

**Home gardening as a mitigation measure for food security of HIV/AIDS affected
households in Mpophomeni Township, KwaZulu-Natal**

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ABSTRACT

HIV/AIDS has depleted the livelihood assets of many households and as such caused them to sink deeper into poverty. Due to the socio-economic impact of the epidemic, communities on their own or facilitated by outside agencies are coming up with mitigation strategies to minimise the impact. Home gardening is one activity being used by government and non-governmental organisations to create self-reliance and independency among affected households.

This study examined the impact of home gardening on the food security status of HIV/AIDS affected households in the Mpophomeni Township of KwaZulu-Natal. A survey was conducted among 23 home gardeners and 10 representative households without home gardens. Data was collected using a questionnaire, focus group discussions and through interviews with key informants. Using the Household Food Insecurity Access Scale (HFIAS), 4.3% were food secure, 21.7% were mildly food insecure, 39.1% were moderately food insecure while 34.8 were severely food insecure among households with home gardens. The severely food insecure household were those who often would go for a day without eating, go to bed hungry or run out of food for more than ten days a month.

A regression was used to determine the factors influencing the HFIAS score. The results of the analysis show that out of the six variables included in the regression model, five variables were statistically significant. These are level of education of the head of household, size of household, household monthly income, monthly food expenditure and participation in home gardening. The age of the head of household showed no significance in affecting the HFIAS score. T-tests were used to compare the food consumption score (FCS) and HFIAS score means of home gardeners and non-gardeners and there was no significant difference between

their means for both scores. This implied that home gardens are not making a significant impact on the consumption score and food security status of home gardeners.

Limited home garden sizes and vagaries of nature such as hailstorms, frost, pest and diseases were identified as factors limiting productivity of home gardens. The study recommended that the use of appropriate crop production methods such as improved seeds, inorganic and organic fertilisers and adequate pest and disease control will improve home garden productivity.

DECLARATION

I, Kudzai Esther Makwangudze hereby declare that:

- The research presented in this dissertation, except where otherwise indicated, is my own original work and has not been submitted to any other university.
- This dissertation does not contain data or information from other persons' work, unless specifically acknowledged as being sourced from those persons.
- This dissertation, unless specifically acknowledged, does not contain other authors' writing and where other written sources have been quoted:
 - their words have been re-written but the general information attributed to them has been referenced, and
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- This dissertation does not contain text, graphics or tables that have been sourced or copied from the internet, unless specifically acknowledged, and expressed in detail in the dissertation and in the reference sections.

Signed K.E. Makwangudze

Date 25/10/13

As Supervisor, I agree to submission of this dissertation for examination.

Signed.....

Date.....

Dr Lloyd J Baiyegunhi

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
CHGA	Commission on HIV/AIDS and Governance in Africa
CSI	Coping Strategies Index
DAPP	Development Aid from People to People
FAO	Food and Agriculture Organisation
GTZ	German Technical Corporation
HBC	Home-based Care
HFIAP	Household Food Insecurity Access Prevalence
HFIAS	Household Food Insecurity Access Score
HIV	Human Immunodeficiency Virus
IGA	Income Generating Activities
KZN	KwaZulu-Natal
NGO	Non-governmental Organisations
PLWHA	People Living With HIV/AIDS
SPSS	Statistical Package for Social Scientists
THBC	Thembaletu Home-based Care
TSB	Transvaal Suiker Beperk

USAID United States Agency for International Development

USD United States Dollar

WFP World Food Programme

CHAPTER 1

INTRODUCTION

1.1 Background

The Human Immunodeficiency Virus /Acquired Immune Disease Syndrome (HIV/AIDS) epidemic is one of the biggest crisis the world is facing (Ladzani, 2009). Although important progress has been achieved in preventing new HIV infections and in lowering the annual number of AIDS related deaths, the number of people living with HIV continues to increase (UNAIDS, 2009). The number of people living with HIV worldwide continued to grow reaching an estimated 33.4 million in 2008. The total number of people living with the virus in 2008 was more than 20% higher than the number in 2000, and the prevalence was roughly threefold higher than in 1990 (UNAIDS, 2009). Sub-Saharan Africa is the region most affected by Human Immune Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) in the world, where one in twenty adults is estimated to be living with HIV/AIDS (UNAIDS, 2009; UNAIDS, 2012a). Southern Africa is the area most affected by the epidemic with South Africa being the country with the largest number of HIV infections (UNAIDS, 2010).

The HIV/AIDS epidemic is affecting all spheres of human activity and performance, in particular their food security. De Waal and Whitehead (2003) have argued that HIV is creating a new variant famine that has struck southern Africa. The emergence of HIV and AIDS has exacerbated the hunger that was previously caused by droughts, famines and wars as it affects the economically active who are breadwinners in their households (Ladzani, 2009). Studies conducted in a number of African and Asian countries suggest that HIV/AIDS morbidity and mortality leads to a loss of productive labour time and reduction of household

income (Haddad and Gillespie, 2001; Stokes, 2003; Commission on HIV/AIDS and Governance in Africa (CHGA), 2004a; CHGA, 2004b). In a preliminary study conducted in Umbumbulu, KwaZulu-Natal, Hendriks and Kiamba (2003) found that morbidity and mortality eroded the resource and asset bases of rural households.

Due to the socio-economic impact of HIV/AIDS, food security has become even more of a priority for households and communities (Kadiyala and Gillespie, 2003). Food insecurity and nutrition are fundamentally interlinked with HIV transmission and the impact of AIDS (FAO, 2003; de Waal and Whitehead, 2003; WHO and FAO, 2002). Studies have shown that food insecurity and malnutrition may increase susceptibility and vulnerability to HIV infection (FAO, 2003; de Waal and Whitehead, 2003; WHO and FAO, 2002). In order to cope with the impact of HIV/AIDS, households have adopted certain response mechanisms that have sunk them deeper into poverty (Rugalema, 2000; van Liere 2002 and de Waal 2002). However, organisations and communities have established programmes to mitigate the impact of HIV/AIDS in an attempt to help affected households recover from HIV/AIDS shock (Donahue and Williamson, 1999).

Agriculture has a crucial role to play in both prevention and mitigation of HIV/AIDS impacts. Agricultural mitigation interventions are crucial for achieving a degree of self sufficiency in households affected by the epidemic. Due to the labour and resource constraints faced by these household, agricultural mitigation interventions suitable for HIV/AIDS affected households should be low input, low-labour demanding, close to the homestead and have a quick turnover and that include safety net support (Nkatiko et al, 2004). Among these programmes is the introduction of home gardening projects and these are aimed at empowering households to be self reliant and food secure (Donahue and Williamson, 1999).

Musotsi et al (2008) state that home gardens provide a direct food source and facilitate a diversity of nutritionally rich foods such as roots, tubers, green leafy vegetables, condiments, nuts, legumes and fruits. Although home gardening is a supplementary food production system and not a primary food source, its use is increasingly becoming popular with households as the size of land for food production continues to reduce (Musotsi et al, 2008). Home gardening does not compete with the household labour availability for agricultural production as most of the activities take place during the off-season, when household labour demand from other agricultural activities is low (Nkatiko et al, 2004).

Measurement of the impact of home gardens on household food security is important in guiding, monitoring and evaluating of these programmes. This study will assess home gardening as a mitigation intervention for households affected by HIV/AIDS in Mpophomeni, a small township in the KwaZulu-Natal province of South Africa. Households within the Masibumbane HIV/AIDS Mission have established homestead gardens and the produce is mainly for household consumption. The contribution of these home gardens to household food security has not previously been measured.

