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Setting the scene

1. Impact of HIV and AIDS in Southern Africa

The HIV and AIDS epidemic is one of the greatest challenges facing the southern African region. With 24.7 million people living with HIV and AIDS, Sub-Saharan Africa (SSA) has 63 % of the world's adults and children living with HIV. A disproportionate number (59%) of all those living with HIV in SSA are women and girls. UNAIDS (2006) estimated that in 2006, 2.8 million Africans became infected, and in spite of increased access to antiretroviral drugs in many countries, it is reported that 2.1 million people have died of AIDS related illnesses.

Early responses to the epidemic were limited due to the stigma, discrimination and denial surrounding HIV. Political and economic leaders failed to recognise and effectively address the epidemic. As a result, development of effective policies and programmes has been slow. At the regional level, the threat posed by HIV has since been acknowledged. In 2003, the SADC Heads of States signed the Maseru Declaration on HIV and AIDS, thereby committing the signatories to address the impact of HIV. The SADC secretariat and HIV and AIDS unit were strengthened and every country within the SADC region established a National AIDS Commission. Despite these recent efforts, the high rates of HIV infection, illness and deaths continue to have a severe impact on the overall social, cultural and economic environment in the southern African region.

HIV and AIDS related adult morbidity and mortality are principal factors undermining socio-economic development. Decreasing life expectancies, as reported in SADC's Regional Human Development Report (2000), demonstrate the worrying impact of HIV on the most-productive age groups. Rural farming households in the region are becoming poorer and more vulnerable to the consequences of food insecurity and other socio-economic shocks. The most highly affected countries have experienced a slow growth in agricultural productivity and an increase in food insecurity over the last two decades (FAOSTAT, 2004). The impact of HIV on sustainable agriculture and food security needs to be a fundamental concern for governments and their development partners.

2. Understanding Vulnerability

There are two sets of external factors which exert a significant influence on households and their livelihoods. These include the 'Policy Processes and Structures' and

the 'Vulnerability Context'. Policy Processes and Structures include factors such as the legal environment, culture and institutions within society, which affect the way people use and accumulate their assets. The Vulnerability Context refers to the ways through which internal and external shocks and trends affect asset levels. The definition of vulnerability often contains two components: **external vulnerability**, which refers to exposure to shocks or hazards; and **internal vulnerability**, which refers to the capacity to cope with or withstand those shocks. It is the combination of these factors that influences the livelihood strategies that people pursue, and ultimately their livelihood outcomes (including income levels and food security).

The use of the term 'vulnerability' as an absolute status - for example by simply describing chronically ill or female-headed households or orphans as vulnerable groups - should be avoided. Vulnerability is not necessarily synonymous with need. Orphans are vulnerable if their education, food security, or other livelihood status is threatened and not merely by being orphaned.

3. Impact of HIV and AIDS on the Household

Across all countries in southern Africa, the HIV epidemic has accelerated rural impoverishment. The epidemic has led to the breakdown of extended family relations, which have been the foundation of traditional safety net mechanisms (Drinkwater, 2003). The HIV epidemic has also altered the structure and composition of households by affecting the most socially and economically productive members. It is increasingly the grandparents, who have retired from active production; and the children, who now head households. Both lack the capacity and resources.

The reduction in productive labour sets into motion several factors that are detrimental to the overall welfare of a household. As healthy adults allocate part of their labour time to nurse and care for those who are ill, the labour shortage compels people to switch to less labour intensive crops, which usually tend to be less nutritious. Morbidity due to HIV and AIDS accelerates with decreased nutrition. Children drop out of school to provide the badly needed household and agricultural labour.

During chronic illness, the main effects are loss of labour due to illness, loss of labour due to increased caring and increased requirements for spending on healthcare. Death leads to an immediate loss of labour, but can lead to other changes in household composition that can affect labour availability - positively or negatively. There can be changes in livelihood patterns as remaining members try to optimise their available assets. This can lead to successful coping, or a period of unsustainable response (e.g. by selling productive assets), which could ultimately result in the dissolution of the household. The economic effects of taking in an orphan depend on the existing composition of the household and then on the age, gender and skills of the incoming orphan, which determine the net contribution of the orphan to the household.

Although the impact of HIV and AIDS has been severe throughout southern Africa, researchers have not fully explored and agreed on the extent and nature of the epidemic's influence on food security. The observed impact on food security varies between households because HIV is a complex epidemic and because households are diverse – even within one community. De Waal and Tumushabe (2003) highlighted that the overall importance of labour in a household's livelihood system, increases the extent to which HIV and AIDS impacts on the household. HIV affect the household in three stages -

during chronic illness, at death, and after death. If a member dies of AIDS, a household is likely to experience emotional and physical loss, but if the member is the primary income earner, the household is likely to experience a substantial economic loss.

