of HIV/AIDS, i.e. weighted index of sick persons, number of orphans and deaths, as HIV/AIDS related variables in the analysis.

### **Results and discussions of comparative statistical analysis**

Comparative statistics for most of the possible changes that could occur as a result of the impact of HIV/AIDS are presented in Table 10. Households are categorized according to the CBC classification system, with indicators of severity of HIV/AIDS also included in the analysis as characteristic variables of the households. Results show that the presence of sickness and deaths in a given household significantly determines whether a household is deemed affected or not. There is no significant difference between affected and less-affected households as far as orphans are concerned. Orphans are present in both types of households, i.e. each type of household has an average of two orphans. Further discussion of these results is carried out in the following sections.

**Table 10.** Comparative statistics for affected versus less-affected households

Characterization	Affected (N=186)	Less-affected (N=141)	T test/ Chi-square value
<b>Family HIV/AIDS status</b>			
Weighted Index of Sickness	4 (3)	2 (3)	5.1***
Orphans	1.6 (2.2)	1.8 (2.1)	0.3
HIV/AIDS-related deaths	1.9 (1.2)	1.5 (1.2)	3.4***
<b>Mortality and family structure</b>			
Family size	5.8 (2.3)	5.4 (2)	1.9*
Dependency ratio	0.6	0.65	-2.1**
Education level ( <i>Primary educated</i> )	74%	76%	0.14
Female-headed households	64%	66%	0.14
Child-headed households	4.3%	1.6%	4.2
<b>Off farm employment issues</b>			
% Wage employed	45%	49%	0.35
Wage income (p.c. Z\$/annum)	11500 (1580)	11600 (2300)	0.71
<b>Agricultural production choices</b>			
Number of crops grown	1.6 (1)	1.5 (0.9)	0.71
Maize acreage	1.5 (1)	1.6 (1)	-0.21
Paprika acreage	0.3 (0.2)	0.2 (1)	0.7
Nitrogen use (kg/ha)	136 (113)	131 (101)	0.4
Seed (kg/ha)	23 (14)	22 (13)	0.6
<b>Agricultural performance</b>			
Maize yield (kg/ha)	583 (512)	570 (465)	0.75
Paprika yield (kg/ha)	455 (241)	488 (550)	0.08
Food secure	57%	61%	0.73
Income from crop sale (Z\$)	131000	134000	0.9
<b>Asset endowments</b>			
Cattle ownership	1 (1.7)	1.45 (2.5)	-2.065**
Asset index	21 (10)	22 (16)	-0.82
Land cultivated (acres)	2 (1.6)	2 (1.5)	0.15
<b>Expenditure and Investment</b>			
% Expenditure on food per month	61%	65%	-1.2
p.c. expenditure on food (Z\$)	19500	21000	0.43
p.c. expenditure on health (Z\$)	235000	196000	0.14
% Expenditure on health per annum	19	13	2.6**
% Investment in farming per annum	1.1	1.5	-1.03
% Investment in education	8	9	-0.9

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

NB: figures in brackets are standard deviations

***Impact on family demography and labor holdings***

There is a slightly significant difference in family size between affected and less-affected households. Affected families have a relatively larger family size compared to less-affected families that may be due to the presence of more orphans in such families. This is also reflected when considering dependency ratios. There is a significant difference in dependence ratios between the two types of households. Affected households have a smaller dependency ratio compared to less-affected populations. On the surface this implies that less-affected households take care of more orphans compared to affected households. There is also a marginal but insignificant difference between the two types of households as far as their level of education and household head are concerned (Table 10).

Further analysis showed that higher than normal mortality rates were observed among young parents, resulting in the transformation of rural families into single or zero parent households (Fig A1). Over 50% of the rural families surveyed have lost one or both parents. Most of the parents died between the ages of 26 to 38 years – leaving the burden of farming, feeding and educating kids, and parenting very young children to a single (often ailing) parent. This is evident in the family structures existing in these rural communities. The parent mortality ratio is slightly less for affected families targeted by CBC, indicating presence of HIV/AIDS illness in that family. Widowed, female-headed (51% and 48% in less-affected and affected households respectively) 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 account for just 7%. One in every 33 families surveyed (3%) is child-headed and remains a special social concern in the rural communities (Fig A2).

***Impact on off farm employment opportunities and earning potential***

HIV/AIDS does not seem to be significantly affecting household employment opportunities and earning potential (Table 10). Though a greater number of less-affected populations are involved in wage employment and there is no major difference in per capita wage income. Generally, there is evidence of chronic poverty in these rural areas with very low wage income per capita figures of less than US\$2. The results also indicate that more than 50% of households in rural areas greatly depend on agriculture as a source of livelihood and would be adversely affected by HIV/AIDS if its impact on agriculture proves to be significant in one way or the other.

***Impact on farm production choices and agricultural performance***

HIV/AIDS affects production choices such as cropped area, number and type of crops grown, area allocated to each crop and inputs applied to each enterprise. There is a ten-

gency of HIV/AIDS-affected households to grow fewer labor-intensive food crops compared to cash crops. Crop diversification may be reduced in the presence of HIV/AIDS because of the household's incapacity to cultivate larger pieces of land, labor morbidity and the monocultural tendencies of such households. Diversion of household financial resources from productive activities to more consumptive expenditures such as health care may reduce input application rates for affected households. Through all these effects, HIV/AIDS will impact negatively on household agricultural performance and food security status. Two common crops, i.e. maize and paprika, are considered for analysis in this section.

#### ***Impact on optimal production choices***

Results in Table 10 show that there is discernible but insignificant difference between affected and less-affected families as far as their cropped area, crop diversification, areas allocated to maize and paprika, and fertilizer use are concerned. Other results (Fig A3) indicate pronounced impacts of HIV/AIDS on household farming system especially maize area when it has already resulted in adult mortality. The presence of HIV/AIDS-related deaths in families, regardless of their status, i.e. whether they are affected or not, greatly reduce area 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 have suffered adult mortality.

There is less crop diversification in the study areas. Generally, approximately 50% of farmers in the survey regardless of their status grow only one major crop, i.e. maize, while only 20% of the farmers grow three crops and above. Though there is less crop diversification in the study area, male-headed households are more crop-diversified than female-headed households with a greater percentage of male-headed households growing at least three crops compared to their female counterparts. Fertilizer use is almost the same across HIV/AIDS-affected (136 kg/ha) and less-affected households (131 kg/ha).

#### ***Impact on agricultural production performances and food security realizations***

Extended interruption of the labor 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 families, constraints production and the attainment of food security.

##### ***(i) Impact on yields realization***

There is insignificant difference in maize and paprika yields between affected and less-affected households though the average yields of maize are marginally higher for HIV/

AIDS-affected farmers (583 kg/ha) than for less-affected farmers (570 kg/ha) (Table 10). But HIV/AIDS has greater implications on the maize yield realization of affected female-headed households. Only 52% percent of HIV/AIDS-affected, female-headed households are realizing above-sample-average maize yields compared to less-affected, female-headed households (57%). Healthier rural families appear to enjoy superior yields on such cash crops as paprika. Given that the price for tradable maize is much lower than for cash crops relative to the border parity prices, lower maize prices in the 2003-2004 seasons affected livelihoods of the afflicted families more than the healthier rural families. In essence, government pricing policies are heavily taxing afflicted families more compared to healthier families, thereby exacerbating poverty in these communities.

Characterization of farmers into high and low maize performers given in Table 11 provided the basis for assessing whether HIV/AIDS-related indicators are directly affecting relative productivity of different households in the study. HIV/AIDS status does not seem to be directly affecting productivity between high and low performing households. Instead the results show that significant difference between high and low performers is through asset, area cropped, yield-related factors of input application rates, and crop diversity. Thus, if HIV and AIDS were indirectly affecting productivity, it would have to do so through its impact on assets endowments, access to inputs and ability to crop a larger area with diverse crops. We need to explore these hypotheses if a greater understanding of the impact of HIV/AIDS on productivity is to be attained.

*(ii) Impact on food security*

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 so as to access and afford food. Table 10 shows that there is insignificant difference in food security between HIV/AIDS-affected and less-affected households. Generally more than 50% of households in all categories of affliction are food secure though the less-affected families are generally more food secure compared to the affected households.

**Table 11.** Characterization of farmers into high and low maize performers

<b>Characterization</b>	<b>High Performers (Top 33% N=108)</b>	<b>Low Performers (Bottom 33% N=110)</b>	<b>T test/ Chi-square</b>
<b>Off-farm employment issues</b>			
% Wage employed	41%	54%	3.9**
Wage income	45000 (106000)	54000 (107000)	0.77
<b>Family HIV/AIDS status</b>			
Affected vs not affected	55%	59%	0.44
Weighted Index of sickness	3.1 (3.3)	3 (3.3)	-0.12
Orphans	1.6 (2.2)	1.9 (2.2)	1.1
<b>Household Demographics</b>			
Family size	6 (2)	6 (2.3)	0.27
Primary education	75%	75%	0.005
Female Headed	64%	66%	0.3
<b>Household Endowments</b>			
Cattle ownership	1.2 (1.8)	1 (2.4)	-1.1
Asset index	23 (12)	19 (14)	-2.6***
Land cultivated (acres)	2.3 (1.6)	1.9 (1.5)	2.04**
<b>Cropping system</b>			
Maize yield	1252 (389)	221 (143)	-26.0***
Nitrogen use (AN kg/ha)	184 (103)	88 (103)	-5.6***
Seed (kg/ha)	26 (15)	18 (10)	-4.9***
Number of Crops	2 (1)	1 (1)	6.2***

\*\*significant at 5%, \*\*\*significant at 1%

NB: figures in brackets are standard deviations

Characterization of families in terms of their food security (Table 12) gave the basis for evaluating whether HIV/AIDS is directly affecting food security in rural populations. Although 60% of food insecure families are classified as HIV/AIDS-affected households, HIV/AIDS is not significantly having a direct effect on food security in these families. As observed with productivity, results similarly indicate that if HIV and AIDS were indirectly affecting productivity it would have to do so through its impact on family structure, assets endowments, access to inputs and ability to crop a larger area with diverse crops. This is so because results show that significant difference between food secure and insecure is through family structure, assets, acreage cropped, yield related factors of input application rates, and crop diversity.