1.2 Motivation and significance of the study

The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimated that in 2009, the total number of persons living with HIV in South Africa was 5.7 million (UNAIDS, 2010). The KwaZulu-Natal (KZN) province had the highest prevalence of HIV/AIDS in South Africa with estimates indicating that 26.4% of its working population was HIV positive compared to 15.9% for the rest of the country in 2008 (Matthews et al, 2008). Unemployment levels and income poverty were also very high in KwaZulu-Natal as compared to the national average with two fifths of the labour force unemployed and one

third of KZN's population living below the poverty line of US\$2 per person per day in 2000 (Thurlow et al, 2009).

As a middle income developing country, South Africa has a per capita income similar to Brazil and Malaysia, but ranks lower than these countries in terms of its Human Development Index (HDI). This is due to the grossly unequal distribution of income, wealth, opportunities and services (World Bank, 2000). South Africa has one of the most unequal income distributions in the world with a Gini coefficient of 0.6 where the experience of majority of South African households is either one of outright poverty or of continued vulnerability to becoming poor or poorer. Approximately 40% of South Africans live in poverty, with the poorest 15% in desperate struggle to survive (Landman et al, 2003).

Food security as defined during the World Food Summit of 1996 “is achieved 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” (FAO, 1996). Food security encompasses four main components namely: availability, access, utilisation and stability. Food availability is measured by the production and supply of food; food access is measured by the entitlements which a household has; food utilisation is measured by nutrition, health and care giving (brings out the importance of non-food inputs in food security) and food stability is measured by access and availability of food to a population all the times (Masuku and Sithole, 2009). This study considered the access aspect using the Household Food Insecurity Access Scale (HFIAS).

HIV/AIDS affected households are more vulnerable to food insecurity than non-affected households because of the impact which HIV/AIDS has on livelihood assets namely: social, financial, human, physical and natural. The introduction of home gardens as a mitigation response aimed at ensuring household food security, but not much research has proved their

sustainability. Promotion of gardening as a nutrition or community development strategy is controversial, with strong advocates and opponents (Marsh, 1998). Critics point to poor project design, management and monitoring, unrealised expectations and lack of sustainability.

1.3 Problem Statement

White and Robinson (2000) stated that HIV/AIDS was understood principally to affect urban areas. However, due to migration the effects are now evident in rural areas as well. Many studies have examined how the HIV/AIDS epidemic has impacted on agrarian livelihoods, providing empirical evidence of how rural livelihoods and food security have been affected by the epidemic. For example, studies in Zimbabwe (Chaminuka et al, 2006) and Limpopo Province of South Africa (Mano et al, 2006) have highlighted that the HIV/AIDS epidemic is affecting the performance of smallholder farmers and, in particular, their food security status due to lack of labour; loss of agricultural expertise to be passed to the next generation if the farmer dies and loss of assets such as livestock sold to cover the medical bills.

HIV/AIDS results in the depletion of household income earning capacity, household savings and assets. Many households move into conditions characterised by poverty, which includes: very little income or wealth, debt and few options for attaining socio-economic security. For example, research in Cote d'Ivoire found that urban household's income dropped by 52-67% in households that experienced an AIDS death (UNAIDS, 1999a). In the same way, evidence from East Africa suggests that households with people living with AIDS have an overall reduction in assets of 40-60% (Mutangadura and Webb 1998). Home gardens are being used to mitigate or help the affected households cope with the shock of HIV/AIDS (Donahue and Williamson, 1999). There is not much literature on the extent to which gardens are improving

the resilience of households. The purpose of this study was to examine the home gardening as a mitigation intervention for food security status of HIV/AIDS affected households in Mpophomeni Township in KwaZulu-Natal.

1.4 Sub-problems

The study problem was explored through the following sub-problems.

Sub-problem 1: Are the participants of home gardens food secure as determined by the Household Food Insecurity Access Scale (HFIAS)?

Sub-problem 2: What are the factors influencing household food insecurity?

Sub-problem 3: Do the consumption frequencies of home garden participants differ from those of non-participants?

1.5 Delineations and limitation of the study

The study only focused on the HIV/AIDS affected households who were participants of the Masibumbane Home Garden Project and a control group consisting of HIV/AIDS affected households who were not participants of the home gardening project but clients of the Masibumbane Mission. Due to the nature and sensitivity nature of HIV/AIDS, no questions relating to the epidemic were asked. Due to the confidentiality of HIV/AIDS cases and the need to safeguard participants' rights, the researcher worked with the assistance of the responsible Project Coordinator. This could have affected the validity of information as the participants try to protect the project.

In addition, HIV/AIDS is still highly stigmatised in South Africa. This limited access to affected households, restricting the researcher from including more informants and limiting the number of households who participated in the study.

1.6 Assumptions

The researcher assumed that all participants of the home gardening project would be willing to participate in the study. Second, it was assumed that the survey questions were unambiguously phrased, and that translation from English into *isiZulu* by research assistants did not change the meaning or interpretation of the questions. The study also assumed that respondents were truthful and knowledgeable i.e. the information provided was not biased such that there would be no distortion in the results. An assumption was made that the methods of data analysis provided an accurate assessment of the food security status of home garden participants.

1.7 Organisational structure of the dissertation

This chapter outlined the background of the research problem, the importance of the study, the statement of the research problem, the sub-problems, the study delineation, limitations and the study assumptions. In chapter two, a review of literature related to the study is presented. Chapter three outlined a description of the study area. Chapter four describes the methodology used in the study. The results and discussions of the analyses are presented in chapter five. The study conclusions and recommendations are presented in chapter six.

CHAPTER 2

LITERATURE REVIEW

This chapter explores the unique nature of HIV/AIDS and the extent of the epidemic at global, regional, national and provincial levels. The importance of home gardens; their sustainability and benefits of having them were presented. Households coping strategies and responses to mitigate the impact of HIV/AIDS and impact of HIV/AIDS on households and communities in relation to livelihoods approach was discussed.

2.1 An overview of the unique nature of HIV/AIDS

Food insecurity has become a persistent development problem in Southern Africa's rural and urban areas - a problem exacerbated in its scope and impact by the HIV/AIDS epidemic (Frayne et al, undated). The HIV/AIDS epidemic has worsened food insecurity, created newly-vulnerable populations and reduced the capacity of poor households to secure sustainable livelihoods (Chaminuka et al, 2006; Mano et al, 2006). The intensity of poverty and HIV/AIDS in the same vulnerable households underpins a vicious cycle of food insecurity (Frayne et al, undated).

HIV/AIDS is not only a health issue, but an increasing number of individuals and organisations view HIV/AIDS as a global development problem (Haddad and Gillespie, 2001; Loevinsohn and Gillespie, 2003). A number of studies have systematically looked at the impact of HIV/AIDS in sub-Saharan Africa and demonstrated that its impact strip individuals, households and communities of their assets (Haddad and Gillespie, 2001; Stokes, 2003; CHGA, 2004a; CHGA, 2004b).

HIV/AIDS has manifold, wide-ranging impacts on individual and nations. Individuals who cannot afford anti-retroviral drugs are unable to work and, eventually die prematurely from AIDS (FAO, 2003). For households and communities, the aggregated impacts of HIV/AIDS morbidity and mortality may threaten their existence. At national level, the epidemic is reversing the economic growth of affected countries (Haddad and Gillespie, 2001). Loevinsohn and Gillespie (2003) also mentioned that changes in development created by HIV/AIDS exist at all levels in the economy, from households seeking to secure viable livelihoods to policymakers attempting to better understand the implications of the epidemic for their own sectoral goals and strategies.

The association of HIV/AIDS, food insecurity and poverty can also explain the fact that HIV/AIDS has become a development problem. HIV/AIDS is both a determining factor and a consequence of food insecurity. Whereas, poverty viewed in the context of HIV/AIDS is both a risk factor and a consequence of HIV infection (FAO, 2003; Cohen, 1998). This relationship is as illustrated in Figure 2.1. As a determining factor, HIV depletes livelihood asset bases leading to poverty and inequality that result in food insecurity. HIV/AIDS is also a consequence of food insecurity as undernourished individuals are more susceptible to infection than those who are well nourished. Malnutrition threatens to accelerate progression from HIV to AIDS because it weakens the immune system thereby exposing the poorly nourished person to the risk of being infected by opportunistic infections (de Waal and Whitehead, 2003).