Impact of Chronic Illness

The period of chronic illness of an adult can place acute stress on household livelihoods. When one member of the family is chronically ill, other household members tend to divert energy and resources away from agriculture and food production to provide care, support and treatment. This is due to three main problems:

1. **Reduced available income** within the household, as the ill person is often unable to work,
2. **More time allocated to caring -** other household members are required to spend time caring for the ill person as opposed to agriculture and food production. The carer may be a child, typically a girl child, which means the time spent on care can take her away from her education. The potential loss of income at this stage can make households food insecure and seriously compromise children's rights.
3. **Greater spending on healthcare and associated costs** - savings and assets can become depleted when caring for the ill person.

Depending on the existing level of food security in the household, this can mean spending shifts from other household needs to healthcare. In addition, the household may sell assets to raise extra cash. Within already poor households, options may be significantly limited such that the difficult decision to forego such spending on healthcare is made, to maximise the welfare of remaining members.

Dynamics of HIV and AIDS impact on a household involved in an agriculture-based livelihood

The following is an illustration of possible impacts and responses on an agriculture-dependent household containing an adult who contracts HIV and develop AIDS. Many of these impacts have been shown in studies; some are speculative, albeit plausible. Context is crucial with regard to type and sequencing of impacts and responses at different stages of the epidemic.

- Adult becomes sick
- S/he reduces work
- Replacement labour is "imported", perhaps from relatives
- Health care expenses rise (drugs, transport)
- Household food consumption is reduced
- There is a switch to labour-extensive crops and farming systems, small livestock
- Adult stops work
- Increased care given to sick adult, with less time for child care
- Debts increase
- Children drop out of school to help with household labour
- Adult dies
- Funeral expenses incurred
- Household may fragment as other adults migrate for work
- Cultivation of land is reduced, more land left fallow
- Inappropriate natural resources management may lead to increased spread of pests and disease
- Effects of knowledge loss intensify
- Increased mining of common property resources
- Access to household land and property may be affected (re: rights of surviving widow and/or children)
- Solidarity networks strained, possibly to points of exclusion
- Partner becomes sick
- Downward spiral accelerates

Impact of Death

The death of an adult can have a mixed set of effects; for example, the contribution to agricultural production and income from that member is lost. Then, there are immediate costs, in terms of the funeral, and potentially the loss of assets for widows and orphans, where inheritance practices leave them without entitlements. Compared to the pre-illness phase they will certainly be in a more difficult circumstance. Healthcare costs and caring requirements may be reduced. However, in the case of HIV, often other family members (the widow, widower, or young children), may be infected. Hence the costs for care and treatment continue. If the deceased individual owned businesses or employed others, their death can affect the community through reduced employment.

It takes time for the full impact of the loss of a household member to become apparent, as the household undergoes significant transformation at this point. The age, gender, status or position of the deceased individual influences the extent of the impact. In Zambia, the death of a male head of household often leads to household disintegration, as the family moves to maternal relatives. Yamano and Jayne (2004) highlighted the various ways that household composition is affected by adult mortality, and how the effects vary according to the gender and status of the adult who has died. The death of one family member can change the household composition. For example, an older girl child may leave the household to get married, or additional relatives may return to the household to provide support. Remaining productive members may change their livelihood strategies to optimise the opportunities available to them. While the situation for some stabilises at a point where they can more or less provide for their families, other households may descend into a downward spiral of poverty that ultimately results in the dissolution of the household.

In the short term, a household may appear to be accessing sufficient food, but it may be doing so through unsustainable activities, such as selling off livestock and productive assets to buy food. It is necessary to clarify whether a household is 'coping' in a successful and sustainable way, or 'struggling' (Rugalema, 2000; Baylies, 2002). Therefore, assessments of impact should try to understand where the household is, with respect to responding and adapting to their situation; and in what direction they are heading, as opposed to simply taking a snapshot within a particular time-period.

The research on this subject can often simplify the situation by focusing on changes that occur in a limited range of household activities before and after death, and not considering the overall results for the food security of the household. For example, one may monitor changes in farming and agricultural production. Many studies have highlighted a decline in agricultural production following an adult death, and implied that this is a direct link to a drop in household food security. However, a household determines the activities undertaken based on the total range of assets, skills and opportunities available to them. A household may choose to switch from agricultural production to some other form of income-generation, which could at least partially compensate for the loss of crop production. Petty et. al (2004) described cases in Mozambique where women switched from agricultural production to petty trading activities, while a child-headed household was coping by renting out an unused hut.

Effect of Supporting Orphans

The third context in which HIV and AIDS impacts on a household, is the care and support for orphans. There has been a tendency to simplify the likely outcome by suggesting that taking in orphans adds to the burden of the household. Often, it is assumed that an already limited income is stretched by having to

support an additional dependent. However, in reality, there can be a wide variety of outcomes depending on both the status of the orphan and the status of the host family.

There is no clear pattern to determine the type of household that hosts orphans. HIV affects all types of households and households across a wide spectrum of wealth ranks take in orphans. However, wealthier host families are more likely to be able to take in additional family members without jeopardising their food security. Yet in reality the majority of orphans are adopted by poorer families.