**Table 12.** Characterization of farmers into food secure and insecure households

<b>Characterization</b>	<b>Food secure (Top 33% N=123)</b>	<b>Food insecure (Bottom 33% N=95)</b>	<b>T test/ Chi-square value</b>
<b>Off-farm employment issues</b>			
% Wage employed	58%	44%	4.1**
Wage income	60000 (114000)	41000 (100000)	0.3
<b>Family HIV/AIDS status</b>			
Affected vs not affected	55%	60%	0.48
Weighted Index of Sickness	3.1 (3.3)	3 (3.3)	-0.12
Orphans	1.6 (2.2)	2 (2.2)	1.1
<b>Household demographics</b>			
Family size	5 (2)	6 (2)	3.04***
Primary education	71%	74%	0.23
Female-headed	39%	36%	0.24
<b>Household endowments</b>			
Cattle ownership	2.5 (1.6)	0.7 (1.6)	-2.2**
Asset index	23 (14)	18 (10)	-3.3***
Land cultivated (acres)	2.5(1.6)	1.6 (1.3)	-4.5***
<b>Cropping system</b>			
Maize yield	1060 (521)	296 (350)	-12***
Nitrogen use (AN kg/ha)	157 ( 100)	114 (125)	-2.6***
Seed (kg/ha)	26 (14)	19 (12)	-4.9***
Number of Crops	2 (1)	1 (1)	-3.0***

\*\*significant at 5%, \*\*\*significant at 1%

NB: figures in brackets are standard deviations

### ***Impact on consumption choices and expenditure patterns***

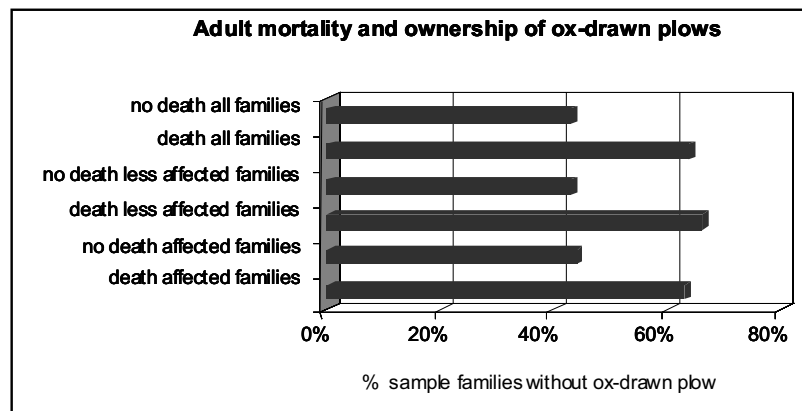
HIV/AIDS is expected to induce some changes in a household's expenditure patterns. Results from the survey show that there is significant difference in expenditure on health between affected and less-affected families although the per capita expenditure is not significant. HIV/AIDS-affected families are spending approximately 5% more of their total income on health care compared to less-affected (Table 10). Generally, both categories of household expend more on food compared to other expenditure activities but healthier rural families spend more on food. This shows endemic poverty in both healthier and HIV/AIDS-affected households, with more than 50% income being spent on food.

***Impact on asset holdings and investment behavior***

Family capacity to hold agricultural assets can be reduced in the presence of HIV/AIDS. Frequent slaughter of cattle for funerals or sale of livestock by the immune compromised individuals to raise money for medical and other expenses reduces assets. The dispossession of assets through customary inheritance laws after the death of an adult further worsens the situation.

Results from Table 10 indicate a significant difference in cattle ownership between affected and less-affected households although this is not so with other family assets and land put under cultivation. Affected households own less cattle compared to less-affected households. Further analysis showed that higher proportions of families that have already suffered adult mortality end up losing essential farm assets, e.g. the ox-drawn plow—regardless of HIV/AIDS status. Changes in traditional cultural values, from societies that used to care for orphans in their communities to societies that are now largely turning a blind eye to this segment, has resulted in loss of essential farm assets (Fig 6).

**Figure 6.** Households without ox-drawn plows



The asset situation of female-headed households is worse compared with that of male-headed households. A greater percentage of female-headed households (60%) end up losing essential assets such as land and ox-drawn plows regardless of their HIV/AIDS status. Generally, very few women have rights to important resources on the farm and in most cases their land and other assets are disposed off after the death of their spouse. This loss of farm assets and the incapacity of rural families to acquire new assets have far-reaching implications for the sustainable livelihood of rural families.

There seems to be a trade off between consumption and investment activities of rural families. Table 10 shows that a lesser proportion of income is invested compared to that which is consumed. Though not significant, HIV/AIDS-affected households invest more in farming and education.

A finer grouping of households in terms of the gender of the household head and HIV/AIDS status resulted in Fig. A5 in Annex 2. Results show that HIV/AIDS affects income invested in farming by female-headed households. HIV/AIDS-affected female-headed households invest a smaller 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.

## **Results and discussions of econometric analysis**

### ***Motivation and hypothesis***

Initial analysis has shown that indicators of the severity of HIV/AIDS in rural households, i.e. the presence of HIV/AIDS-related sickness, deaths and orphans, are not directly affecting either productivity or food security. Thus, if the pandemic is having an impact on these key impact variables then it is doing so through its effects on other socio-economic variables such as production choices, demographic changes, expenditure and investment patterns.

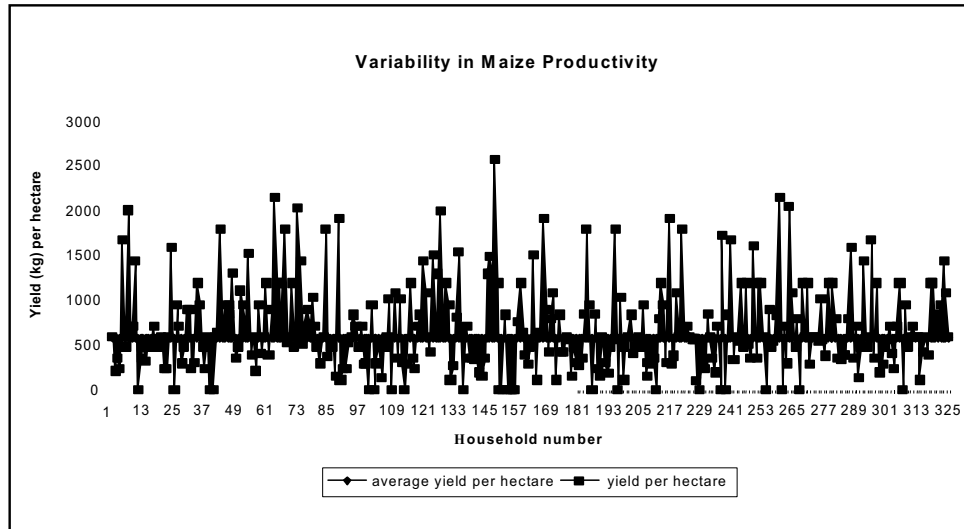
Productivity and food security are affected by a multitude of factors, which together with family health situation affect their variability. It is important to find out whether:

- HIV/AIDS related variables are significant structural and behavioral variables in explaining the observed variability in performance of households?
- HIV/AIDS status of the household is significant in explaining variability in food security among different households?

### ***Productivity***

Productivity is given as returns to land put under crop production. There is greater variability in maize yields across households (Fig 7). 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.

**Figure 7.** Variability in productivity across households



Due to a better level of significance and a higher explanatory power, the linear function in Table 13 will be used in this discussion. Results indicate that although HIV/AIDS-related variables, i.e. the weighted index of sickness and the status of the household, or whether a household is deemed affected or not, are negatively affecting productivity, they are still not significant factors in explaining observed variation in maize productivity across households. Among those that emerge as significant in explaining differences in productivity across households is education of the household head, input application rates, crop diversification and the social networks to which a household belongs.

**Table 13.** Productivity regression model

<b>Dependent variable</b>	<b>Linear (OLS) Maize yield</b>	<b>Semilog Log maize yield</b>
(Constant)	39.5 (0.22)	4.7 (7.45***)
Region	0.06 (1.03)	-0.11(-0.82)
Gender	-0.04 (-0.74)	-0.01(-0.1)
Level of education	.088 (1.7*)	0.04 (0.41)
Number of cattle owned	0.02 (0.37)	0.06 (0.59)
<b>Weighted index of sickness</b>	<b>-0.07 (-1.24)</b>	<b>-0.03 (-0.27)</b>
<b>HIV/AIDS status of household</b>	<b>0.1 (-0.008)</b>	<b>-0.013 (-0.12)</b>
Maize seed/ha	0.21 (3.7***)	0.24 (2.26**)
N/ha of maize	0.24 (4.3***)	0.22 (216**)
Number of crops grown	0.21 (-3.9***)	0.25 (2.36**)
Family labor	0.05 (0.89)	0.16 (1.5)
Social club	0.16 (2.99**)	0.17 (1.61)
Type of land	0.01 (0.2)	0.19 (1.53)
<b>R</b>	<b>0.50</b>	<b>0.55</b>
<b>R Square</b>	<b>0.25</b>	<b>0.30</b>
<b>Adjusted R Squared</b>	<b>0.22</b>	<b>0.20</b>
<b>Durbin Watson</b>	<b>1.86</b>	<b>2.4</b>

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

NB: in brackets are t values

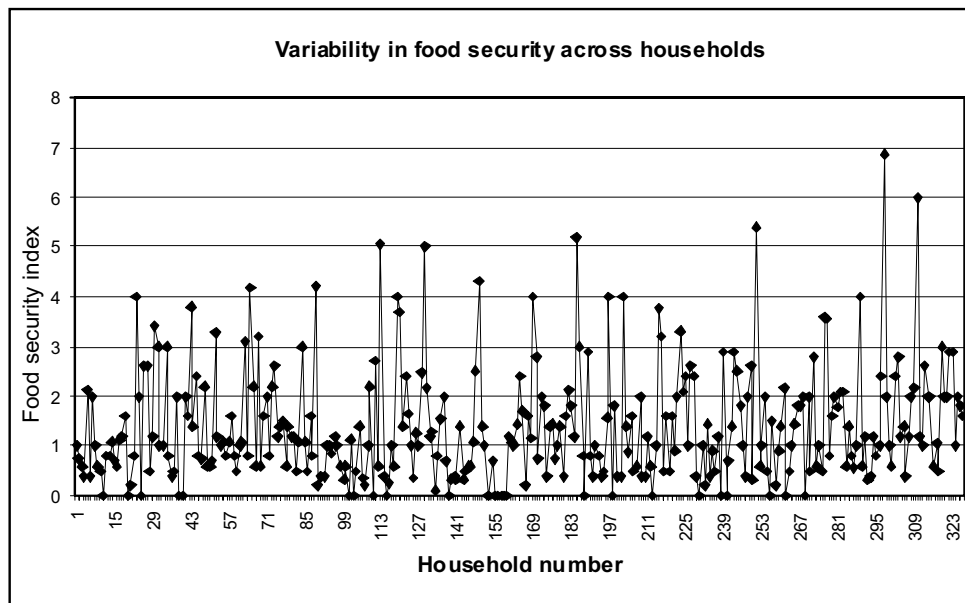
Household head level of education affects management practices put on the farm. Productivity increases the more educated is the household head. Input application rates, such as seed planted and nitrogen applied per hectare, affects efficiency in production. Higher input application rates are expected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

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 agriculture-related social clubs such as community projects, marketing clubs, etc are expected to have higher maize productivity. 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.

### ***Food security***

Rural farming communities are characterized by large variations in food security status in any given year (Fig 8). In the model, food security was measured in terms of intake of cereals as a ratio of total cereal requirements. Due to a better explanatory power compared to the other functions, the translog function in Table 14 will be considered in this discussion.

**Figure 8.** Variability in food security across households



HIV/AIDS is a significant factor in explaining variations in food security across households. Weighted Index of sickness emerged as one of the significant explanatory variables in the model. Increase in the number of the sick in a family resembles worsening impact of HIV-related sickness on the availability of family labor and therefore on 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, thereby diverting funds that could have been otherwise used to buy more food and/or acquire inputs to use in production. This culminates in reduced food security.