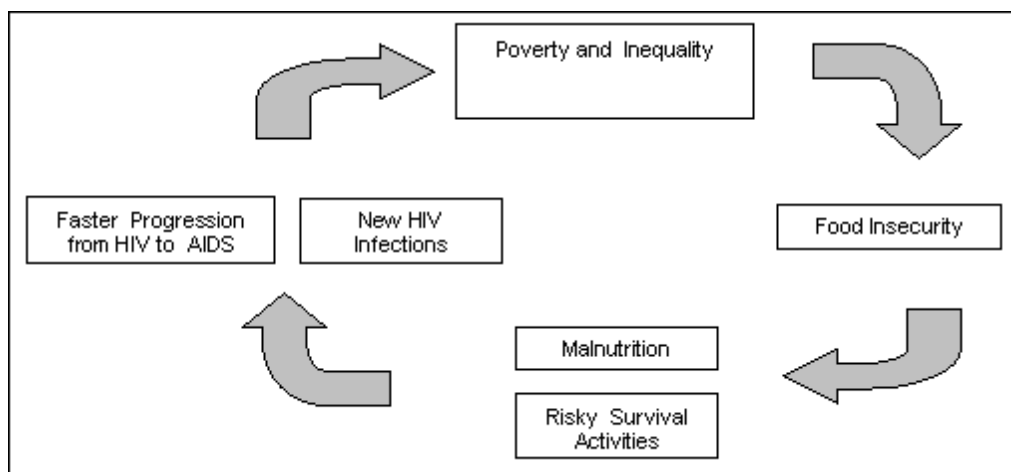


Figure 2.1: Bi-directional relationship between HIV/AIDS and food security (FAO, 2003).

Poverty is associated with weak endowments of human and financial resources such as low levels of education, illiteracy, poor health status and low labour productivity (Cohen, 1998). The inability to engage in income generating activities by poor households because of HIV infection, morbidity and mortality deepens the poverty of poor households. Poor households may find it more difficult to escape from poverty for many years and generations to come (Drimie, 2002). Efforts to reduce poverty could see the poor adopting various mitigation strategies to cope with the disease that often exposes them to HIV infections as illustrated in Figure 2.1. Cohen (1998) argues that since poor households try to make ends meet it is not surprising that they adopt strategies that expose them to HIV infection, for example prostitution.

Furthermore, HIV and AIDS are a shock and stress for rural livelihoods because it is unique in nature and impacts for the reasons that follow. Van Dyk (2001) asserted that HIV causes AIDS. AIDS in itself is not a specific illness, but a syndrome or collection of many conditions that manifest because HIV weakens the immune system. Van Dyk (2001) defined AIDS as a syndrome of opportunistic diseases, infections and certain cancers – each or all of

which were potentially fatal. Opportunistic diseases included diarrhoea, skin infections, pneumonia, cryptococcal meningitis, kaposi's sarcoma (a rare form of skin cancer) and tuberculosis (TB) (van Dyk, 2001). Opportunistic diseases kill the most productive and reproductive members of society in the 15-49 age bracket, thus increasing household dependency ratios, reducing household productivity and caring capacity, and interrupting the transfer of local knowledge and skills from one generation to the next (TANGO International, 2003).

In describing why HIV/AIDS is a shock and stress for rural households, de Waal and Whiteside (2003) posit the “new variant famine” hypothesis, which is a new paradigm for analysing the causes and trajectories of food insecurity in southern Africa, afflicted by a combination of shocks including a generalised AIDS epidemic, drought and poverty. The hypothesis points to the way in which HIV/AIDS accentuates existing shocks and stresses (de Waal and Whiteside, 2003). De Waal and Whiteside (2003) outline four factors which are characteristic of the “new variant famine” hypothesis namely:

- Household level labour shortages that are attributable to adult morbidity and mortality, as is the increase in numbers of dependents;
- Loss of assets and skills resulting from increased adult mortality;
- The burden of care is large for sick adults and children orphaned by AIDS and;
- Vicious cyclic interactions between malnutrition and HIV.

Thus, HIV/AIDS is a shock that threatens the ability of poor households to sustain livelihoods and food security. To highlight the reasons why HIV/AIDS is a shock and stress

for rural households, the following section discusses the extent of HIV/AIDS at global, regional, national and provincial levels.

2.2 Global, regional, national and provincial state of the HIV/AIDS epidemic

Although HIV/AIDS remains one of the world's most serious health challenges, global solidarity in the HIV/AIDS response during the past decade continues to generate extraordinary health gains. Although much of the news on AIDS is encouraging, challenges remain. The number of people newly infected globally is continuing to decline, but national epidemics continue to expand in many parts of the world. Further, declines in the numbers of children dying from AIDS-related causes and acquiring HIV infection, although substantial, need to be accelerated to achieve global AIDS targets (UNAIDS, 2012a).

Since the beginning of the epidemic, almost 70 million people have been infected with the HIV virus and about 35 million people have died of AIDS (WHO, 2013). Globally, 34.0 million people were living with HIV at the end of 2011 compared to 29.4 million in 2001, a 16% increase. An estimated 0.8% of adults aged 15-49 years worldwide are living with HIV, although the burden of the epidemic continues to vary considerably between countries and regions (UNAIDS, 2012a). In the past decade there has been a significant reduction in the number of new infections especially in sub-Saharan Africa. Countries are making massive efforts towards ending the HIV/AIDS epidemic. In 2011, there were 700 000 fewer new HIV infections across the world than in 2001 (UNAIDS, 2012b). In 2011, 1.7 people died from AIDS-related causes worldwide. This represents a 24% decline in AIDS-related mortality compared with 2005 (when 2.3 million deaths occurred) (UNAIDS, 2012a).

Sub-Saharan Africa remains most severely affected, with nearly 1 in every 20 adults (4.9%) living with HIV and accounting for 69% of the people living with HIV worldwide (UNAIDS,

2010; UNAIDS, 2012a). In Southern Africa, where most countries have large numbers of people living with HIV or high HIV prevalence, the number of people acquiring HIV has been dramatically reduced. Between 2001 and 2011, in Malawi, the rate of new HIV infections dropped by 73%, in Botswana by 71%, in Namibia by 68%, in Zambia by 58% and in Zimbabwe by 50% (UNAIDS, 2012b). South Africa, the country with the largest number of HIV infections, reduced new HIV infections by 41%. Swaziland has the highest HIV prevalence in the world but new HIV infections dropped by 37% (UNAIDS, 2012b). The number of people dying from AIDS-related causes in sub-Saharan Africa declined by 32% from 2005 to 2011, although the region still accounted for 70% of all the people dying from AIDS in 2011 (UNAIDS, 2012a).

South Africa is one of the countries most severely affected by the AIDS epidemic, with the largest number of HIV infections in the world. The total number of persons living with HIV in South Africa increased from an estimated 4.21 million in 2001 to 5.38 million by 2011. In 2011 an estimated 10.6% of the total population was HIV positive (Stats SA, 2011). Shisana, et al. (2009) estimated the HIV prevalence for 2008 at 10.9%. Approximately one-fifth of South African women in their reproductive ages are HIV positive. South Africa's generalised HIV epidemic is defined as being hyper-endemic due to the high rate of HIV prevalence and the modes and drivers of HIV transmission. Heterosexual sex is recognized as the predominant mode of HIV transmission in the country followed by mother-to-child transmission, and drivers of the epidemic include migration, low perceptions of risk, and multiple concurrent sexual partnerships

The direct measurement of HIV incidence is extremely challenging, and there is currently no consensus in South Africa on the best method for incidence measurement, though there are ongoing efforts within the research community to reach consensus on the best tools and

methodologies for measuring HIV incidence. HIV epidemic trends are measured through two methodologies in the country, namely: the annual antenatal HIV prevalence survey, and various population or household based surveys. South Africa is the country that has made the highest domestic investment in AIDS among all low- and middle-income countries. It alone invested US\$ 1.9 billion last year from public sources, resulting in a five-fold increase between 2006 and 2011 (UNAIDS, 2012b).