On their own, the demographic characteristics of the household are not necessarily reliable indicators of food security. There is often concern that elderly-headed households or female-headed households will be 'vulnerable' in the first place, and that adding orphans into the picture will only exacerbate the situation. This is certainly true where the caregiver has limited income or marketable skills and the orphan is too young to help provide for the family. Although empirical research has shown that there are usually proportionately greater numbers of elderly-headed and female-headed households who are food insecure, this does not imply that all such households are food insecure. For example, the rural survey conducted by Zimbabwe's Vulnerability Assessment Committee (VAC) (2003) highlighted the problem of focusing on demographic characteristics. The assessment found that 74% of households headed by elderly females and hosting orphans, were unable to meet their minimum food needs. However it also found that 48% of non-elderly adult male-headed households without orphans were food insecure. While this is a significant difference, it highlights the danger in assuming that certain categories of people are automatically food secure or insecure, a common error in targeting.

The age, gender and skills of the orphans themselves will affect the food security of the host household. Younger children are more likely to place a greater strain on the household, both in terms of the costs of care requirements and material needs. Older children, on the other hand, may add to the household's net economic benefit, if they are working and contributing to household income or food production. However, it is important to assess whether this contribution is not being exploited at the cost of their education. The SADC-FANR VAC, 2003, found that orphan-hood had a much more ambiguous relationship with food security outcomes than other proxies.

4. Impact on Household Economics

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

HIV and AIDS directly affect household livelihood through their negative effect on labour productivity and on the number of effective workdays of family members. Family members who spend time attending to the sick have less time for leisure or other productive activities. When an ailing family member engages in casual wage employment, a reduction in productivity and increased absenteeism from work, translates into income loss. The impact of declining productivity of family members in the civil service and middle management positions may not necessarily result in fewer earnings, as their employment contracts are not based on output. Agricultural households, which typically combine off-

farm wage employment of some family members with on-farm engagement of the rest of the family members in agriculture, suffer double effects from the impacts of HIV and AIDS on family labour. Spouses in rural households are often exposed to higher risk of contracting HIV if their partners are employed elesewhere and stay long periods away from the household. For these households, the benefits of paid employment come attached with the associated risk of contracting HIV.

Effect on Paid Employment

Economic theory of labour suggests that earnings from formal employment depend on the average productivity of the workers. In reality, institutions are rigid and wages are negotiated by workers' unions. Only casual and unskilled labourers are paid according to individual productivity and the number of days worked. For firms with a fixed labour force, morbidity and absenteeism as a result of HIV and AIDS lead to reduced productivity, although this does not translate to a reduced wage bill in the short term as workers are protected by their unions from loss of income.

Effect on Family Labour

For purely subsistence grass-root households, the impact of the HIV epidemic may be felt more directly. The decreased productivity of a family member and/or absenteeism from on-farm and off-farm income earning activities is felt especially when the household has a pressing labour bottleneck. However, the literature is divided on the extent to which a grass-roots household is affected.

There are some suggestions that the grass-roots sector may not be as sensitive to an HIV induced decline in supply and productivity of family labour as is often assumed. The effects of HIV on agricultural production labour in rural communities is insignificant, where the household has surplus labour. This is not the case for households that experience seasonal labour shortages. Even in cases where household enterprises are sensitive to labour supply, the effect on the overall income depends on the extent to which the household is able to adapt its farming system. For example, substitution of capital or land for labour can result in dramatic changes to the farming system, thereby minimising the impact of the initial shock. Thus, the extent to which households are able to undertake economic adjustment of technology and enterprise mix is a key determinant of the overall impact of HIV on household income performance.

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

Like any other ailment, HIV takes a financial toll on the family budget, thus, limiting the ability of the household to acquire agricultural technologies such as hybrid seed and fertiliser. Sometimes families are forced to sell capital assets (bicycle, ploughs, oxen, and cows), without which the household is left operating from a much lower productivity base.

Evidence from empirical surveys such as Mutangadura et. al (1999), indicate increased incidence of sales of productive agricultural assets among families caring for male heads of households. This implies that rural women often experience deepened productivity losses

and chronic poverty following the death of a partner. This is mainly due to excessive sacrifices for the high cost of care and funeral expenses, leading to the disposal of family assets. Further, loss of assets associated with customary inheritance practices leaves the surviving family poor and unable to sustain its pre-death food security status.

In addition, the increased frequency of burials impacts on agriculture as culturally, agricultural activities come to a halt to observe the mourning period.

Effects on income and expenditure

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

Among households affected by deaths, funeral costs were substantially higher than health care costs. Relatively few households reported lost income due to illness or death. However, this may reflect chronically ill or dying people having been unemployed for some time.

Most households indicated that they responded to financial crises by borrowing, followed by using savings and sale of assets. Coping financially in these ways was also more likely in rural than in urban areas. Very few households experiencing a recent death had received a lump-sum payment or inheritance following death.