**Table 14.** Food security regression model

	<b>OLS</b>	<b>Translog</b>
<b>Dependent variable</b>	<b>Food security</b>	<b>Log food security</b>
(Constant)	-0.4(-1.14)	-8.7 (-1.2)
Region variable	0.01(0.21)	-0.1 (-.852)
Asset/wealth index	0.17 (1.54)	0.62 (2.4**)
Total nitrogen	0.16 (3.47***)	0.08 (0.56)
Cultivated land	0.24 (5.19***)	0.460 (3.5**)
Maize yield/ha	0.45(9.53***)	0.53 (3.7***)
Education	0.031 (0.74)	0.15 (1.3)
<b>Weighted index of the sick</b>	<b>-0.03 (0.75)</b>	<b>-0.36 (2.4**)</b>
<b>Number of orphans</b>	<b>0.4 (0.85)</b>	<b>0.04 (0.3)</b>
Family labor	0.05 (1.1)	0.16 (1.3)
Gender	-0.02 (0.55)	0.29 (2.1**)
Number of crops grown	0.04 (0.71)	0.15 (0.94)
Number of cattle	0.02 (0.20)	0.5 (2.0*)
<b>R</b>	<b>0.68</b>	<b>0.81</b>
<b>R Square</b>	<b>0.46</b>	<b>0.66</b>
<b>Adjusted R Squared</b>	<b>0.44</b>	<b>0.50</b>
<b>Durbin Watson</b>	<b>1.8</b>	<b>2.01</b>

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

NB: figures in brackets are *t* values

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 an 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. Other variables that are significantly explaining variations in food security across households include wealth status (asset index), cultivated land, maize productivity, gender of household head and cattle ownership.

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 can 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 care of the children. This increases the chances of male heads being able to secure employment elsewhere away from home where there are increased opportunities of earning higher wages.

## Conclusions

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 factors other than HIV/AIDS effects that are considered by the community when targeting. This idea needs further exploration.

HIV/AIDS has resulted in an increased number of orphans in populations deemed less HIV/AIDS-affected, and in most rural communities it has left a trail of single-parent-and/or child-headed households. The pandemic does not seem to significantly affect the off-farm employment opportunities and optimal production choices of rural households. Generally, most rural households rely on farming as a source of income and livelihood, hence there is less wage employment. Pronounced impacts of HIV/AIDS on the household farming system become apparent when considering effects of adult mortality on maize production. HIV/AIDS-related deaths in families have negative impacts on maize systems. This has adverse impacts on food self-sufficiency and hence the food security of families that have suffered adult mortality. Observed monocultural tendencies among female-headed rural households in the study area further expose them to food insecurity.

Though HIV/AIDS does not seem to directly affect productivity and food security in rural households, it could be indirectly affecting these important livelihood indicators through its impact on other household socio economic factors hence the need for research to employ dynamic models to help explain such relationships and thus gain a greater understanding of the impact of HIV/AIDS on agriculture and food security in African rural societies.

The presence of HIV/AIDS has resulted in increased demand for health care. Affected families spend more on health care, hence the need to strengthen rural Community-based Care systems so that they can help such households effectively to mitigate the impact of the disease. This pandemic is also 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 the productive phase and pre-term mortality of productive family members has reduced family capacity to invest in

productive agricultural assets such as ox-drawn plows and important livestock, e.g. cattle. Although very modest, HIV/AIDS-affected families generally invest more in farming and education.

HIV/AIDS impact on key variables such as productivity and food security appears to be somewhat contradictory and at best ambiguous – especially given the confounding impacts of adult mortality and the macro policy environment. Regression analysis shows some somewhat contradictory results. Although HIV/AIDS is one of the important factors in explaining variations in food security, it is not important when explaining variations in productivity. 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 highlights factors that could be considered as intervention entry points for sustainable development, but the presence of other factors also influencing key impact variables raises many questions as to what extent should some of the observed changes in smallholder agriculture be attributed to HIV/AIDS. Unless these ambiguities are clarified – there will be academic and practical questions about relative implications of HIV/AIDS on smallholder-farmers. Hence the need to conduct research that will come up with proper methods of siphoning out the impacts on agriculture attributed to this dangerous disease.

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## Annex 1. Explanatory variables considered in each model

Variable	Expected Sign		Relationship with dependent variable
	Productivity	Food security	
Region	-+	-+	Region is expected to affect all the impact variables in either direction due to some positive and negative aspects that come with being in a given region.
Level of Education	+	+	Higher levels of education are taken to reflect better Management capabilities of the household head. Hence all impact expected to improve the more educated the farmer is.
Cultivated land		+	The bigger the land cultivated the higher will be food security. Food self sufficiency could be compromised if in crease in land cultivated means spreading of scarce inputs on a larger land.
Family labor/ size of family	+	+	Availability of labor is expected to positively affect all the impact variables as this could lead to full utilization of other resources such as land.
Total nitrogen or nitrogen per ha of maize	+	+	The higher the level of nitrogen used or applied per hectare of maize the higher will be maize productivity, food security and food self-sufficiency.
Number of cattle	+	+	Increases manure quantity and thus is expected to lead to an improvement in all the impact variables.
Gender of household head	-+	-+	Productivity and food self sufficiency are expected to improve with female-headed households whilst male and female headed or male-headed households are expected to be food secure.
Asset/wealth index	+	+	The wealthier the household the higher will be its productivity and food security.
Weighted index of the sick (WIS)*	-	-	WIS is an index scientifically formulated after considering the relative impacts in terms of lost productivity due to the sickness of a household member of a given age group. The higher the WIS the more afflicted will be household and hence the negative effect on the impact variables
Number of orphans*	-+	-+	Effect of orphans on the key impact variables will depend on their age. Older orphans are expected to provide more labor to foster family and younger ones to increase the burden of feeding more mouths.
Number of crops grown	-	+	Affect productivity negatively as demand on resources increases. Expected to affect food security in a positive way.
Maize yield/ ha		+	Expected to increase both food security.
Maize seed/ ha	+		Expected to positively affect productivity.
Status of household*	-	-	Affected households are expected to have lower levels of productivity and less food secure.
Social club	-+		Could affect maize productivity in either direction depending on the type of group and benefits that comes with belonging to that group.
Type of land	+		Wetlands are expected to increase productivity

\* HIV/AIDS related variables

## Annex 2. Graphical illustrations referred from text

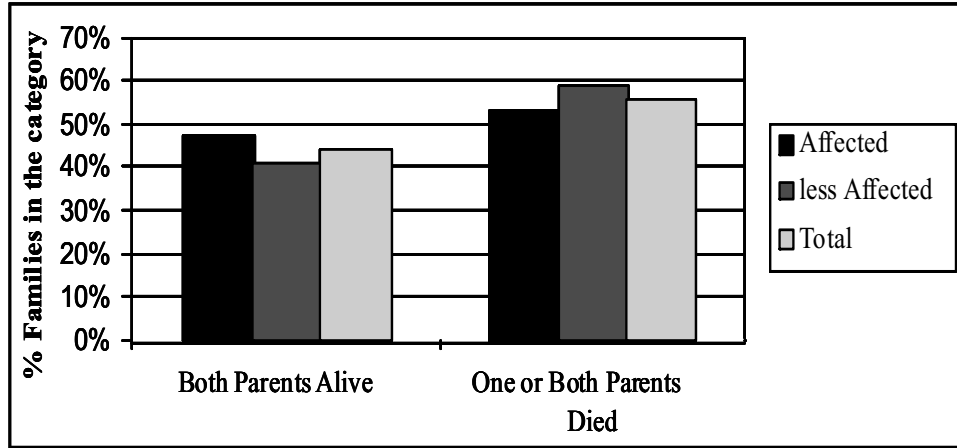


Figure A1. Incidence of mortality among HIV/AIDS most-affected and less-affected families