Different provinces in South Africa however experience different levels of HIV infections and AIDS related deaths. KwaZulu-Natal is experiencing the most severe HIV epidemic in the country. A total of 1.6 million people (16% of the population) and nearly a third of all adults were estimated to be HIV positive in 2008. The epidemic has reached a mature phase with AIDS deaths and new infections leveling off. An estimated 300 000 people were in need of antiretroviral treatment in 2008 and less than 50% had taken up treatment (UNAIDS, 2009). However, KwaZulu-Natal has made remarkable progress in expanding access to antiretroviral treatment as well as in reducing new HIV infections. From 2011 to the beginning of 2013 more than 300 000 men have undergone medical male circumcision decreasing their risk of HIV infection (WHO, 2013). Although it remains high, the overall HIV prevalence among 15-24 years old dropped from 31% in 2009 to 25.5% in 2011 (UNAIDS, 2012a).

Having briefly examined the unique nature of HIV/AIDS and the extent of the epidemic globally, regionally, nationally and provincially, the next sub-section explores the food security status on South Africa.

2.3 Food security status in South Africa

The issue of food security has been critical in many parts of the world including South Africa. The right to food is enshrined in international and national law. In South Africa, food security received much attention after 1994 when South Africa became a democratic country. The right to access to sufficient food was embedded in Section 26 and 27 of the South African Constitutional law of 1996. The constitution indicates that every South African citizen has a right to sufficient food and water; and social security (du Toit, 2011).

Food security became a priority policy issue for South Africa because of the acute food shortages and hunger which were being experienced across its borders. In 2003, Zimbabwe alone had acute food shortages resulting in millions of people in danger of starvation. During this period, unlike most previous famines, there were strong indications that this one was not simply a short-term phenomenon brought about by a single season's unfavourable weather or even by temporary political turbulence (de Kerk et al, 2004). While both of the latter are certainly important immediate causes of the emergency, in combination with the HIV/AIDS pandemic, the damage caused to so many rural households' – and indeed to national - physical, financial and human asset bases made it increasingly difficult for them to restore their production to previous levels, even when the rains and political stability return. In other words, food insecurity that is already widespread and acute now looks likely also to become chronic (de Kerk et al, 2004).

South Africa is largely deemed a food secure nation producing enough staple foods or having the capacity to import food, if needed in order to meet the basic nutritional requirements of its population (FAO, 2008). Aliber et al (2009) supported the argument that South Africa seems to be food secure at national level but the same cannot be said at household level. More than

14 million people, or about 35% of the population in South Africa, are estimated to be vulnerable to food insecurity, while the development of as many as 1,5 million, or about one quarter, of children under the age of 6 is reckoned to have been stunted by malnutrition. The Constitution - if not society's values and the sheer economic cost of forgone production potential - dictates the need to reduce and, if possible, eliminate vulnerability to and the negative consequences of food insecurity within South Africa.

In the 2010/2011 financial year food security was reprioritised as one of the top priorities for South African government (State of Nation Address, 2010). This was done in line with South Africa's millennium development goal which aims to halve the proportion of people who go hungry over the period 1990 and 2015 and to halve poverty and unemployment by 2014. The Department of Agriculture, Forestry and Fisheries (DAFF)'s major role is, among others, to ensure that opportunities are created to encourage South African citizens to participate in agriculture and produce to reduce food insecurity in the country. The department has since initiated a number of programmes that are meant to contribute positively to food security in the country (du Toit, 2011). Thus the following sub-section examines the household food security indicators found in international literature.

2.4 Household food security indicators

Measuring food insecurity has been an ongoing challenge to researchers and practitioners (Coates et al, 2007). For years, measures of food security have been incorporated both objective (consumption) and subjective (self-reported behaviors) indicators to allow for the evaluation and monitoring of food security and nutrition at national, regional, community, household and individual levels. Household unit of analysis is crucial as food scarcity is ultimately experienced at the household level. There are three commonly used indicators of

household food security – experience in hunger, dietary diversity and coping strategies (Kirkland et al, 2011). Coping strategies will be discussed in-depth in section 2.9.

Dietary diversity has traditionally been measured using a simple count of food or food groups consumed over a reference period, typically ranging from 1 to 15 days (Ruel 2003). Single food counts are referred to as ‘food variety score (FVS)’, whereas food group count is considered the ‘dietary diversity score (DDS)’ (Ruel 2003). Despite the absence of a standardized measurement tool to evaluate dietary diversity across settings, the variety of measures employed have indicated a positive relationship between dietary diversity and nutrient adequacy, both in developed and developing countries (Kirkland, 2011). Studies have been carried out to investigate the relationship between dietary diversity and household socioeconomic status. Findings indicate that dietary diversity is greater among households with higher socioeconomic status (Hatloy et al, 2000; Leatherman, 1994; Ferguson et al, 1993).

Experience in hunger is measured using the Household Food Insecurity Access Scale (HFIAS). This tool was an adaptation of the approach used to generate the annual number of food insecure and hungry people in the United States (US). This method is based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarized in a scale (Coates et al, 2007). In studies representing 15 different countries, Coates et al (2007) found that insufficient food quantity, inadequate food quality, and uncertainty and worry about food are universal experiences of food insecurity and that there are recognized similarities in how households across contexts manage food insecurity. Validation studies in Burkina Faso and Bangladesh showed the HFIAS could be applied successfully in different developing country

contexts to assess, evaluate, or monitor household food insecurity (Swindale and Bilinsky 2006; Frongillo & Nanama 2004).

2.5 Impact of HIV/AIDS on food security and nutrition

From a biological level perspective, macro and micronutrients boosts the immune system to fight against opportunistic infections. HIV/AIDS compromises nutritional status exposing the body to infections and malnutrition while increasing the effects of HIV by weakening the immune system. HIV-affected households are at risk of food insecurity and malnutrition as the sick members are unable to work, income declines, expenditure on health increases and care giving burdens increase (Piot and Pinstруп-Andersen, 2002).

All the effects of HIV/AIDS on the livelihood assets trickle down to its impact on food security and nutrition. In Figure 2.2 Topouzis (2004) shows the impact of HIV on the four aspects of food security, namely food availability, food access, stability of supply, and utilization. From the same figure, CHGA (2004a) concludes that all aspects of food security are impacted as a result of a decline in household production below a point where the household can no longer make adequate provision for its members. For subsistence farmers, this means that the production unit can no longer grow enough food to feed themselves, and for non-farmers, it means that the income is insufficient to acquire the necessary quantities and qualities of food.