5. Impact of HIV and AIDS on Household Food Security

Food security is the availability of and access to food, as well as the absence of risk related to either availability or access. According to Barnett and Rugamela (2001), households are said to be food secure if four factors are in balance: food availability, equal access to food, stability of food supplies and quality of food. The impact of HIV affects all these factors individually and has therefore been identified as having a key role in the reduction of household food security throughout southern Africa.

Food security became a prominent developmental issue in the 1970s. Maxwell and Frankenberger (1992) identified thirty definitions of food security. Originally, there was a tendency to understand the issue of food security only from a supply point of view. In 1979, the World Food Programme Report conceptualised food security, equating it with an "assurance of supplies and a balanced supply-demand situation of stable foods in the international market". The report also emphasised that increasing food production in developing countries would be the basis on which to build their food security. This would mean that the monitoring by early-warning systems for famine and food insecurity should focus on the availability of food in the world market, and on the food production systems of developing countries. However, global food availability does not ensure food security to any particular country. Thus, there are countries, regions within countries, villages within regions, households within villages and individuals within households, that are not able to meet their food needs. The paradox

is that global food security exists alongside individual food insecurity (Odenya, 2003).

Odenya (2003) further argued that an increase in national food production does not guarantee food security. Availability of food at the national level is but one factor of food security. Supporters of this view try to work out a food balance sheet for a given country and if food availability is equal to the food needs of the country's population in general, they conclude that the country is food-secure. Given this perspective of food security, the basis for famine early warning would then be monitoring of food production at the national level and may not take into consideration other relevant social, political and cultural factors, which may limit access to food.

In this perspective, the underlying assumption is that whatever food is produced in the country will be evenly distributed to each region and to each household. In reality, this is not the case. Many people do not have enough money to buy food on the market and national governments often lack financial resources to provide food for the poor. Hence, food availability at the national level does not necessarily provide food entitlement to households and individuals.

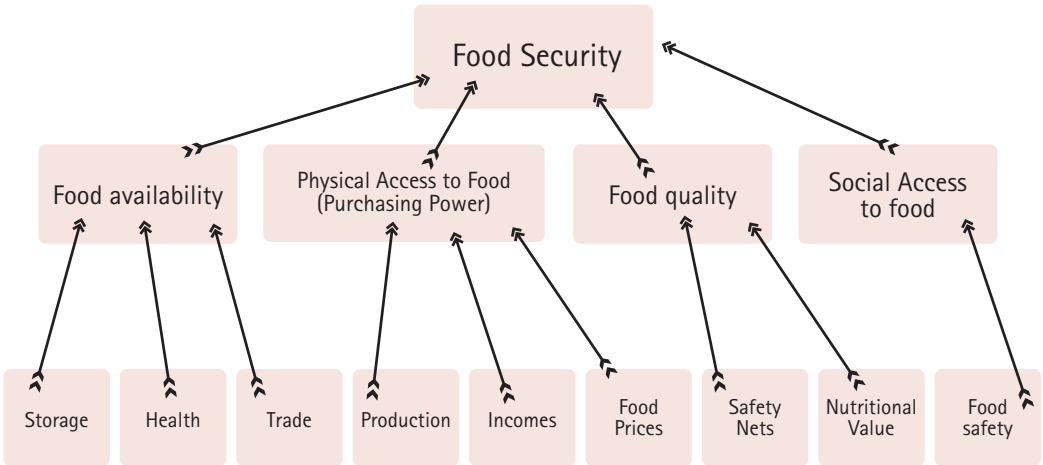
At the household level, Eide quoted in Maxwell and Frankenberger (1992) has defined food security as access to adequate food by households over time. This implies that each member of the household is secure if the household in general has access to food. However, in reality food may not be easily accessible to all members of the household. Maxwell and Frankenberger argued that it was misleading to assume that household members shared common preferences with regard to (a) the allocation of resources for income generation and food acquisition, or (b) the distribution of income and food within the household. The head of the household may have more power in determining the use of food resources and may misappropriate it. Moreover, household members' nutritional requirements may vary, as in cases where they exert more energy through their work. Cultural factors can also deprive members of the household like women and children from getting an equitable share. Hence, the concept of household level food availability in general, does not fit into the accepted definition of food security.

Staatz (1990) defined food security as the ability of the food system to guarantee that the whole population has access to a timely, reliable and nutritionally adequate supply of food on a long-term basis. According to the World Food Summit (1996), food security exists when all people, at all times have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has been interpreted broadly to include availability, access and utilisation of food (see figure 1.1).

Drinkwater (2003) maintained that, *'Food security has conventionally focused on households' access to food and income they require for survival on an inter- and intra-seasonal basis. If nutritional security is entertained additionally as a concept, then food security relates to the pathway of food into the household, and nutritional security to the nutritional outcomes, once the internal factors related to storage, preparation, distribution, health and mother care, have been taken into account'.*

Food can be produced or purchased. By affecting the most economically productive member, HIV and AIDS reduce the available income and labour required to produce and purchase food. They also deplete the household's overall assets, income and skills (Barnett & Rugalema, 2001). Mutangadura et. al (1999) emphasise that the major impact of the disease on agriculture includes serious depletion of human resources, diversion

Figure 1.1: Flow Chart showing food security and its components



Source: Rugube, 2003

of capital from agriculture, loss of farm and non-farm income and other psychosocial impacts that affect productivity. The loss of adult on- and off-farm labour is one of the most widely discussed effects of the HIV epidemic (Topouzis & du Guerny, 1999). HIV result in the loss of experienced agricultural workers which affects both individual households and communities, resulting in labour shortages and declines in productivity both on and off the farm.