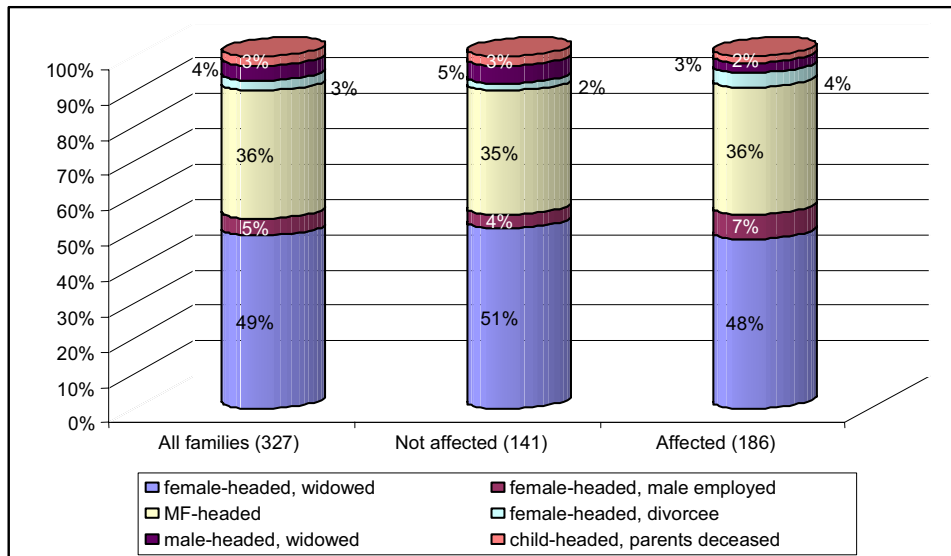


Figure A2. Differences in family structures of the sampled rural families

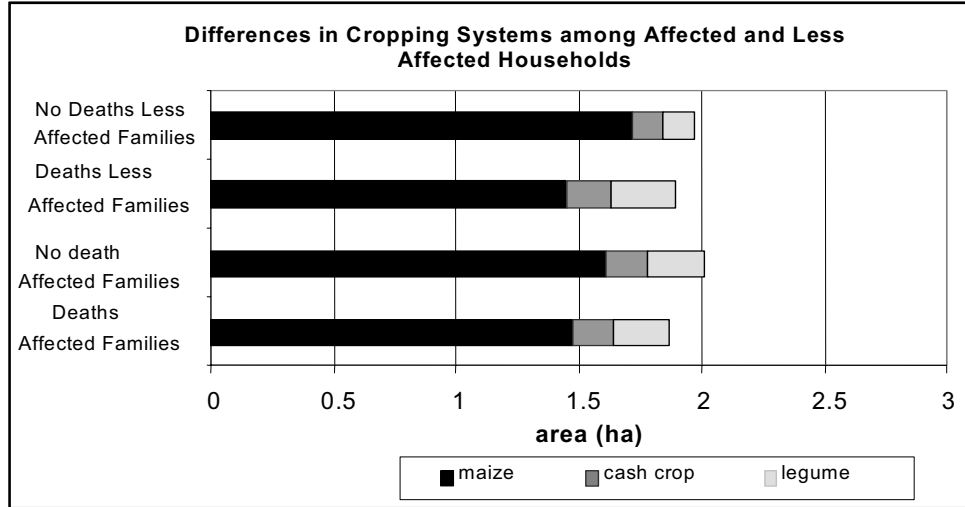


Figure A3. Differences in cropping systems

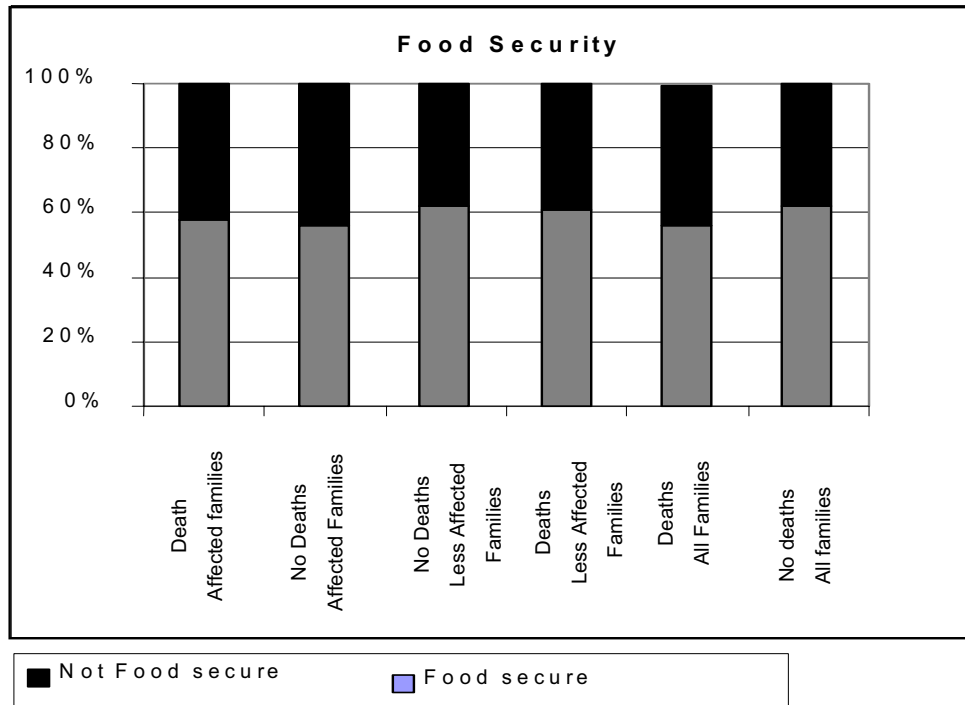


Figure A4. HIV/AIDS and food security

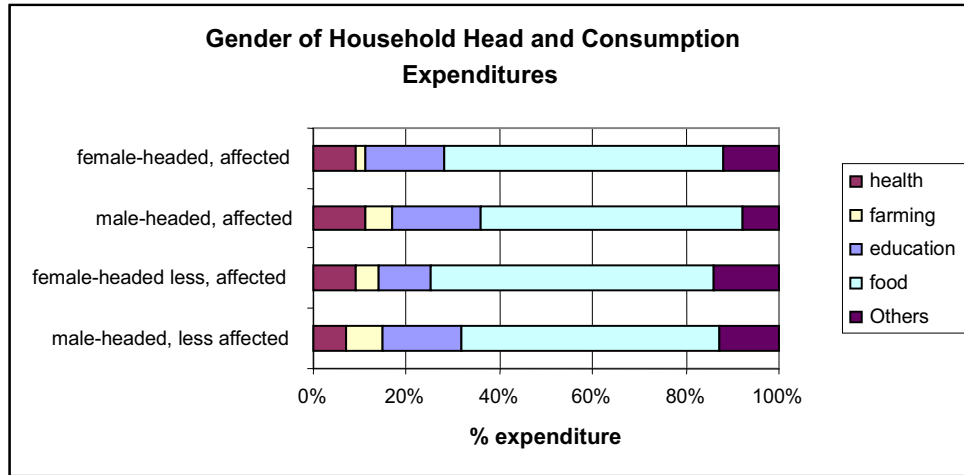


Figure A5. Gender and household consumption and investment activities

## **Impact of HIV/AIDS on agricultural development in Africa: an integrated review of literature**

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### ***Abstract***

*HIV/AIDS represents a severe burden on sub-Saharan Africa and it is compounding poverty in the continent. While over 2 million Africans had died of the disease by the end of 2001, 30 million others were living with the HIV virus. The socio-economic consequences of the disease are felt in health, agriculture, education, industry and the macro-economy. Because agriculture is at the heart of Africa's development on account of the need for food, raw materials, export earnings, employment and household as well as national income, HIV/AIDS portends a great danger for livelihoods if it takes hold and festers in this critical sector of the continent's economy. This paper examines the literature on the impact of HIV/AIDS on agriculture and rural life in Africa. The objectives are to examine various socio-economic effects of the disease in various parts of Africa; and to locate the prospects of agricultural growth in an economy defined by the HIV/AIDS pandemic. The paper then raises some pertinent issues that could form the basis for a systematic research agenda in this area.*

**Key words:** *HIV/AIDS, agricultural growth, labor, nutrition, macro-economy*

### **Introduction**

HIV/AIDS, like poverty, represents another burden confronting the sub-Saharan Africa. Poverty tends to compound AIDS while AIDS, in turn, tends to perpetuate poverty. The consequences of HIV/AIDS go beyond health. The epidemic has tremendous socio-economic effects on individuals, families, households, communities, groups and the entire society. It is not surprising that one of the major issues at the centre of development discourse in the last decade of the 20<sup>th</sup> century and which remains a potent challenge of the present millennium is HIV/AIDS. This is due to the ravages of the pandemic as well as to the helplessness of the entire humanity to find a cure to the disease. Today, there is no known cure for the disease. HIV/AIDS is not simply changing the demographic structure of countries where it has gained a foothold; it is also posing an irreversible danger to the economy of such countries. Available research findings indicate that HIV/AIDS has adverse impact on smallholder agriculture and rural non-farm enterprises. The disease affects mostly people within the ages of 15 to 45 years, whose age bracket has the most sexually active years as well as the most productive years of manual labor-dependent agriculture.

The African continent is stigmatized as the origin of the disease and also as having the highest incidence of HIV/AIDS in the world. The statistical configuration of the spread of the disease in Africa is staggering. In this respect the United Nations Joint Program on HIV/AIDS provides the following statistics:

- 2.3 million Africans were killed by AIDS in 2001
- Over 20 million Africans have been killed by the disease since the onset of the epidemic in the early 1980s
- Over 3.4 million Africans are infected yearly
- More than 30 million Africans are living with AIDS
- By 2010, about 50 million Africans will have died of the disease

AIDS is said to be deadlier than the wars pervading African countries in the past couple of years. Whereas, about 200,000 were said to have died in civil wars in Africa in 1998, about 2 million people died of HIV/AIDS in the same year. Because of its insidious ways, the disease destabilizes already fragile and complex geopolitical systems, AIDS has become a serious security issue in sub-Saharan Africa, so much so that the United Nations Security Council devoted its meeting of January 10, 2000 to discussing the theme: AIDS in Africa. This was the first time ever that this august body had dealt with a development issue.

It is in this light that this paper examines the incidence of HIV/AIDS in Africa from the perspective of the agricultural economy in the continent, using the results and findings from the literature. Specifically the paper addresses the following three objectives:

- examine the socio-economic impact of HIV/AIDS on African agriculture through an integrated review of the literature;
- locate the prospect of agricultural growth within an economy defined by HIV/AIDS;
- throw up some questions and issues for a systematic research agenda on AIDS in respect of the agriculture and rural economy sectors.

### **Literature survey**

The literature on the issue of HIV/AIDS is substantial and still increasing. The reason is that the disease is a global phenomenon causing untold hardship and wreaking havoc in many parts of the world. However, most of the available literature is in the area of health and prevention of the disease. To date, relatively little has been published on the socio-economic impact of the disease in developing countries. The available empirical information is variable in quality and substance. However, the social and economic consequences of HIV/AIDS are felt in health, education, industry, agriculture, transport, human resources

and the economy at large (Ajakaiye, 2002). Since agriculture is at the heart of Africa's development on account of its hosting 70% of the continent's labor force, the ravages of AIDS in this sector may spell doom for the continent. The review here concentrates on both the actual and the potential impact of the disease on agricultural production.

What has emerged from the literature is that HIV/AIDS imposes a burden on agriculture in African countries that have so far been relatively well studied. The ramifying impact of the disease is felt in several domains of agriculture and rural life as shown by studies in Uganda, Tanzania, Côte d'Ivoire, Angola and a few other African countries. Topouzis (1994) noted that the impact of the epidemic on agriculture is growing and the costs are largely borne by rural communities. The specific domains of impact in agriculture are as follows.

***Impact on agricultural labor supply***

Both the quantity and quality of farm household labor are reduced through incapacitation or death. The heterosexual nature of HIV transmission in Africa indicates that more than one adult per household may be infected. It is noted that the infection rates are higher among women. And, since women account for 70% of the agricultural labor supply and as much as 80% of food production, HIV/AIDS prevalence among womenfolk registers negatively on the quantity and quality of labor and on farm output (Baier, 1997). In addition, the care time for the AIDS patient invested by the seemingly healthy members of the household robs agriculture of labor. While this effect is applicable to most diseases, e.g. malaria, from which African smallholder farmers also suffer, the effects of HIV/AIDS is more telling because of its long-term impact. While, for instance, malaria may be treated and overcome within days of effective treatment and the victim may return to his work, it is not so in the case of HIV/AIDS, which may linger for several years with or without treatment and during which time the victim is perennially incapacitated.

***Impact on farm size***

If less labor is available then area cultivated in the predominantly peasant production system that still pervades most of Africa is greatly reduced to more manageable size. Remote fields may be left to fallow or abandoned altogether for lack of labor as a result of AIDS affliction. Even areas under cultivation may receive less timely attention either for tillage, planting or weeding (UNAIDS, 2000; Guerny, 2000; Over, 1998). It has also been observed that as a result of AIDS, crop varieties are declining, changes in crop patterns are occurring and cash crops are being abandoned for less labor-intensive subsistence crops (Guerny, 2000 and Topouzis, 1998).

***Impact on crops and farming systems***

A shift from high to low labor-intensive crops is already occurring. The FAO research findings in East Africa indicate that farm families affected by HIV/AIDS substituted cash crops for crops which require less labor and for which little fertilizer and herbicides are required (FAO, 1995). Households in Gwanda and Nakyerira regions of Uganda were observed to have abandoned coffee and, for replacement, instead cultivated cassava and banana that require less attention and care. Widows of AIDS victims also stopped cultivating rice and millet in favor of maize and cassava, which have some leeway for saving labor at some stages of production (Topouzis, 1994). AIDS-affected families in Zimbabwe were found to have also substituted cash crops (cotton and groundnut) with maize (Kwaramba, 1997).

***Impact on farm family assets***

The care required for HIV/AIDS patients costs much more than do the ordinary ailments from which farm families suffer. Farm income of smallholder farmers is grossly inadequate to meet daily needs let alone the burden of securing treatment for the diseases from which they suffer. Treatment of AIDS requires higher expenditure outlay than for the common diseases. Consequently, farm assets such as land, livestock, inventory stock and produce awaiting harvest may be disposed off to meet the cost of treatment for the HIV/AIDS patients.

***Impact on farm technology adoption***

HIV/AIDS-infected farmers face possible isolation and lack of interaction with non-infected farmers. The problem of being stigmatized may be very traumatic for AIDS sufferers, especially among a population that is still very much fatalistic and ignorant of facts about the much-dreaded AIDS disease. In such circumstances, HIV/AIDS-infected farmers may not make themselves available for training or exchange of extension information.

***Impact on knowledge and indigenous management skill***

Age and experience are synonymous with knowledge and skill in the African production environment. In Africa the indigenous knowledge system finds expression in addressing many agricultural production problems – weeding, pest control and storage practices. The illiteracy of the African peasant farmer ensures that the most potent practices are hardly recorded. HIV/AIDS may amplify loss of such skills and knowledge if the elderly succumb to the disease.