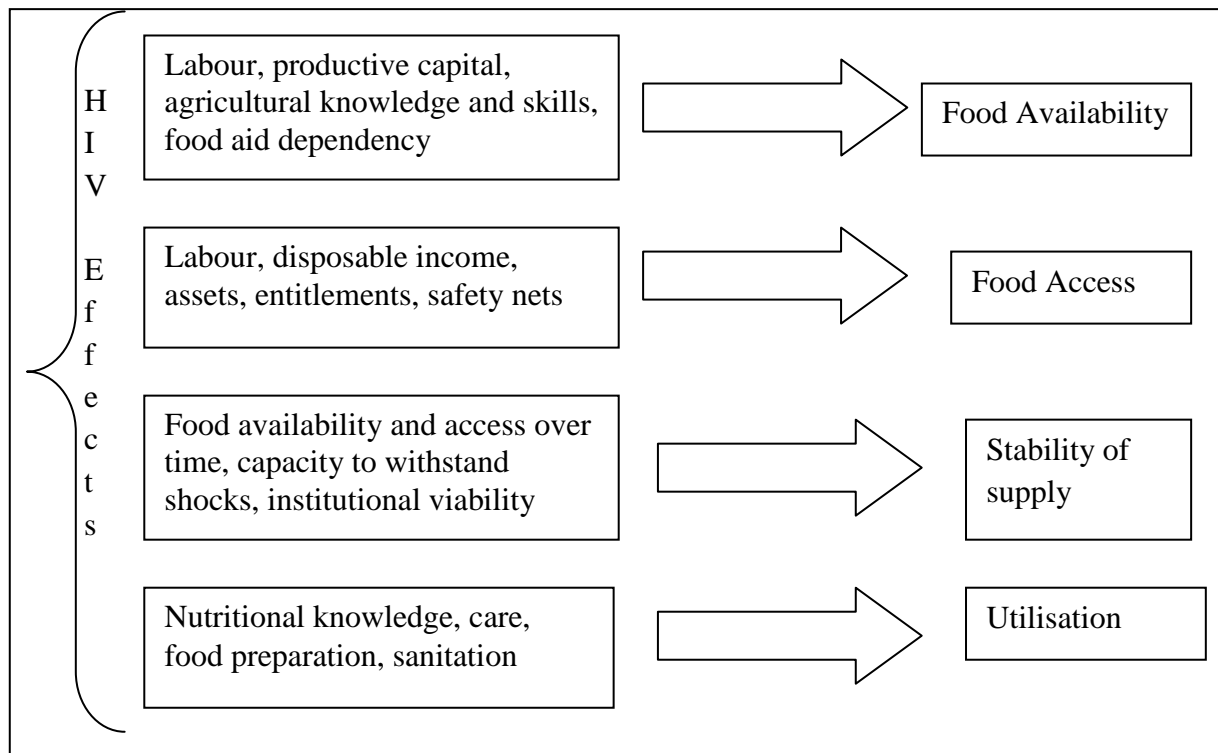


Figure 2.2: Paths through which HIV/AIDS affects food security (Topouzis, 2004).

To better understand the extent to which HIV/AIDS impacts on food security and nutrition, the following sub-section explores the nutritional requirements for PLWHA. This particularly explores the utilisation component of food security.

2.6 Nutritional requirements of PLWHA

The HIV/AIDS epidemic has had a devastating impact on health, nutrition, food security and overall socioeconomic development in countries that have been greatly affected by the disease. Severe weight loss and wasting are some of the earliest recognized signs of HIV infection (Garcia-Prats et al, undated). When infected with the HIV virus the body's defence system – the immune system – works harder to fight infection. This increases energy and nutrient requirements. Further infection and fever also increase the body's demand for food. Once people are infected with HIV they have to eat more to meet these extra energy and

nutrient needs. Such needs will increase even further as the HIV/AIDS symptoms develop (WHO and FAO, 2002).

Even though PLWHA have to eat more, HIV/AIDS reduces food intake due to various reasons. The illness and the medicines taken for it may reduce the appetite, modify the taste of food and prevent the body from absorbing it; symptoms such as a sore mouth, nausea and vomiting make it difficult to eat; tiredness, isolation and depression reduce the appetite and the willingness to make an effort to prepare food and eat regularly; there is not enough money to buy food (Garcia-Prats et al, undated; WHO and FAO, 2002). Due to these reasons, HIV is said to contribute to malnutrition and can directly or indirectly result in decreased caloric intake, increased loss of nutrients and increased use of nutrients/energy. As discussed in the first section of this chapter, the interaction between malnutrition and HIV is complex. Recognizing malnutrition is important because it may predict disease progression and higher risk of morbidity and mortality. The presence of malnutrition is a predictor of worse outcomes in both HIV-infected adults and children (WHO and FAO, 2002).

Good nutritional status is very important from the time a person is infected with HIV and it also helps maintain the health and quality of life of the person suffering from AIDS. Nutritional education at this early stage gives the person a chance to build up healthy eating habits and to take action to improve food security in home, particularly as regards to the cultivation, storage and cooking of food. Figure 2.3 shows the relationship between good nutrition and HIV/AIDS. Healthy and balanced nutrition should be one of the goals of counselling and care at all stages of HIV infection (WHO and FAO, 2002).

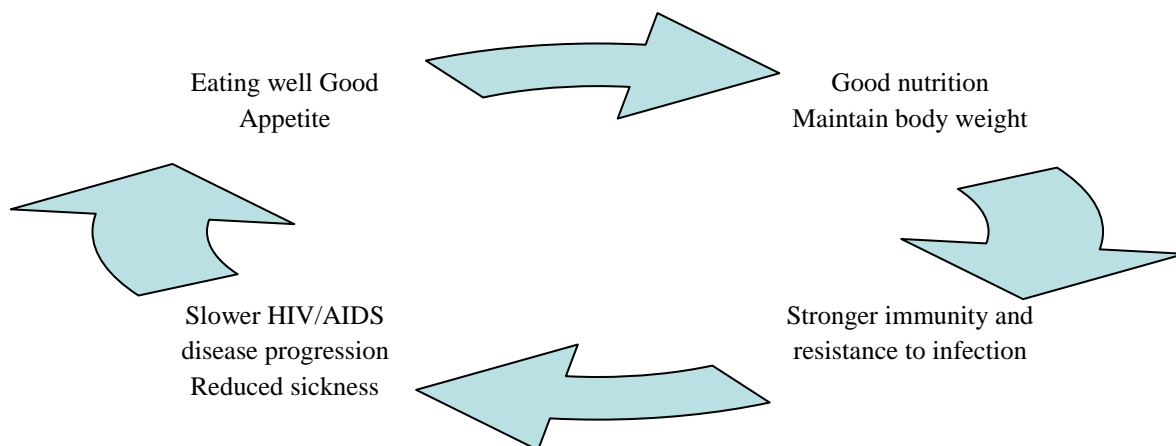


Figure 2.3: Relationship between good nutrition and HIV/AIDS (WHO and FAO, 2002: 11)

Vitamins and minerals are essential to keep healthy. Vitamins and minerals protect against opportunistic infection by ensuring that the lining of skin, lungs and gut remain healthy and that the immune system functions properly. Of special importance are vitamin A, vitamin C, vitamin E, certain B-group vitamins and minerals such as selenium, zinc and iron. A mixed diet should provide enough of these vitamins and minerals. Most of these essential vitamins and minerals are found in fruits and vegetables hence the following section discusses home gardens as a mitigation intervention for food security and nutrition of PLWHA (Garcia-Prats et al, undated).

2.7 Home gardens as a mitigation intervention for food security and nutrition

A home garden refers to farming activities around a homestead, where several species of plants are grown and maintained by the household members and their products are primarily intended for the family consumption (Sthapit et al, 2004). Home gardening is a family food production system widely practised in developing and developed countries under numerous forms. A number of terms have been used to refer to these garden production systems such as homestead garden, backyard garden and kitchen gardens (Hussain and Clay, 1999). A traditional home garden typically includes a wide diversity of perennial and semi-perennial

crops, trees, shrubs and condiments. Some gardens also include small animal rearing, particularly poultry and fish raising (Hussain and Clay, 1999). These gardens have an established tradition and offer great potential for improving household food security and alleviating micronutrient deficiencies (FAO, 2010).

Home gardens are becoming an increasingly important source of food and income for poor households in peri-urban and urban areas. Even in rural areas where people have limited income-generating activities and poor access to markets, producing different kinds of foods in home gardens could provide a source of micro and macronutrients (FAO, 2010). Generally the functions and output of home gardens complement the functions and output of field agriculture. The bulk of energy-giving foods needed by the household come from field agriculture and home gardening is a supplementary source of other essential nutrients like minerals and vitamin-rich leafy vegetables and fruits, animal sources of protein and herbs and condiments (Hussain and Clay, 1999).