According to Odenya (2003), labour shortages, the need for cash for medical expenses to cover funeral costs, the slaughter of animals for funeral rites, and the loss of knowledge and management skills, may result in livestock loss. Without ample financial resources, HIV affected households have less money available to pay for livestock care (for example, veterinary drugs, feeds etc) and lose more livestock due to illness. A decline in productivity leads to declines in household income, through decreases in the household's own production and declines in off-farm income and remittances, which can result in the household being less food secure.

Dependency Ratio and Food Security

AIDS-related morbidity and mortality usually result in a rise in the number of dependants within a household who rely on a smaller number of productive family members (Topouzis, 1998). The death of young adults affects food access by increasing the number of orphans, thus raising the dependency ratio within a household. This undermines household food security and requires changes in roles, and responsibilities, as well as relations among household members. For example, because of HIV, elderly women are resuming the role of custodians of food security, in addition to parenting their grandchildren, instead of receiving support from their children. The other extreme is that there is an increase in child-headed households, where young boys and girls find themselves having to provide and care for their younger siblings. Thus, HIV further threaten food security by eroding social security networks, an important asset.

[1] These include Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia and Zimbabwe (where prevalence exceeds 20 percent), and Malawi and Mozambique (where prevalence exceeds 10 percent).

6. Impact of HIV and AIDS on Agriculture

As in other business sectors, it is expected that HIV would also have a severe impact on the agricultural sector. However, to date, the extent of the impact is not clear. Based on demographic projections in eastern and southern African countries where HIV prevalence is highest[1] (exceeding 10 percent) US Census Bureau, 2003, cited by Jayne, Villarreal, Pingali & Hemrich, 2004, predicts that HIV and AIDS are likely to have the following effects on the agricultural sector:

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

Jayne, et. al (2004), grouped the effects of HIV on agriculture in the rural household (and, by implication, on household food security), according to three categories namely, (1) effects on agricultural production and productivity, (2) effects on crop cultivation and production systems, and (3) effects on land distribution. The following section explores these three categories as well as the effects on livestock and household assets and the effect on agricultural extension services.

Effects on agricultural production and productivity

Studies conducted in Africa in the late 1990s found that rural households experiencing adult mortality showed a decline in agricultural production, in comparison to non-affected households. Statistically, this result was significant in the cases where the head of the household was male (Yamano & Jayne, 2004). Other studies conducted in East Africa show that affected households were able to compensate in part for the death of a household member, by recalling another member residing off the farm. This would partially stabilise the supply of agricultural labour to the household, although this happened at the expense of off-farm remittances and therefore put pressure on household capital endowments (Ainsworth, Ghosh & Semali, 1995). As expected, the effects of the epidemic on households that were initially poor were most severe (Drimie, 2002; Yamano & Jayne, 2004).

A serious implication of agricultural decline is reduced food security, for families involved directly in agriculture as well as for urban populations reliant on purchasing food. Thomson and Metz, (1997), rightly noted that the main causes of food insecurity are low productivity in agriculture combined with fluctuations in food supply, low incomes, insecure livelihoods and shocks from asset loss (for example the death of livestock), war, theft and civil conflict, and more recently, HIV. This analysis also applies to the impact of HIV on household food availability and access to food. AIDS-related morbidity and mortality have a detrimental impact on the productive capacity of rural households. This is typically felt on at least three parameters, namely, labour quality and quantity, income and expenditures and the dependency ratio.

Effects on crop cultivation and production systems

Some studies reviewed by Jayne, et. al (2004), have documented a trend whereby a change in production systems (from commercial to subsistence crops) has occurred, possibly due to HIV. The explanation of this

phenomenon is based on observations that suggest that capital constraints would become more severe as HIV affects households, forcing many households to adopt less capital-intensive technologies and crops. The results have, however, been mixed as to how the epidemic is affecting household agricultural systems.

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

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

Effects on Livestock and Household Assets

The interest in HIV's impact on livestock is prompted by the recognition that livestock provides draught power for agricultural production. In addition, it provides food security to households in the form of milk, meat and meat products. In some areas cow dug is used for energy and as building material. With the exception of China, it is estimated that animal draught power is used to cultivate 52 per cent of arable land in developing countries.