***Impact on general farm activities***

The effects here arise from loss of labor as a result of incapacitation or death caused by AIDS. A whole range of effects impact on general farm activities. These may include delays in operations, especially weeding, leading to poor harvest or total loss of crops. Pest infestation may not be adequately controlled by a farmer weighed down by disease. AIDS infection also implies inability to process crops or erect suitable storage structures.

***Impact on household nutrition***

Reduced capacity for farming translates to reduced subsistence ability of the infected household. This may be further complicated by lack of income to purchase food that the AIDS sufferer cannot produce on his or her own farm. Access to quality food such as meat, fish and vegetables may be obstructed, while there is an inevitable shift to low quality foods. In addition, frequency of eating may be reduced and limited to a few items that the available budget can accommodate.

**HIV/AIDS and agriculture: the case of Nigeria**

Agriculture is very important to Nigeria for several reasons. The major reason is that the sector contributes to the GDP in a very significant way in relation to other sectors of the economy as shown in the following average figures for 2000 to 2004 period:

Agriculture	41.5%
Industry	16.7%
Building and construction	2.1%
Wholesale and retail trade	11.6%
Services	28.1%

The role of agriculture in labor absorption, income generation for farming households, the supply of varieties of food to a rising population and the provision of raw materials to the emerging industrial agribusiness sector are very important to Nigeria. Nigeria also earns some foreign exchange from agricultural exports.

Nigeria has six agro-ecological zones and each is unique in land area, climatic features and farming systems. The Middle Belt of Nigeria, which is known as the «food basket» of the nation, produces rice, yam (34%), soyabeans (65%) and Irish potatoes (98%) in large quantities. However, HIV/AIDS is said to be more prevalent in this zone as shown by the following statistics:

- South East 4.3%
- South West 3.6%
- North West 3.5%
- North East 5.9%
- North Central 7.9%
- South South 7.5%

What this data indicates is that HIV/AIDS is at the heart of Nigeria's most potent agricultural production region. Since nearly two-thirds of the Nigerian population lives on agriculture as source of income and primary livelihood, it follows that if HIV/AIDS is allowed to spread through lack of control, it may not only overturn the production foundation of the country but also put the entire population in a grave danger.

The factors responsible for the spread of HIV/AIDS in Nigeria are: multiple sexual partners; coitus with commercial sex workers; and prevalence of sexually transmitted diseases. The high-risk sub-populations identified in Nigeria are: commercial sex workers, long-haul truck drivers and itinerant female sex hawkers. They are found in both rural and urban areas and may indeed, constitute main vectors in rural locations where long-haul drivers tend to stop for refueling and overnight sleep.

The Nigerian government and the people have not been complacent about the consequences of HIV/AIDS. Nigeria's response to the pandemic involves several programs and activities. These may be summarized as follows:

- National, state and LGA control programs;
- Blood safety practices
- Institutional strengthening and capacity building of health workers
- Condom social marketing
- Development of national policy on HIV/AIDS/STIs control
- Extensive education including the use of rural extension workers
- Special bodies established for HIV/AIDS control (Presidential Action Committee on AIDS; National Action Committee on AIDS).

#### ***Impact of HIV/AIDS on macro-economy***

An economy defined by HIV/AIDS suffers from lack of growth and development because the pandemic has negative impact on:

1. Returns to human capital investment and stock of human capital
2. Domestic capital formation
3. National income and output
4. Factor mobility, tourism and foreign investment

Since most of Africa relies on agriculture, HIV/AIDS prevalence in the continent may well signify the calamity awaiting the continent if the scourge is not halted. Consequently African countries must address the fundamental problem of insecurity fostered on the continent by the HIV/AIDS pandemic. The continent need not bemoan its ill luck but rather seek to implement measures to stop the spread of the disease. The proposed measures include:

- Political commitment
- Economic measures to control poverty
- Education, information and communication
- Effective HIV/AIDS program management
- Capacity building and institutional strengthening
- Resource mobilization and deployment
- Monitoring, evaluation and research

***Agenda for research***

Up-to-date knowledge and empirical evidence is required for effective planning and allocation of scarce resources for HIV/AIDS control. Areas of research are as follows:

- Micro-studies of impact on rural households affected by the disease
- Cross-sectional studies on farming communities-crop farmers, livestock producers, and fishing communities
- Farm enterprise-specific studies, e.g. prevalence rate among rice farmers and coping strategies
- HIV/AIDS impact assessment on farm income, productivity, labor, assets, etc
- The health-seeking behavior of farming households and its implications for HIV/AIDS control and management
- Economic decision-making of infected individuals and households
- Cost profile and finances of HIV/AIDS control measures among rural communities
- Social taboos and barriers to preventive and management initiatives for HIV/AIDS in rural areas
- Gender perspective studies – women, children, orphans and widows
- Macro-economic studies on long-term effects of HIV/AIDS on the economy.

## Conclusion

HIV/AIDS is a challenge to Africa where the disease tends to compound poverty. Since agriculture is the mainstay of the African economy, the sector must be insulated from HIV/AIDS. Sustainable agriculture production in Africa will still depend on the labor force for some time to come. Given the implications of the HIV/AIDS epidemic for economic growth and development, as discussed earlier and highlighted for those African countries for which empirical data are available, there is a need for African governments to take necessary measures to control the spread of the disease. Any negligence on the part of the governments will be costly to growth and development.

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## Women coping with HIV/AIDS in rural south-western Nigeria

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### **Abstract**

*This paper characterizes the impacts of HIV/AIDS on selected rural communities and households in south-western Nigeria and the subsequent coping strategies adopted by women in the communities covered in the study. Several findings emerged from the pilot study. First, is loss of labor leading to lower productivity and farm output and subsequently to constraining three dimensions of food security: food availability, physical and economic access as well as adequacy. There is also the dissolution of social safety nets. This direct effect of HIV/AIDS was particularly severe among widows in the study area. The ways women cope with the impacts of HIV/AIDS on household level varied considerably. However, the most frequently adopted coping mechanisms were those aimed at increasing or maintaining current levels of income and food supply, in spite of more demand for food due to HIV/AIDS attack. More than anything else, women were sensitive to livelihood diversification as a coping strategy. However, resources quickly dry up. The increasing number of child-headed households is an indicator of the degree to which the traditional social security networks are strained. A main conclusion is that the impact of HIV/AIDS can be felt at different levels, community and/or households. It can be difficult to distinguish the impacts of HIV/AIDS from the impacts of other problems, but it is clear that the overall impact of HIV/AIDS has been to make already existing problems (food insecurity for instance) and the consequences worse, and to create new problems. When HIV/AIDS strikes, it impacts negatively on all forms of assets, financial capital, human capital, social capital and natural capital.*

**Key words:** *coping, women, HIV/AIDS, south-western Nigeria, social capital*

### **Introduction**

This paper discusses women and HIV/AIDS in the rural areas of western Nigeria paying particular attention to the various ways by which they cope with the disease. The motivations for this study derive from the recognition that insight is urgently required into how rural women, who form about 70% of both the population and agricultural work force, cope with HIV/AIDS. There is also the conviction that by understanding and employing the existing coping mechanisms of women, the opportunity for proffering pragmatic recommendations for further interventions for integrating the impact of HIV/AIDS in agriculture and the entire rural milieu will be enhanced. Furthermore, the literature shows that women are particularly vulnerable to HIV/AIDS. They are more physically and socially vulnerable than men. They are also more at risk of being infected with the virus and often more vulnerable to the social and economic consequences of the disease.

On the basis of the above, this paper discusses women's coping mechanisms with HIV/AIDS. The paper opens with a literature review and analytical framework with some description of how the respondents are sourced and the sample area.

Tables 15, 16 and 17 depict prevalence of HIV/AIDS in Nigeria by state, 1991-2003, HIV prevalence in the South West Zone of Nigeria, by state and location, 2003 and HIV estimates and projection, respectively. The 100 women sampled in this study were arrived at using the assistance of some non-governmental organizations working on HIV/AIDS in Oyo and Osun states.

**Table 15.** HIV prevalence in the South West Zone by state and location, 2003

State	Site	Site status	Total sample	Number positive	Prevalence (%)	95% C.I.
EKITI	Ado-Ekiti	MT	300	5	1.7	0.5-3.8
	Ikole Ekiti	OMT	300	7	2.3	0.9-4.7
	<b>Total</b>		<b>600</b>	<b>12</b>	<b>2.0</b>	<b>1.0-3.5</b>
LAGOS	Ikeja	MT	350	27	7.7	6.0-12.8
	Lagos Island	MT	301	5	1.7	0.5-3.8
	Surulere	MT	300	8	2.7	1.2-5.2
	Badagry	OMT	350	22	6.3	4.0-9.4
	Epe	OMT	330	14	4.2	2.3-7.0
<b>Total</b>		<b>1631</b>	<b>76</b>	<b>4.7</b>	<b>3.7-9.8</b>	
OGUN	Abeokuta	MT	300	2	0.7	0.1-2.4
	Ijebu-Ode	OMT	299	7	2.3	0.9-4.8
	<b>Total</b>		<b>599</b>	<b>9</b>	<b>1.5</b>	<b>0.7 2.7</b>
OSUN	Osogbo	MT	300	2	0.7	0.1-2.4
	Ilesa	OMT	300	5	1.7	0.5-3.8
	<b>Total</b>		<b>600</b>	<b>7</b>	<b>1.2</b>	<b>0.5-2.4</b>
ONDO	Akure	MT	300	6	2.0	0.7-4.3
	Ondo	OMT	300	7	2.3	0.9 4.7
	<b>Total</b>		<b>600</b>	<b>13</b>	<b>2.2</b>	<b>1.2-3.7</b>
OYO	Ibadan	MT	300	5	1.7	0.5-3.8
	Ogbomoso	OMT	300	11	3.7	1.8-6.5
	Saki	OMT	299	19	6.4	3.9-9.7
	<b>Total</b>		<b>899</b>	<b>35</b>	<b>3.9</b>	<b>2.7-5.4</b>
<b>Zonal urban sites</b>			4929	152	3.0	2.6-3.6
<b>Zonal rural sites</b>			300	3	1.0	0.2-2.9

Zonal median prevalence = 2.3

Source: FMH, 2004. Technical Report, 2003 National HIV Sero-prevalence Sentinel Survey, FMH, Abuja