However, promotion of gardening as a nutrition or community development strategy is controversial, with strong advocates and opponents (Marsh, 1998). Critics point to poor project design, management and monitoring, unrealized expectations and lack of sustainability. Marsh (1998) states that some studies indicate that fortification and supplementation is a better nutrition intervention compared to home gardening. Home gardening is only feasible to people with access to land and water and this leaves many landless households still food insecure. Moreover, homestead production is an unreliable source of food and income for poor households yet it's embraced as a solution for food insecurity (Marsh, 1998). Contrarily, home gardening has been used as a sustainable strategy for improving food security and incomes in areas where gardens are well adapted to local agronomic and resource conditions, cultural traditions and preferences (Marsh, 1998).

2.7.1 The possible benefits of home gardens

Hartivegsen and A'Bear (2004) stated that the importance and role of small scale homestead gardening has been overlooked by development policymakers as they are biased towards large-scale field based commercial farming. Sustainable food security involves strengthening the livelihood security of all members within the household by ensuring both physical and economic access to balanced diet including the needed micronutrient. Home gardening contributes to household food security by providing direct access to food (Wanasinghe, 2003; Marsh, 1998). Direct access to food cause a reduction on the impact of loss in income for PLWHA as households will not be purchasing them. Home gardens make available fresh foods that improve the quality and quantity of nutrients available to the family. To destitute households, home gardens may constitute the only source of certain nutrients and can be a major or only source of food between harvests or when harvest fails (Hartivegsen and A'Bear, 2004).

A well-developed home garden has the potential, when access to land and water is not a major limitation, to supply most of the non-staple foods that a family needs every day of the year, including roots and tubers, vegetables and fruits, legumes, herbs and spices, small animals and fish. Roots and tubers are rich in energy and legumes are important sources of protein, fat, iron and vitamins. Green leafy vegetables and yellow- or orange-coloured fruits provide essential vitamins and minerals, particularly folate, and vitamins A, E and C. Vegetables and fruits are a vital component of a healthy diet and should be eaten as part of every meal. Meat, chicken and fish are good sources of protein, fat and micronutrients, particularly iron and zinc (FAO, 2010). The maintenance of this form of production, in the long run, is essential for its economic and nutritional merit. Again, the importance of gardens is further affirmed by the fact that in times of emergency, societies have had to return to the

use of gardens to improve food security, as, for example, Irish potato gardens during the Great Depression (Hussain and Clay, 1999).

Even to the poorest homestead, unutilized marginal land is often the only resource available to them. Gardening can turn this land into productive source of food and even provide economic security. Most home garden systems are organic-based ensuring availability of fresh pesticides and chemicals-free vegetables, mainly because they use a few purchased inputs as they are primarily for household consumption. Therefore, home gardening involves little risk because of their low capital investment in technology and the cultivation of a variety of crops. The variety of crops planted also ensure household access to fresh produce throughout the year and it means that they are able to rely on other crops in the event that one crop fails thereby improving household food security (Hartivegsen and A'Bear, 2004).

Diets rich in energy and poor in leafy vegetables, fruits and animal proteins may lead to vulnerability to sickness like diabetes, heart diseases and high blood pressures (Wanasinghe, 2003). PLWHA are encouraged to include vegetables and fruits in their diets as they boost the immune system and protect the body against opportunistic infections. Majority of vegetable products in rural communities come from home gardens. Vegetables provide adequate nutrients to overcome malnutrition as they contain primary nutritional constituents like proteins, minerals, vitamins especially A, B and C, and calories (Wanasinghe, 2003).

Vegetables are the cheapest source of nutritious foods compared to other sources like vitamin supplements (FAO, 2010), implying that with home gardens, poor and vulnerable groups like orphans and PLWHA can afford nutritious diets. However, vegetables alone cannot provide essentially for PLWHA because essential amino acids are only contained in animal protein and also the quality and bio-utilisation of animal protein is higher than plant protein. Thus,

animal protein is needed in the diets along with plant proteins and that is why home gardening is not only about vegetables but also keeping of animals (Wanasinghe, 2003).

Home gardens have economic benefits as gardeners sell their surplus produce and animal products to generate income and thus alleviate poverty (Husain and Clay, 1999). Home gardening is part of household livelihood strategy and has gained prominence as a natural asset through which sustainable use of resources, particularly for the livelihoods of the poor and PLWHA, may be achieved (Maroyi, 2009). Home gardening, just like field agriculture is affected by seasonal changes. The income generated from garden produce sold varies seasonally because of the variations in production. In winter, production tends to fall resulting in reduced income which may rise in favourable seasons. Nevertheless, the small amounts of cash incomes from home gardens make a vital difference between relative well being and hardship, reducing debt and starvation in cash poor societies (Hartivegsen and A'Bear, 2004).

In a study in Nhema, Zimbabwe, Maroyi (2009) found that home gardens produce supplement staple crops and also serve as a source of income for several families. Home-gardens enable year round production of different products, reducing the risk of production failure.

Marsh (1998) asserted that traditionally, gardeners would feed their families first and then sell, barter or give away surplus garden produce. In certain contexts, however, income generation may become the primary objective of the home garden. In any case it is counterproductive to impose the nutrition objective to the exclusion of the income generation objective, since in most gardening contexts they are linked and compatible. Hendriks and Msaki (2006) in a study in KwaZulu-Natal, South Africa found that involvement of smallholder in commercial agriculture yielded positive effects on food diversity, consumption

patterns and food intakes because an increase in income resulted in an increase in food expenditure. However, they concluded that from the findings of the study, it cannot be conclusively stated that small holder commercialisation can alleviate hunger or solve malnutrition.

Among low income households the factors of production, including time, energy, money and land are available in small discrete increments through time and space. For households affected by HIV/AIDS most of their time is consumed by caring for the sick and for agrarian households very little time will be available to work in the field. However, home gardens provide an effective way to use these limited resources without interfering with field crop production or other productive activities. In terms of the labour inputs, small amounts of the family member's spare time can be used effectively to nurture the garden without interfering with the time needed to care for the sick or do household chores. Gardening may be done with virtually no economic resources using locally available planting materials, green manures, fencing and indigenous methods of pest control. Thus, home gardening at some level is a production system that the poor can get involved (Hartivegsen and A'Bear, 2004).

2.7.2 Home gardening as a livelihood activity

Home gardens are part of the many strategies being used by the government and development agencies to mitigate the impact of HIV/AIDS in households. A sustainable livelihood is the one with objectives to improve the capital assets of a household. Home gardens are a natural asset through which other livelihood objectives, such as gender equality, improvement in human capital, increase in finances and sustainable use of resources may be achieved. In addition, land can be a route or opportunity through which a multitude of other assets become accessible to the household. Access to land sufficient to establish a home garden can enable a household to produce foods for consumption or trade. Sales from surplus produce will

improve the financial status of the household. Skills learned in production increase the family's human assets. Consumed foods improve the family's nutritional status and food security. Trade, exchange of information and cooperation with other villagers strengthens the family's relationships with others.

The main features of a home garden according to Brownrigg (1985) are: they are located near homes; contain a wide variety of plants and because of this, nutrients are recycled in a sustainable manner; garden production is a supplementary source of food and income: gardens unlike field agriculture require small area for production to take place and lastly Marsh (1998) added that garden production require little or no economic resources making it a sustainable livelihood as households make use of available resources. The garden may become the principal source of household food and income during periods of stress, e.g. the pre-harvest lean season, harvest failure, prolonged unemployment, health or other disabilities suffered by family members (Marsh, 1998).

Continued cultivation and use of home gardens over the past millennium has played a key role in successful achievement of sustainable livelihoods. Plants grown in home gardens provide families with income and nutritious vegetables. These with other advantages of home gardens help communities to achieve self-sufficiency and self reliance (Maroyi, 2009).