A Food and Agricultural Organisation (FAO) sponsored study investigated the impact of HIV on the livestock sector in Namibia (Engh and du Guerny, 2000). In that study, semi-structured informal interviews were used to collect data from representatives of Farmer Extension Development (FED), and members of households that were identified as affected by HIV-related sickness or death. The survey covered 24 FEDs and 22 affected households. The findings showed that HIV affected agricultural labour both quantitatively (because of the deaths of productive members of households) and qualitatively (as agricultural production shifts to the elderly and children). Mourning and attending funerals were found to be both time and energy consuming. In Tanzania, as is the case in other African countries such as Botswana, every member of the community is obliged to attend a funeral lest they are ostracised (Tibaijuka, 1997).

In the Namibian study, households were further classified into i) household where husband died, ii) household where wife died and, iii) household where both husband and wife died. The typology of a household was found to be associated with the impact of HIV on livestock ownership. In some patriarchal cultures, the study found that a household lost inheritance to the husband's relatives upon his death. When it comes to household assets, the study indicated that HIV depletes the asset base of mainly female headed households. These may be forced to sell their animals to generate income for treatment, or they may sell because livestock husbandry is considered to be a "male" activity. A study in Rakai district of Uganda reported that within four years, the cattle population in the district had reduced by 32% (Haslwimmer, 1999).

Effects on Land Distribution

According to Jayne et. al (2004), as affected households lose members in their prime, including those possessing rights to their household land, conflicts over inheritance may occur (citing Barnett & Blakie, 1992). Poor, disadvantaged and vulnerable households (consisting of orphans and widows) are more susceptible to losing access or ownership rights after the husband or father

passes away. In such a scenario, land ownership will tend to become more concentrated in wealthier households (those who are able to maintain their land rights after experiencing a prime-age death) in the long term (see also Drimie, 2003).

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

Effect on Agricultural workers

FAO (2001) has estimated that since 1985, some 7 million agricultural workers have died from AIDS-related diseases in 27 severely affected African countries. An estimated 16 million more deaths, are reported likely in the next two decades. The anticipated labour loss in SADC is estimated between 12.7 and 26.0%. The impact of HIV on agricultural extension workers has also made these services less able to respond and support farmer needs.

In a Namibian study, Engh and du Guerny (2000) showed that the extension staff was affected since 10 per cent of their time was spent attending funerals. Haslwimmer (cited in Gillepsie and Kadiyala, 2005) observed a 25 – 50 percent reduction in agricultural time. In addition, 67 percent of extension staff interviewed had lost a co-worker in Zambia; 50 percent of extension staff were lost to HIV in Uganda; and 16 percent of Ministry of Agriculture and Irrigation staff were living with HIV in Malawi in 1998 (Alleyne et. al.; Haslwimmer; Bota et. al.; cited in Gillepsie and Kadiyala, 2005).

Agricultural Labour Quality and Quantity

Smallholder and subsistence agriculture are the main source of livelihood for millions of African families (Jackson, 2002). The impact of AIDS can be extreme, since most households lack safety nets to cope with greatly reduced labour availability. As labour availability declines, families resort to less labour intensive cropping and reduced areas of cultivation. Livestock management tends to become less competent, resulting in greater losses and sometimes, a switch to goats, chickens, and fewer cattle. The passing on of traditional farming methods and skills has declined along with competence in farming, which is similar to the loss of institutional memory and experience in a formal enterprise.

The sugar industry in Swaziland has a high HIV prevalence. A study on the impact of HIV was commisioned on the largest sugar estate, with 3,295 employees. The sugar industry offers comprehensive benefits, including free health care, housing, water, gas and electricity and subsidised education and social services. In addition, employment benefits include death benefits, group life insurance, disability insurance and a pension scheme. Thus, HIV could be extremely costly, particularly as the majority of those dying of AIDS are not retired on the grounds of ill health but are still classed as employees.

The study found that AIDS had contributed significantly to deaths between 1995 and 1999. Overall, AIDS accounted for just over half of all deaths, but the proportion was increasing significantly with time and could be presumed to continue to rise. In addition, the costs to the company associated with an AIDS death as opposed to a non-AIDS death were higher.

A SAfAIDS publication (Mutangadura et. al [eds.], 1999) brings together a range of research looking at the impact of AIDS on farming in Southern Africa, and in particular, the implications for technological change. Mutangadura et. al (1999) noted that agricultural extension services would be hard hit by AIDS – related ill health and death, making them less able to respond effectively to the changing composition and needs of their target farmers. Further, in particularly impoverished rural areas, most families have limited safety margins for problems such as crop failure or chronic ill health. The savings and assets they have are most likely to be spent on the immediate needs of dying family members. Women and children are particularly vulnerable, having to take over traditional male roles when men die, as well as fulfilling their traditional roles.

Households' on-and off-farm labour quality and quantity may be reduced, first in terms of productivity, when HIV-infected persons fall sick, and later, when the supply of household labour declines because of patient care and death. Case studies in Tanzania have estimated that households lose around two years of labour by the time of death (Rugalema, 1998). Odenya (2003) argued that this burden falls mainly on women, who are also the main food producers in sub-Saharan Africa, accounting for 70% of the agricultural labour force and 80% of food production in Africa. The impact of HIV and AIDS morbidity and mortality affects labour inputs and productivity affects women (Topouzis, 1994). Labour shortages and labour loss on subsistence farms contribute to food insecurity.