**Table 16.** Prevalence by State, 1991-2003

S/N	State	Year					
		1991/92	1993/94	1995/96	1999	2001	2003
1	Adamawa	0.3	1.3	5.3	5.0	4.5	7.6
2	Anambra	0.4	2.4	5.3	6.0	6.5	3.8
3	Benue	1.6	4.7	2.3	16.8	13.5	9.3
4	Borno	4.4	6.4	1.0	4.5	4.5	3.2
5	Cross River	0.0	4.1	1.4	5.8	8.0	12.0
6	Delta	0.8	5.1	2.3	4.2	5.8	5.0
7	Edo	0.0	1.8	3.0	5.9	5.7	4.3
8	Enugu	1.3	3.7	10.2	4.7	5.2	4.9
9	Kaduna	0.9	4.6	7.5 (estimated)	11.6	5.6	6.0
10	Kano	0.0	0.4	2.5 (estimated)	4.3	3.8	4.1
11	Kwara	0.4	2.4	1.7	3.2	4.3	2.7
12	Lagos	1.9	6.8	-	6.7	3.5	4.7
13	Osun	0.0	1.4	1.6	3.7	4.3	1.2
14	Oyo	0.1	0.2	0.4	3.5	4.2	3.9
15	Plateau	6.2	8.2	11.0	6.1	8.5	6.3
16	Sokoto	1.8	1.6	-	2.7	2.8	4.5
17	Abia	Not done	Not done	Not done	3.0	3.3	3.7
18	Akwa Ibom	Not done	Not done	Not done	12.5	10.7	7.2
19	Bauchi	Not done	Not done	Not done	3.0	6.8	4.8
20	Bayelsa	Not done	Not done	Not done	4.3	7.2	4.0
21	Ebonyi	Not done	Not done	Not done	9.3	6.2	4.5
22	Ekiti	Not done	Not done	Not done	2.2	3.2	2.0
23	Gombe	Not done	Not done	Not done	4.7	8.2	6.8
24	Imo	Not done	Not done	Not done	7.8	4.3	3.1
25	Jigawa	Not done	Not done	1.7	1.7	1.8	2.0
26	Katsina	Not done	Not done	Not done	2.3	3.5	2.8
27	Kebbi	Not done	Not done	Not done	3.7	4.0	2.5
28	Kogi	Not done	Not done	2.3	5.2	5.7	5.7
29	Nasarawa	Not done	Not done	Not done	10.8	8.1	6.5
30	Niger	Not done	Not done	Not done	6.7	4.5	7.0
31	Ogun	Not done	Not done	0.1	2.5	3.5	1.5
32	Ondo	Not done	Not done	Not done	2.9	6.7	2.3
33	Rivers	Not done	Not done	1.0	3.3	7.7	6.6
34	Taraba	Not done	Not done	6.0	5.5	6.2	6.0
35	Yobe	Not done	Not done	Not done	1.9	3.5	3.8
36	Zamfara	Not done	Not done	Not done	2.7	3.5	3.3
37	FCT	Not done	Not done	Not done	7.2	10.2	

Source: FMH. 2004. Technical Report, 2003 National HIV Sero-prevalence Sentinel Survey, FMH, Abuja

**Table 17.** HIV estimates and projection

<b>HIV Population</b>						
1 (millions)	2003	2004	2005	2006	2007	2008
Males	1.47-1.73	1.51-1.78	1.55-1.82	1.59-1.87	1.64-1.92	1.68-1.97
Females	1.75-2.06	1.8-2.11	1.84-2.16	1.88-2.2	1.93-2.25	1.98-2.31
<b>Total</b>	<b>3.22-3.79</b>	<b>3.31-3.89</b>	<b>3.39-3.98</b>	<b>3.48-4.07</b>	<b>3.56-4.17</b>	<b>3.66-4.28</b>
<b>New AIDS Cases</b>						
2 (thousands)						
Males	144.19-170.61	151.25-178.71	157.27-185.57	162.44-191.43	166.97-196.53	171.15-201.24
Females	160.63-190.26	169.12-200.02	175.76-207.57	180.74-213.1	184.63-217.35	187.73-220.66
<b>Total</b>	<b>304.82-360.87</b>	<b>320.36-378.73</b>	<b>333.02-393.14</b>	<b>343.18-404.52</b>	<b>351.6-413.88</b>	<b>358.87-421.9</b>
<b>Annual HIV + births</b>						
3 (thousands)						
Total	75.13-88.44	75.52-88.78	75.8-89.02	76.07-89.28	76.53-89.78	76.86-90.15
Percent	1.47-1.74	1.46-1.72	1.45-1.71	1.44-1.7	1.43-1.69	1.42-1.68
<b>Annual AIDS deaths</b>						
4 (thousands)						
Males	135.95-162.05	143.9-171.38	150.68-179.28	156.46-185.96	161.44-191.68	172.37-196.61
Females	149.99-179.01	160.08-190.93	168.28-200.5	174.69-207.87	179.5-213.27	190.81-217.37
<b>Total</b>	<b>285.93-341.06</b>	<b>303.98-362.32</b>	<b>318.97-379.78</b>	<b>331.15-393.83</b>	<b>340.95-404.95</b>	<b>363.18-413.98</b>
Per thousand	2.16-2.58	2.23-67	2.28-2.73	2.31-2.76	2.31-2.76	2.4-2.75
<b>Cumulative AIDS</b>						
5 deaths (millions)						
Males	0.95-1.13	1.1-1.31	1.25-1.49	1.41-1.67	1.57-1.86	1.74-2.06
Females	0.97-1.15	1.13-1.34	1.3-1.54	1.47-1.75	1.65-1.96	1.84-2.18
<b>Total</b>	<b>1.92-2.29</b>	<b>2.23-2.65</b>	<b>2.55-3.03</b>	<b>2.88-3.42</b>	<b>3.22-3.83</b>	<b>3.58-4.24</b>

Source: FMH 2004 Technical Report, 2003 National HIV Sero-prevalence Sentinel Survey, FMH, Abuja

Agriculture, particularly smallholder agriculture, is the backbone of the economy in most parts of Africa. A quick overview of the population distribution patterns in the 25 African countries most affected by HIV/AIDS suggests that more than two-thirds of the population in these countries live in rural areas. In absolute numbers, more people living with HIV/AIDS live in rural areas, where health services and information are less available than in the cities. Increasing contact between rural and urban areas through trade, migration and improved transportation networks have made HIV spread fast in rural areas where HIV/AIDS disproportionately affects labor-intensive sectors, such as agriculture.

Productivity in a community based on labor-intensive agriculture decreases when an agricultural worker falls ill and dies. In small-scale agriculture in sub-Saharan Africa, labor shortages due to HIV/AIDS combine with declining household income to compound food and livelihood insecurity and contribute to changes in farming practices and farming systems. The links between AIDS, food insecurity and poverty are strong. At the same time, growing poverty and food insecurity is increasing rural peoples' vulnerability to AIDS.

According to FAO and UNAIDS, HIV/AIDS affects women disproportionately (FAO,

UNAIDS 1997). Women whose husbands are migrant workers are especially vulnerable to AIDS, since their spouses often have several partners. Studies in Africa show that many married women have been infected by their only partner: their husband (UNAIDS 1997). Simply being married is a major risk factor for women, since they have little control over sexual abstinence or condom use at home or their husband's sexual activity outside. Physically, women are more vulnerable to the disease.

Agriculture and health are closely linked. Agriculture provides food essential to health, and it is the basis for most rural livelihoods. Healthy people provide the labor and knowledge that underpin agricultural production and innovation. AIDS has for a long time been perceived as an urban disease. In absolute numbers, however, there are more people living with HIV/AIDS in rural areas of the world. These people are especially vulnerable to the impacts of the disease, and it adds an additional dimension to other vulnerabilities, with significant implications for rural households.

In order to improve the conditions of rural families affected by HIV/AIDS impacts, it is necessary to have more knowledge about their situation. It is important to know about the coping strategies that already exist and are being exercised by families and communities affected by the HIV/AIDS epidemic. By knowing which coping strategies are efficient and how they work, it may be easier for organizations working with the issue to find ways of assisting in improving the livelihood systems of rural households affected by HIV/AIDS. It is important to strengthen the local coping strategies, rather than impose unfamiliar coping strategies upon the affected people.

The reason for focusing on women in this paper is primarily because women are more seriously affected both by the disease itself and by its impacts. Men tend to be relatively cushioned after a wife's death, since he can rely on other wives in the case of polygamy, or he may even start looking for a new wife while the first one is ill. Nevertheless, women have traditionally received very little special attention in the AIDS-literature (Garcia-Moreno 2000). When they are considered, it is mostly as transmitters of the HIV-virus and not as sufferers of the disease and its impacts. The study on which this paper is based looks at HIV/AIDS and rural livelihood with special reference to women's coping mechanisms.

## **Literature review and analytical framework**

### **Aids in a rural setting**

In-depth research on the socio-economic consequences of HIV/AIDS in sub-Saharan Africa was first undertaken in the late 1980s and early 1990s when the presence of AIDS

became visible and concerns were raised over its future impact (White and Robinson 2000). These studies mostly focused on the future, potential impact of HIV/AIDS on agriculture since the actual impacts were, in most cases, yet to be seen and investigated.

Among the first to study this were Tony Barnett and Piers Blaikie, who studied the impact of HIV/AIDS on rural livelihoods and food production in Rakai, Uganda in 1989-90 and published the book *AIDS in Africa: its present and future impacts* in 1992. Perhaps the most important legacy from their research is the way in which they categorized households in relation to the impact of HIV/AIDS as AIDS-afflicted households, AIDS-affected households and non-affected households. This has been, and still is, widely used in AIDS-related research. Barnett and Blaikie also found that women are generally more vulnerable to the impact. FAO was the first UN agency to imitate detailed sector analysis of the socio-economic impacts of HIV/AIDS on rural economies. FAO first studied the impact of HIV/AIDS on the agricultural production and food security of both small farm households and commercial farmers; for example, the effects of HIV/AIDS on farming systems in Eastern Africa (1995), and in West Africa (1997).

FAO was also the first to recognize HIV/AIDS as a development problem, and not merely a health problem. Today, FAO is also focusing on examining the possible responses from the agricultural sector to the epidemic. The FAO/UNAIDS joint publication *Sustainable Agricultural/Rural Development and Vulnerability to HIV/AIDS* (1999) focuses on the linkages between HIV/AIDS and socio-economic, demographic and socio-cultural factors, which may add to or diminish risk behavior. The study illustrates that vulnerability to poverty, food/livelihood insecurity, gender inequalities, migration, war and civil conflict, etc, has a catalytic effect on vulnerability to HIV.

### **Sustainable livelihoods - an analytical framework**

In order to analyze the impacts of HIV/AIDS on rural livelihoods it is important to provide a framework within which to assess the epidemic. The concept of sustainable livelihoods is increasingly important in the development debate, especially regarding rural development, poverty reduction and environmental management (Scoones, 1998). According to Ellis, livelihoods are defined as the activities, the assets and the access that jointly determines the living gained by an individual or household (Ellis, 1999, in Haug 1999:182). A livelihood system is an environment of human activity, which is both aggregate and dynamic and which integrates both the opportunities and assets available to men and women as means of achieving their goals and aspirations. In addition, it includes interaction with and exposure to several beneficial or harmful ecological, social, economic and political factors that influence their capacity to make a living.

The concept of sustainable livelihoods has been defined in many different ways. According to the IDS sustainable livelihoods team, drawing on Chambers and Conway (1992), a livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Scoones, 1998:5).

Scoones established the framework for analysis of sustainable livelihoods (fig. 9), which is being widely used in livelihood-research and in the study on which this paper is based. The framework is a tool to improve our understanding of livelihood, particularly the livelihoods of poor people and their coping mechanisms. It helps to organize the various factors that limit or provide opportunities and to show how these are related to each other. In Scoones' words the framework shows how in different contexts, sustainable livelihoods are achieved through access to a range of livelihood resources (naturally economic, human and social capitals) which are combined in the pursuit of different livelihood strategies (agricultural intensification/extensification, livelihood diversification and migration). Central to the framework is the analysis of the range of formal and informal organizational and institutional factors that influence sustainable livelihood outcomes.