2.7.3 Factors for successful home gardening promotion

The home gardening families should be made aware of the nutritional values and be taught home gardening planning in order to make informed decisions on how to use the home garden to produce foods to supplement and improve the family diet. When designing an effective means of communicating an appropriate nutrition strategy, project coordinators must understand the traditional diet and food taboos, seasonal food shortages, food storage

and food cooking practices, and distribution of food within the household so that their design is at par with the household's tradition. It is most effective to integrate gardening technique training with nutrition education so that households can plant varieties that comply with their taste preferences and supply nutrients year-round (Marsh, 1998).

The use of conservative methods to preserve the environment is also required in order to promote successful home gardens. Even where home gardening families have experience in plant and animal production, they may not fully understand the long-term consequences of various production techniques. Home gardeners who do not take proper steps to preserve soil fertility may eventually find that the soil is exhausted due to depletion of nutrients. Implementers of home gardening projects and extension officers can educate households on the importance of using animal manures and composting of kitchen wastes to help restore nutrients to soils. The fact that home gardens have persisted for generations in some societies without the use of artificial fertilizers suggests that viable low-cost strategies for preserving soil fertility exist. Programmes promoting home gardening should include an agricultural extension component that helps families to appreciate the importance of soil fertility and affordable techniques that will preserve soil nutrients (Mitchell and Hanstad, 2004).

Agricultural extension and nutritional education can serve another important purpose in helping families to understand and value the economic practicalities of home gardening, as well as the ways in which home gardening can contribute to family food security, family nutrition, family income and family social status. Ideally, the local community will value home gardening as an appropriate strategy for all families rather than as a leisure activity of wealthier households, or a mark of household poverty. Home gardens may be a better strategy for improving the livelihoods of the PLWHA if home gardens are presented as a universal strategy for improving household nutrition and household independence, rather than

as a strategy of subsistence (Marsh, 1998). If non-affected and wealthy families participate in home gardening, this removes the social stigma of gardening as an activity of the poor, and improves the relative status of poor families by providing them with another activity they have in common with non-poor families. For these reasons, policy makers should consider whether agricultural extension should target all home gardening households other than just the poor households or HIV/AIDS affected households.

Organisations should promote the economic benefits of home gardening rather than focus solely on benefits of home consumption. Increased income from home gardening can also be used to purchase more nutritious foods that cannot be produced in the gardens. Other potential economic benefits of home gardening include:

- a) returns to land and labour are often higher for home gardens than for field agriculture because much more is produced on a small piece of land,
- b) home gardens can supply fodder for animals, fuel wood, supplies for handicrafts,
- c) household processing of home garden fruits and vegetables can increase their market value and preserve them for later consumption, and
- d) sale of home garden produce may be one of the only sources of independent income for women (Marsh 1998).

2.8 Empirical evidence from successful home garden projects

According to Landon-Lane (2004) the most successful home gardening efforts in terms of food security and sustainability are those that have involved the health and nutrition and agriculture sectors in an integrated approach. Participation by NGOs and community organisations is equally important. The success of home gardening also comes from research and extension as well as supportive land use regulations.

2.8.1 Themba lethu Home Project (Mpumalanga, South Africa)

The project was initiated in October 2002 as a response to the poverty and hunger situations faced by the care workers of Themba lethu Home Based Care's (THBC). THBC initiated the project along with Transvaal Suiker Beperk (TSB), German Technical Corporation (GTZ) and the Department of Agriculture. The project was aimed at alleviating hunger and be an income source for the HIV/AIDS affected households. It was targeted to encourage orphans, destitute households, and the elderly to grow gardens so as to empower them to take control of their difficult circumstances. At the commencement of the project, 30 care workers were trained by TSB in home gardening methods. These care workers then trained the families of their patients in order to ensure the use of proper gardening methods (THBC, 2008).

By 2007 over 900 gardens were established. The project has had a positive impact with an estimated direct and indirect 10,000 beneficiaries. THBC gardens are kept by care workers, the Youth in Action, orphans, vulnerable children, and families affected by HIV/AIDS. The vegetables grown by the care workers are used to feed their own families along with their patients and orphans. Extra produce is sold in local markets. Some of the gardens have achieved profits in excess of R1000 per year. Towards the end of the year all successful gardens are entered in an annual competition. The aim of the contest is to motivate the gardeners to grow healthy produce. THBC also offer after school programs which are run garden projects and a total of 660 orphans from 11 villages benefit from the program (THBC, 2008).

2.8.2 Development Aid from People to People (DAPP) – Zambia

Practical Action Southern Africa in collaboration with a local NGO, DAPP have implemented the Improving the Food and Livelihood Security of Communities Affected by

HIV/AIDS project in Zambia. The project worked with civil society partners and the local government at community level throughout Kabwe and Kapiri-Mposhi districts to reduce the impact of the disease, especially by empowering people in these two districts. The two year project which targeted 2,000 vulnerable PLWHA and their families commenced in May 2006 and was aimed to reduce dependency on food aid through increased food production and income earning opportunities. To achieve this, the project aimed at strengthening local awareness and mutual support mechanisms within the target communities (Nyathi, 2009).

The project was to enable HIV/AIDS affected households increase food production, consumption and incomes. This was achieved by first training all support groups in conservation farming, sustainable crop production and management practices before distributing seed packs (Nyathi, 2009). Two thousand PLWHA and their families are now producing a large proportion of their own food. Through the project, the seasonal period of food deficit has been reduced for the 2000 families targeted by the project. Beneficiaries in peri-urban areas that had a deficit period of six months prior to the project now face a deficit period of three months, whilst those in rural areas had their deficit reduced from three months and are now food secure all year round. Food access from own production has increased to a minimum of eight months for ground nuts, soya beans, cow peas, sweet potatoes and cassava, whilst garden produce is available all the year round. Not only is the home gardening for food consumption, it is one of the income generating activities together with chicken rearing (Nyathi, 2009).

2.9 Household coping strategies to HIV/AIDS impacts

Coping strategies notion has increasingly become popular in attempting to explain household responses to disasters, especially in the 1970s and 1980s when famine threatened and claimed

lives of hundreds of thousands particularly in north-east Africa and the Sahel region (Rugalema, 2000). Since then, the notion has been used widely to explain household responses to famines (Corbett, 1988; de Waal, 1989; Devereux, 1993). The term coping is not common in medical literature except in mental health. However, the advent of HIV/AIDS has given the notion of coping strategies a new lease of life as it is being used in analysing the impact of the disease on households (World bank, 1997; UNAIDS, 1999b; Topouzis, 1999).

In attempting to find the meaning of coping strategies, Rugalema (2000) begins by defining the word cope. Coping was defined as the ability to overcome a difficult situation so that, after a major setback, a household is able to regain or even surpass its former living standard. This implies that households and communities are able to rebuild their lives or rebound from the disasters, for example, recovering assets which had been disposed and thereby restoring food production. Coping is assumed to be achieved through a strategy and this is defined by Rugalema (2000) as a general plan or set of plans intended to achieve something. Households are assumed to have plans set aside to cope with difficulties. Therefore, coping strategies are the responses made by a household in attempting to overcome an adverse situation (Rugalema, 2000).

Rugalema (2000) challenged the usefulness of the concept of coping strategies put forward by UNAIDS. The argument was mainly that the concept is of limited value in explaining the household experience in the context of HIV/AIDS and may divert policy-makers from the enormity of the crisis. Rugalema (2000) pointed out several reasons why the concept is of limited use and argued that any meaningful analysis of coping behaviour must include the real and full costs of coping. First, he argued that the term coping strategies is essentially concerned with analysis of success rather than failure. He added that the notion has limited capacity to explain the failure in coping because to say that households are coping means

they are managing well or at least persevering. In many instances, adult mortality results in household dissolution, and this is a clear indication of failure to cope with the effects of mortality and morbidity. This runs contrary to a concept of strategy intended to avert the breakdown of the household unit.