Effects on area planted - Effects on area planted can be examined in two ways: 1). for a given household, differences in area planted from one year to the next and 2). differences between households in area planted for a specified year. The general effect is a reduction in land area under cultivation. Fields may be under-utilised or left fallow because a young adult is physically unable to work on the farm or a grandparent is chronically ill or too frail to make up for the labour loss. According to one estimate, approximately two people–years of labour are lost by the time one person dies of AIDS, due to their weakening and the time others spend giving care (Committee on World Food Security, 2001). In Tanzania, researchers found that women spent 60% less time on agricultural activities, taking care of their ill husbands (Committee on World Food Security, 2001). Brown, et. al (1994), argued that subsistence farm households that are heavily reliant on labour as their sole resource, (such as female-headed households) are particularly affected by HIV and AIDS. This is because factors that diminish labour also diminish food security and increase poverty.

A reduction in ability to control pests - Weeding and other inter-cultivation measures may be neglected because of labour/input shortages.

Loss of soil fertility - Some families may abandon traditional practices, such as mulching, which replenish the soil, or else sell animals, which provide manure, thus reducing soil fertility in their fields.

A decline in the range of crops grown per household - Labour shortages and the loss of agricultural knowledge (resulting from skilled and experienced employees) may force AIDS-affected families to reduce the number of crops under cultivation. As a result, food supplies are less varied causing a negative impact on the nutritional quality of the diet. For example, these staple crops may be high in carbohydrates but low in protein and thus, nutritionally inadequate (Odenya, 2003).

Effect on cropping patterns - HIV and AIDS result in changes in cropping patterns and a shift from cash crops to subsistence food production or crops that have shorter growing seasons. Some families may shift to less labour-intensive crops or to crops that require less capital inputs due to lack of cash to buy seeds, tools and other inputs.

Jackson (2002) argued that on large-scale commercial farms and estates, unskilled labour is readily replaceable and therefore poses little threat to the industry regarding recruitment, but increased morbidity and death can mean increased benefits paid out to employees. Studies of the sugar industry in Swaziland and South Africa (AIDS Analysis Africa, 2000/01; Morris and Cheevers, 2000) and by Barnett (1994) in Zambia, Uganda and Tanzania, suggest that the increased costs and loss of productivity are manageable. Indeed, the South African study indicates that the cost of inaction is greater than the cost of HIV prevention and care efforts. The recommendation is therefore that the farm and estate owners and managers mount effective HIV prevention and support programmes for reasons of enlightened self-interest, as well as out of humanitarian concerns.

7. Impact of HIV and AIDS on Women in Agriculture

Women are highly vulnerable to the HIV epidemic and the disease is affecting women and girls in increasing numbers. According to Marita Eibl and Valerie Foster (2002), women are fast becoming the predominant group infected and affected by HIV and in Sub Saharan Africa. Women have a higher number of new HIV & AIDS cases than men. In Zimbabwe, 53% of all the people in the smallholder agricultural sector are women and children (Census, 1992 Zimbabwe National Report, CSO).

HIV compounds the existing gender discrimination (De Bruyn, 1992). They concluded that women are especially vulnerable to HIV because they have more vulnerable employment status dependent on labour intensive activities, lower incomes, least access to formal social security and least entitlements to, or ownership of, assets and savings.

Traditionally, rural women have always had a triple role to play in society. These roles are differentiated as reproductive, productive and community roles. Women usually also assume care-giving roles in their families and through community home-based care (CHBC). CHBC is generally holistic care that offers treatment and psychosocial support to patients, as well as support to careers and relatives, including orphaned children. A study done in Kagabiro village in Tanzania revealed that when a household included someone with AIDS, 29% of the household labour was spent on AIDS-related matters. In two thirds of the cases, women were devoted to nursing duties and on average, the total labour that was lost to households was 43%. This affects yields since labour and time that would otherwise have been used productively in the fields or doing agricultural work is transferred to caring for the sick. The advent of HIV has further expanded this role, as women are required or expected to take care of those who are sick with AIDS-related illnesses. Women play this role both in the households, and in the community. Usually women volunteer to provide care, which includes basic nursing care, palliative care and care for orphans. Women perform these care giving roles as individuals or as groups, often working without pay. They work as volunteers through churches, local CBOs, NGOs as well as government initiatives (UNAIDS, 2003).

8. The New Variant Famine: Link between agriculture, food security and HIV/AIDS

Do HIV and AIDS cause famine? De Wall and Whiteside have proposed a "New Variant Famine" hypothesis in which hunger and HIV and AIDS reinforce each other with catastrophic consequences (De Wall & Whiteside, 2003). They argue that unlike the "traditional or pre-AIDS famines" –the "AIDS-induced famine" or what they refer to as the "New Variant Famine" is likely to radically alter household dependency ratios. Traditional famines affect the weakest first – the children and the elderly – who are usually dependents. Households and communities are much better adapted for survival when the dependency ratio does not increase substantially. In such cases, coping is possible.