HIV/AIDS impacts systemically on all the factors of the framework, on the different types of capital, on the institutional processes, on the livelihood strategies and the livelihood outcomes. Consequently, many researchers refer to HIV/AIDS as an epidemic with a systemic nature (Mutangadura 1999). The framework was not followed rigidly in this study but on critical variables of interest.

### **Livelihood resources**

***Economic/financial capital:*** the capital base said to be capital (cash, credit/debit, savings etc) people possess or the assets/goods they have that may be exchanged if the distribution system is partly reciprocal (in this case the economic capital may be partly the same as natural capital). Human capital such as labor force, good health, knowledge and skills, etc.

***Natural capital:*** refers to access to natural resources (soil, water, air, forests, pasture, genetic resources, etc) and environmental services.

***Livelihood strategies:*** the framework identifies three clusters of livelihood strategies, which are agricultural intensification/extensification, livelihood diversification and migration (Scoones 1998).

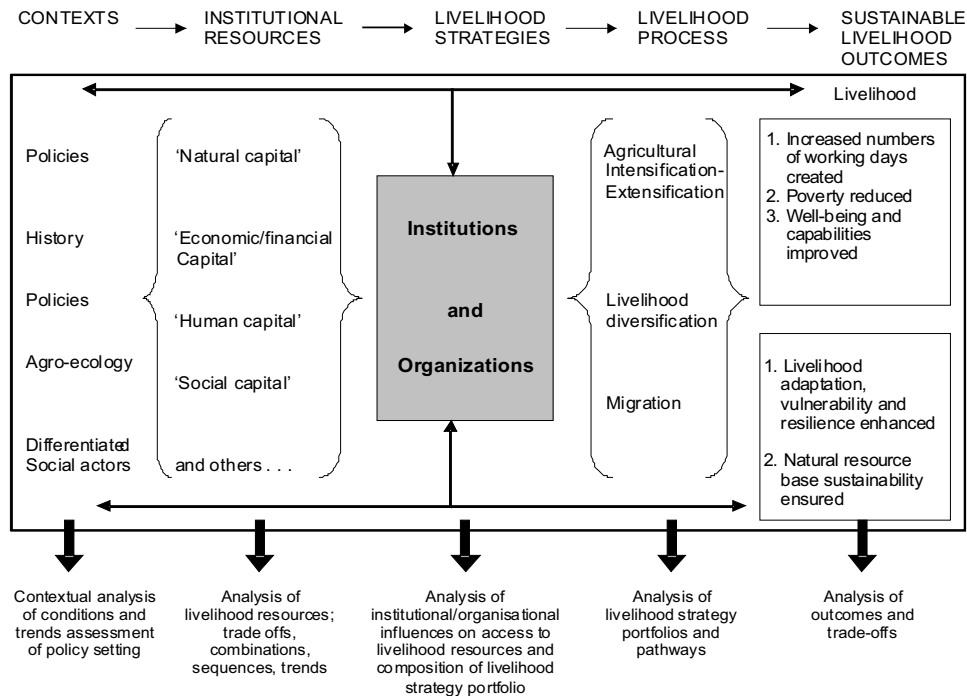
***Agricultural intensification/extensification:*** agricultural intensification can be defined as increased average inputs of labor or capital on a smallholding, either cultivated land alone, or on cultivated and grazing land, for the purpose of increasing the value of output per hectare (Tiffen *et al.* 1994, in Hussein and Nelson 1998). Through this process more livelihood through agriculture can be accomplished. This can also be done through agricultural extensification, which means that more land is under cultivation (Scoones 1998).

***Livelihood diversification:*** livelihood diversification can be defined as the process by which rural families construct a diverse portfolio of activities and social support capabilities in their struggle for survival and in order to improve their standards of living. This definition implies that livelihood is more than just income, as has been argued by the Sustainable Livelihood school. Diversification can occur both as a deliberate household strategy and as an involuntary response to a crisis.

***Migration:*** in this connection migration refers to moving away permanently or temporarily, in search of work. In an HIV/AIDS setting, migration may also be due to discrimination and stigmatization.

***Institutions and organizations:*** central to the framework is the analysis of the range of formal and informal organizational and institutional factors that influence sustainable livelihoods outcomes. Institution is defined as regularized practices (or patterns of behavior) structured by rules and norms of society, which have persistent and widespread use. This means that institutions may be both formal and informal.

**Figure 9.** The sustainable livelihood framework



## Methodology

This study selected 100 women afflicted or affected by HIV/AIDS in Oyo and Osun States. The selection was purposive and non-governmental organizations working in the area of HIV/AIDS in this area were used to get at the respondents. The data was collected using a checklist that was to a large degree based on the elements of the sustainable livelihoods framework. The analysis focused mainly on the livelihood resources and livelihood strategies, and the way in which institutions and organizations influence both. The data was thus arranged into data about impacts of HIV/AIDS, data about land rights for women and data about coping mechanisms.

None of the respondents was younger than twenty-one years old and none was older than sixty years. Most of the HIV-positive women interviewed were working in the informal sector and many were occupied in subsistence agriculture. The general impression gathered from the fieldwork is that men are more reluctant to take the HIV-test than women.

## **Common constraints to effective action**

Often HIV/AIDS is not acknowledged, as attitudes and practices related to sexual behavior are not openly discussed in most cultures. A strong reluctance to recognize and address the real situations that contribute to the spread of HIV/AIDS is common. In both developed and developing countries, high-risk sexual behavior and intravenous drug abuse are at the heart of the contagion; yet most governments and societies have shield away from dealing effectively with the root causes.

It is difficult but necessary to confront many topics, for example, women's vulnerability to high-risk sexual practices; multiple sexual partners outside of marriage or other stable unions; the spread of the disease by people who travel widely; the exploitation and sale of children and women into prostitution and virtual slavery; HIV/AIDS in prison populations; and the destitution and deprivation of AIDS orphans struggling to live on the streets. When these social factors are combined with the great lack of public information on the extent, causes, consequences and means of preventing HIV/AIDS, efforts to deal with the epidemic are seriously constrained.

Stigmatization and marginalization of people and households living with HIV/AIDS is another constraint. Such discrimination can interfere with the transmission of prevention messages; discourage the adoption of voluntary counseling, testing and access to early care; give the appearance that individual and social denial are legitimate and make it difficult for people living with HIV/AIDS to be involved in mitigation efforts and for people who are not infected to talk about the virus and adopt safer practices.

The HIV/AIDS epidemic and strategies for mitigating its impact are often not given specific attention by rural development workers. Projects operating in high-reverence area inadvertently bypass the households struck by the epidemic, as those households have neither time nor resources to participate in, and benefit from, project activities. This frequently leads to further marginalization and destitution of affected households.

The lack of adequate health care and social services limit initiatives to combat the epidemic through medical treatment. The high cost and limited availability of drugs to fight both the primary HIV infection and secondary infections and associated opportunistic diseases are serious constraints to effective HIV/AIDS programs

***Lack of labor:*** one of the immediate consequences of HIV/AIDS is its toll on the human capital base in this context, human capital refers to labor, knowledge and capability. Infected persons die prematurely, and before that, opportunistic intentions contribute to the person's inability to work. A focus group interview with HIV-positive women in this

study showed that the women (85%) expressed concern about the loss of labor force in the community. They claimed that due to this loss, food availability had decreased in many households and also in the local markets, with a decrease in food security as a result (95% indicated).

At the same time, the epidemic can lead to an increased access to labor for some. Many of the HIV-affected households have been forced to work more in order to meet increased demands for income, and some have even been forced to sell their land to pay for medications, etc. These people frequently start working as casual laborers on other peoples' land in exchange for food or cash. Consequently, the HIV/AIDS epidemic in some cases creates more a accessible labor force for those who can afford to pay for it, even though the total amount of actual labor in the community is decreasing.

**Orphans:** the HIV/AIDS epidemic has led to a large number of orphans. This was another concern expressed in the focus group interview (by 75%). An orphan is defined as a child under 18 years old who has lost at least one of his/her biological parents. According to the informants, the phenomenon of street children, which was earlier limited to the towns and cities, is now also appearing in the villages. The informants claimed that in many cases, orphans are sent away to stay with relatives in the same village or in other villages. Frequently, siblings are separated because the relatives don't have the capacity to take in all of them. In these cases, the child experiences a second loss through this separation.

**Pressure on the traditional social security systems:** the extended family; HIV/AIDS is extracting a major toll from the extended family. The high number of child-headed households is an indicator of the degree to which the AIDS epidemic has strained the traditional coping strategies and security net of the extended family. It has often been claimed that a catastrophe such as the AIDS epidemic can only be managed in the African situation where the extended family network is prominent. In spite of the pressure on this traditional coping strategy, it appears that the extended family is still the institution that is probably most important in cushioning the impacts of HIV/AIDS. This was alluded to by 65% of those interviewed.

**Social networks:** the problem of orphans illustrates how HIV/AIDS is weakening the traditional social security system. Many of these systems can be classified as social networks. Social networks in a community can be defined as a set of relationships activated for a particular end (Eriksen 1995). Thus, different networks have different ends, e.g. saving networks, farmers' networks and women's networks. In a community, all types of social networks may diminish due to the morbidity and mortality connected to HIV/AIDS.

***Impacts of HIV/AIDS on the households:*** a household can be conceived as the social group which resides in the same place, share the some meals and makes joint or co-ordinated decisions over resource allocations and income pooling. For households, the immediate impact of HIV/AIDS is to the health and nutritional status of the person infected. A second stage concerns he ability of the affected household to produce and/or buy food under conditions of reduced labor or income, and a greater demand for healthcare and social support (FAO 2001). Effects on households include time spent nursing, non-attendance of school by children loss of saving, assets sale, etc.

***Impact on human capital:*** lack of labor and human capital can be characterized as the overall problem for affected households, if disregarding the emotional distress and grief, and it is to a large degree the basis for the other consequences. About 95% response was obtained, for further probing into the interviews revealed that morbidity and mortality had a substantial impact on agricultural yields because of their negative effect on household labor, which is the foundation of extensive subsistence farming. Nearly all the respondents (98%) opined that due to HIV/AIDS, household labor quality and quantity had been reduced the last few years. For those who had already lost someone, the deceased person's labor was lost forever. For those who had a sick person in their household, a considerable amount of time and energy was diverted to taking care of the patients.

***Problems with crop management:*** delay in planting and harvesting is a result of lack of labor and it is a serious threat to food security in many households. Affected patients will not have the energy to plant before the rainy season, which invariably affects the food security at household level in the dry season. Labor available for harvesting is also restricted. Crops are, therefore, destroyed as a result of late harvesting

***Food insecurity and poor health:*** with lack of labor, in addition to the risk of delaying the planting, the household is often not able to grow enough food (85%). In this situation, it is easy to be caught in a vicious circle where a person is not able to grow food due to lack of energy, which again is due to lack of food because nobody works in the field. HIV/AIDS can rapidly lead to malnutrition, both for those suffering from the disease and for those in the same, affected household. The coping strategies often adopted by HIV/AIDS-affected households also often leads to food insecurity; persons living with HIV/AIDS, have higher than normal nutritional requirements for up to 50% more protein and up to 15% more calories (Gillespie and Haddad 2002). This additional nutrition is often taken from food originally meant for the others in the household, leading to a deteriorated diet for them.

***Loss of skills and knowledge:*** the collected data indicate that children are working more in the agricultural fields when one of their parents or guardians is sick (95% of the women indicated this). The fact that many children are taken out of school in order to work in the fields substantiates this indication. A further conclusion may be that as a result of this the children are learning more about agricultural methods than they do when they spend a lot of time in school, and that they also increase their ecological knowledge. As shown in the focus group discussion, the possible consequence of the epidemic on effective labor supply that rising adult mortality seriously affects the transmission of acquired skills and knowledge may not always be applicable. However, HIV/AIDS may lead to children with inadequate or non-existent agricultural knowledge and skills due to the death of the older generation (85% of the women confirmed this).

***Impact on economic/financial capital:*** this includes income reduction. As a consequence of the loss and diversion of labor, the income in a household with AIDS patients is usually reduced. All the members of the focus group discussion confirmed this. During the study, the women interviewed noted that household income had decreased in the last few years due to the impact of HIV/AIDS. Consumption had also decreased for most of the family members. Again all the members of the focus group discussion attested to this.

The degree to which the income is reduced depends, of course, on how many of the household members are infected, at what stage in the disease they are and what kind of labor they contribute to the household.

***Increased expenses:*** at the same time as labor is lost due to death, illness and diversion of time for caring for the ill, all households with HIV/AIDS patients experience increased direct expenses. All respondents attested to this. HIV/AIDS affects the availability of disposable cash income. When the patient is sick, household financial resources may be diverted to pay for medical treatment, transport to hospital and so forth. About 80% of the women interviewed reported that they had to spend more money on proper food, blankets, etc. when their husbands were sick. A woman noted that the medical costs associated with caring for the sick have to be borne along with the funeral expenses of family members who die of the disease. In some settings, funeral expenses appear to be higher than medical expenses.

***Increase in dependency ratio:*** thirty percent of the women interviewed were currently taking care of orphans or children whose parents were unable to take care of them, both from their own and from their husbands' side of the family. Many of these children had lost their parents to AIDS. After the husbands had passed away, the widows were often left with a large number of dependents at the same time as the household's resources

had been severely strained during the illness of the husband. All the respondents attested to this. The dependency ratio of the household changes adversely when a household is enlarged by children who are dependent on the adults for their survival. The dependency ratio is the ratio between ‘producers’ and ‘dependants’.

***Impact on social capital:*** social networks are reduced by the HIV/AIDS pandemic. This impact on traditional social security systems at community level is primarily felt at household level. Most respondents (85%) have experiences of losing several family members to AIDS. In this situation, this same number of respondents opined that it is a natural consequence that the social network of the household diminishes.

***Discrimination and stigmatization:*** Social capital is in some cases undermined by the stigma of being HIV positive or having HIV-positive persons in the family. In a focus group interview with only affected members, 90% of the women expressed frustration over the discrimination they had been exposed to in their village after people heard that they were HIV-positive. One woman, who tried to earn a living through casual labor, spoke for all her HIV-positive colleagues when she said: ‘People don’t want to employ us when they hear that we are infected’.

Adeyeye (2001) describes coping as the ways in which we all recognize that our normal expectations of how life is and ought to be are adjusted on realizing that ‘normality’ has, for whatever reasons, switched to ‘abnormality’. He also opined that the rationality earlier used when coping with a crisis such as drought, famine, war and social and economic disaster is not adequate for coping with the impacts of HIV/AIDS.

### **House coping strategies**

Households are the first social safety net in all communities, and they show a strong resilience in the face of setbacks (UNAIDS 2002). The women interviewed adopted a wide variety of coping strategies.

***Coping with loss of labor and land:*** this is done in several ways, e.g. shifting to less labor-intensive crops. In the focus group interview with HIV-positive women, it became clear that the majority of the women had stopped working with the most labor-intensive crops.

The shift to less labor-intensive cropping is a natural strategic response to lack of labor and energy, as well as to the lack of pesticides and fertilizers.

***Decrease in area cultivated and less variation in crops:*** another response to lack of labor is to reduce the area on which the crops are cultivated. More remote fields tend to be left fallow and the total productivity of the agricultural unit consequently declines. As with a shift to less labor-intensive crops and subsistence crops, this may also lead to food insecurity in the household.

About 55 percent of the women interviewed have cut down their farm size,

***Working on other peoples land:*** working on other people's land was an important source of income for those informants who had lost access to land; out of the 45 percent of the respondents that use this argument, the income of 70 percent of them has dropped.

This type of migration exposes the receiving community to risk, and thus influences the vulnerability context of the whole community.

***Eating less:*** the majority of the women said they had less food available in the household now than before. By 'before', they mean before they fell sick or before they lost their husbands.

Food availability is determined both by the amount of food produced by the household and by the purchasing power of the household. Both are usually reduced in affected households.

Consequently, the number of meals per day is reduced as well as the number of ingredients in the meal. About 45 percent also complained that they were not able to buy meat or fish anymore, and that they had to rely on wild greens.

***Begging:*** begging as a coping strategy was only encountered in five of the 100 cases.

***Sale of land and other assets:*** in order to meet the increased expenses, many households are forced to sell their various assets, thus leading to a decrease in the household's economic/financial capital; 10% of the respondent in this study sold land or other assets.

Sale of productive assets also it made difficult to pursue livelihood diversification. One of the informants sold her husband's land in order to pay for medicines.

***The children's role:*** research has shown that it is quite common to take the children out of school when income decreases and expenses increase. School fees may be the largest recurrent household expense for many families.

Another reason for taking children out of school is the demand for labor in the family. Children are important as workers. Letting the children work is a way of reducing the dependency ratio in that the dependants become producers earlier than normal. Eighteen percent of the informants reported that the children helped them on the farm and 10 percent of them also sent their children to work on other people's farms for payment.

**Trading sex:** some of the women interviewed were using sex as a means of income (20% reported this). Cohen (1998) claims that poor women who head poor households often engage in commercial sexual transactions, sometimes as commercial sex workers but more often on an occasional basis as a survival strategy for themselves and their dependents. It should be noted in this connection that the boundaries of sex are often blurred in rural communities (Topousiz and du Guerny 1999). It is therefore problematic to call it commercial sex work, because it is more a matter of sexual favors being compensated in different ways, not only with money but also with other favors, food, clothes, etc.

FAO-studies recognize that a result of the impact of HIV/AIDS is that there seem to be growing reliance on off-farm, income-generating activities (FAO 1995). They note that female-headed households in particular appear to seek small-scale, income generation opportunities as a direct response to the impact of HIV/AIDS.

## **Recommendations**

### **Guiding principles for responding to the HIV/AIDS crisis**

While actions to respond to HIV/AIDS will vary, experience indicates that several principles underlie successful initiatives to combat the epidemic:

- **Dynamic leadership and political commitment at all levels are imperative for effective action to prevent HIV/AIDS and mitigate its effects**

Without the committed support of political social institutions, the resources required to cope with the epidemic will not be forthcoming. Endorsement at the highest political level for cross-sectoral action is an essential step.

➤ **Preventing the spread of the infection is of paramount importance**

Without halting the spread of the disease, efforts to mitigate its effect will never be sufficient. Each government must decide how its ministries and development partners can contribute to prevention efforts.

➤ **Prevention of HIV/AIDS in poor communities can only be accomplished if immediate assistance and development initiatives are also carried out**

The basic goal is to help create the conditions in which both infected and non-infected individuals can live with dignity and security even in highly affected areas. Meeting the immediate food and other basic needs of destitute households is essential. Halting risky sexual and social behaviors, including, for example, the trading of sexual favor for food, goods and services, is crucial to this goal. This particular example is especially important as the poverty arising from HIV/AIDS spreads and creates greater destitution among adolescents and young adults who must then look for ways to survive.

➤ **A people-centered, multi-sectoral, community-based approach to development is fundamental for creating and sustaining the conditions in which HIV/AIDS can be prevented and its impact addressed most effectively.**

In many ways the problems associated with widespread HIV/AIDS – poverty, food insecurity, discrimination and social marginalization, time and labor constraints, disability and untimely death – are similar to, but more severe than, problems seen in most poor communities. The same basic participatory appraisal and planning approaches for developing and implementing appropriate solutions should be employed.

➤ **Linking HIV/AIDS and food security initiatives can most effectively be accomplished by the reciprocal incorporation of HIV/AIDS considerations into food security initiatives and the incorporation of food security objectives into HIV/AIDS programs.**

The need is to ensure that the constraints that HIV/AIDS produces – whether it affects households, communities or nations – are recognized and addressed by policies and programs in relevant social, economic and agricultural sectors. HIV/AIDS awareness and action need to be mainstreamed into agriculture and development planning, just as food security issues need to be addressed by HIV/AIDS policies and programs.

## **Conclusion**

In this paper an attempt has been made to characterize and assess the impacts of HIV/AIDS on the livelihoods of moral women and the different ways in which they cope with these impacts. Suffice to say that this is a location-specific study with the risk of over generalization. The study purposively selected one hundred women who are already suffering from HIV/AIDS and focused on their households. One of the main conclusions in this study is that impacts of HIV/AIDS can be felt at different levels: household and community.

Increasing prevalence of female- and child-headed households transcend the various traditional social security networks. At the household level, the cost of HIV/AIDS includes cost of medication and hospital bills, cost of funerals, loss of labor and a decline in potential income; another cost is loss of human capital due to morbidity and mortality. Discrimination and stigmatization and other associated costs are prevalent among individuals and households affected by HIV/AIDS. The degree of impact of HIV/AIDS depends on the resilience of the system and its coping strategies. Nevertheless, the impacts of HIV/AIDS are felt first in the households of infected individuals.

Wide varieties of coping mechanism were observed in the study area. In general, however, for the women studied, it seems social and human capital is more decisive to coping than economic capital.

HIV/AIDS impacts across individual households and communities also constrain availability of, physical and economic access to and the adequacy of food intake.

In checking the effect of HIV/AIDS on food security it is important to focus not only on the individual households but also on entire local communities in the utilization work.

Findings in this study on the effects on women tend to suggest that from an equity point of view, women should have the same rights as men to owning property. HIV/AIDS impact on women and how this subsequently affects children suggest the need to develop HIV/AIDS investigation on women and children jointly.

Finally, improving livelihood security for the infected women (e.g. through enhanced access to factors of production, land, credit, farm input, appropriate technology, etc.) may check considerably the spread of the disease and reduce its propensity to accelerate problems of food security.

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## **Intervention**

### **Testimony of a person living with HIV/AIDS (PLWHA)**

Mr Houessou Comlan is a farmer and PLWHA in the Couffo district in southern Benin. He is married to two wives and has five children. He discovered his status as a PLWHA in November 2003, and as a result was divorced by one of his wives. Very luckily none of his children is infected. He continues to have protected sex with his wife. Mr Houessou does not know how he became infected and is currently receiving medical treatment with ARV drugs offered by the international NGO Medecins sans Frontieres, while IFAD (an NGO with a local base) takes care of schooling for his five children. He feels particularly lucky as not all the PLWHA in Benin benefit from such medical care. Yet, Mr Houessou has some unmet needs. As a result of the HIV/AIDS-related infection he can no longer work at his previous full capacity and this has exposed his family to food insecurity. He called on the national authorities to extend the medical coverage to all the PLWHA in the country. Mr Houessou suggested that farmers' groupings be associated in the process of strategies definition to combat the pandemic. He made a strong plea to the workshop to help sensitize the government of Benin on the need to make ARV drugs available to all the PLWHA across the country.