The 2001-03 Southern Africa food crises generated two key questions;

1) How do HIV and AIDS contribute to food crises?
2) What does this imply to the type of responses that are required?

The physical environment and climate were considered the immediate triggers of this crisis. Flooding and poorly distributed rainfall in the first half of 2001 led to a reduction in food production across the five most severely affected countries. Multiple overlapping factors exacerbated these impacts: deep and widespread poverty, civil strife and insecurity about land, removal of price controls, erosion of agricultural diversity, poor governance, and repression of the press and civil society (Loevinson & Gillespie, 2003). One factor that was more significant in this crisis than in past crises was HIV and AIDS. The Southern Africa region, which was affected by the 2001-03 food crises has also experienced the highest rates of HIV and AIDS in the world. The region is also home to the highest rates of poverty and malnutrition.

The HIV and AIDS induced famine is predicted to be different because it affects the strongest, able-bodied and most productive members of the household. People who were infected before a food crisis will die more quickly as drought exacerbates their already worsening nutritional status. As a result, the dependency ratio may rise significantly. If the sick and dying parents are also counted as dependants (and appropriately so), the effective dependency ratio will become even higher. This increase will have particularly severe consequences for women, who already have greater total work burdens (domestic and external) and yet are more vulnerable than men to HIV infection.

Dependency is further worsened by the trend for HIV-positive adults who return to die in their villages, thereby placing a "double burden of care" on rural households. By Sen's (1981) reasoning, such heightened dependency ratios, alone, will increase the risk of collapse of a household's entitlement set – both endowments and exchange entitlement. A high prevalence of HIV and AIDS is likely, therefore, to increase both the 'upstream susceptibility' and the 'downstream vulnerability' to the famine.

Resilience – the ability to bounce back or recover – is likely to be seriously affected. A common early coping strategy is to fall back on the family network, but in high HIV prevalence areas, this may already be under extreme pressure. The next fall back is on labour power – again not a viable option for AIDS afflicted households. Even the gathering of wild foods requires knowledge gained over the years and passed down from parents to children – life saving knowledge that will now die with the parents.

Reducing food consumption is not likely to be a survival strategy for many AIDS-afflicted households – this would most certainly hasten death. One of the last resorts, often irreversible, is to sell major assets, such as land and livestock, a step that seriously increases the risk of destitution and starvation. In addition, one of the most insidious aspects of the HIV epidemic is that the last option left for a woman may be to trade sex for cash to feed her children. In the last option – "severe vulnerability" has led to extreme susceptibility.

Hence, if the "new variant famines" are hypothesised as being qualitatively and quantitatively different from the "traditional" famines – then they demand qualitatively and quantitatively different responses. Here it is worth looking at the disaster theory. Wisner et. al (2004), convincingly argue that disasters should not be regarded as separate from everyday living – because the risks involved in disasters are connected with "normal" vulnerabilities. They are as much a product of social, political and economic environments as of nature.

According to the "pressure-and-release" model, a disaster occurs at the intersection of two opposing forces: "processes generating vulnerability" on one side and "natural hazards" on the other. The level of risk is, thus, a compound function of the severity of the natural hazard and the number of people vulnerable, in varying degrees, to that specific hazard i.e. [**Risk = Hazard x Vulnerability**].

Pressure is thus exerted from both sides. "Release" may come through a reduction of vulnerabilities, which reduces the "pressure". As Wisner et. al (2004), pointed out, the "New Variant Famine" hypothesis is compatible with the "pressure-and release" model. What is distinctive about HIV and AIDS in this context is that the epidemic can exert influence on "both" sides. With increasing prevalence, the impact of HIV grows, and vulnerabilities increase. The HIV epidemic has been described as a slower-onset disaster (Wisner et. al, 2004). Unlike a flood, the HIV hazard will be around for a long while to come.

Although it is not yet certain "when" or "where" the "New Variant Famine" scenarios will play out, they remain entirely plausible (Gillespie & Kadiyala, 2005). However, these food crises do not develop "out of the blue". They are derived from the impact of the epidemic on food security and other processes that compound the vulnerabilities of households and communities. The dichotomy between "development programmes" and "humanitarian programmes" is a false one in the context of HIV and AIDS. The United Nations is now speaking the language of "emergency development" or "development relief".

The FANRPAN Regional Study

To explore the impact of HIV and AIDS on agriculture and food security in the SADC region, the Food, Agriculture, Natural Resources Policy Analysis Network (FANRPAN) conducted a study in seven southern African countries: Botswana, Lesotho, Namibia, Swaziland, South Africa, Zambia and Zimbabwe. From 2003 to 2005, FANRPAN worked with in-country research teams to examine the demographic characteristics of households affected by HIV and AIDS. Data was collected on food and agricultural production, employment, savings and investment. Throughout the research, FANRPAN sought to identify and account for the complex social, cultural, political and economic environment in which individuals construct their livelihood.