Second, Rugalema (2000) argued that during a crisis, decisions are not based on the importance of an asset but rather on saving lives because households do not act in accordance with a previously formulated plan or strategy, but react to the immediacy of need, disposing of assets when no alternatives are available. According to him, more evidence is emerging that even land, the “most important agrarian asset”, may not be spared in the quest to ‘cope’ with illness. A study on the impact of HIV/AIDS on female microfinance clients in Kenya and Uganda found that there was a clear sequence of “asset liquidation” among AIDS caregivers in order to cope with the economic impact – first liquidating savings, then business income, then household assets, then productive assets and, finally, disposing of land (Drimie, 2002). This last resort of disposing of land has profound consequences for people losing their economic base. Walker (2002) asserts that such people are likely to be those with fewest options and those who are most vulnerable.

Third, Rugalema (2000) highlighted that coping strategies are defined as short-term responses to entitlement and this in a way fails to point out the true cost of coping. For example, limiting the number and quality of meals results in the short-term consequence of survivors suffering poor nutrition but in the long term, nutrition experts demonstrate that malnourished children are underachievers and their children are likely to be underachievers as well. This means that limiting food consumption has implications for future generations of affected households. The fourth shortcoming on the use of coping strategies concerns the time span invoked in the analysis of coping behaviour. By definition, coping strategies emphasises on

the maintenance of household social and economic viability after the disaster has occurred. Most studies on HIV/AIDS however do not support this because the effects of morbidity and mortality show that households become even more insecure than before AIDS.

Fifth, Rugalema (2000) dismissed the premise that famine and HIV/AIDS are similar disasters in their effects and impact on behaviour. Rugalema argued that one of the dimensions that distinguish HIV/AIDS from other disasters relates to the specific way in which HIV/AIDS affects household demography and assets. Unless the fundamental differences between HIV/AIDS and other disasters are factored in, general adoption of the coping framework in analysis of the effects of the epidemic will remain problematic (Rugalema, 2000).

Finally, Rugalema (2000) focused his argument on the utility of the framework of coping strategies for shaping policy. In the case of HIV/AIDS, the rhetoric of coping strategies has become an excuse (especially for African governments) for doing nothing or too little to alleviate the effects of the epidemic on communities. Rugalema (2000) concluded that instead of “coping strategies”, the concept of “struggling” could be adopted particularly in the wake of HIV/AIDS.

Van Liere (2002) shared Rugalema (2000)’s view that some of the coping responses actually render households more insecure and vulnerable in the long term, particularly sale of assets, withdrawing children from schools, reduction of food consumption and the use of savings and investments. In addition, de Waal (2002) argued that fewer vulnerable households could be expected to cope or recover from the periodic food security shocks to which they are constantly subjected. Nevertheless, in this study, even though the usefulness and application of “coping strategies” is challenged by Rugalema (2000) and de Waal (2002), the distinction

between “coping” and “failure to cope” is an important distinction to note in the famine literature (Dreze & Sen, 1989). In addition, while the use of the term “struggling” instead of “coping” strategies by Rugalema (2000) explicitly and directly points to the difficult situations posed by shocks such as HIV/AIDS and food insecurity, the concept of “coping strategies” as used in this study emphasises and acknowledges the potential within or of people (despite being resource poor) to bounce back from adverse situations.

Coping strategies are often applied in sequence so that household assets that enable a continuation of livelihoods are preserved (Ellis, 2000; Watts, 1983). Key factors determining sequence and stages of coping strategies occur out of commitment to household resources and the degree of reversibility of each response. It is common that household wealth levels determine how many strategies are taken up, with poorer households left further along the continuum of coping strategies when a crisis ends (Corbett, 1988).

Watts (1983) observed the following sequence of coping strategies in response to famine in rural areas of Nigeria in the 1970s: collection of famine foods; borrowing grain from kin; sale of labour power; engaging in dry season farming; sale of small livestock; borrowing of grain or money from merchants; sale of domestic assets; pledging farmland; sale of farmland and finally permanent migration. De Waal (1989) suggested that food security crises can trigger multiple crises and so households respond to a range of crises, which might include health epidemics or physical security and food insecurity.

Corbett (1988) asserted that the first stage of household food insecurity is marked by an initial shortage of food, or inability to provide sufficient quantities of food to all household members. When food access lessens or resources wane, coping strategies employed might be dietary change (consuming maize instead of rice), reduction in the number of meals per day (rationing), gathering of wild foods, seeking wage labour, and borrowing from relatives

(Corbett, 1988). If the shortage continues or worsens, the household may enter the second stage, where more drastic measures would be implemented such as selling non-productive assets (jewellery, goats); taking out loans outside of kinship networks; temporarily migrating for work (or land to farm); or skipping meals for an entire day (Corbett, 1988). In the third stage the situation worsens further, leading to sale of land, equipment, animals, and other productive assets (Corbett, 1988). Stage four, destitution, involves permanent migration, probably in search of food aid, due to the fact that household members are too weak and/or sick to work (Corbett, 1988). As can be seen, more severe (and sometimes more numerous) coping strategies are practiced under adverse conditions

HIV/AIDS shock is different from sudden shocks such as drought, floods and pest attacks in that after the occurrence of the latter, a household can recover from the shock in the next time period as it would have caused transitory or temporary food insecurity mainly due to crop failure. Contrary to this, HIV/AIDS will mean that the household will not revert to its original state in the next time period leading the household to rapidly descend into chronic food insecurity because of losses in assets (Thomson and Metz, 1997). Although households with HIV/AIDS face particular and severe challenges, various studies (Barnett & Whiteside, 2002; White & Robinson, 2000; Davies, 1996; Singh & Titi, 1994) indicated that the actual sequencing of coping behaviour for household demographic changes was similar to that undertaken by rural households in response to acute food insecurity caused by crop failure.

HIV/AIDS erode the resilience of rural livelihoods by undermining the coping strategies applied by households to maintain economic viability (Rugalema, 1999). Morbidity and mortality have negative effects on dependency of household members. Food security coping strategies depend critically on labour availability, skill, knowledge and experience (FANTA, 2000). Coping strategies are significantly constrained by morbidity and mortality. Labour

scarcity means that affected households face increasing difficulties in pursuing labour-intensive coping strategies, including labouring for money and collecting wild foods (FANTA, 2000).

Rugalema (2000) found that adult mortality results in household dissolution and orphans. Survivors leave the household and join other households largely due to economic and social insecurities resulting from loss of a key household member (Rugalema, 2000). Many food security coping strategies need skill, experience and a positive outlook on the future. An important skill for food security is knowledge of wild foods and how to prepare them, which is handed down from mother to daughter (de Waal and Whiteside, 2003). If young women do not have this key knowledge, they may go hungry because of ignorance. More broadly, planning a yearlong strategy for a household to feed itself and protect the basis of its livelihood, requires experience about income generating activities, planning skills and networks that may be absent as a result of mortality.

De Waal and Whiteside (2003) noted that one of the main factors impoverishing rural Africa was the burden of providing care for orphans and sick adults. Women carry the burden of care in addition to other livelihood activities. Morbidity and mortality reduce the effectiveness of coping strategies. For example, reducing food consumption may be nutritionally unsustainable for sick household members and therefore dangerous (de Waal and Whiteside, 2003).

Overall, the effects of morbidity and mortality on household coping strategies illustrate the likely burden that morbidity and mortality exert on household finances and how these may push households deeper into poverty by means of rising indebtedness as a result of borrowing.

2.10 Sustainable livelihoods as an analytical framework

It is difficult to discuss food security independently of wider livelihood and poverty considerations because of their linkages (van Liere, 2002). The analysis of the sustainable livelihoods framework is used in the development of indicators to measure the impacts of HIV/AIDS on households and food security. This framework posits that households possess five sets of livelihood assets, capabilities and activities through which they seek to earn their living. Each of the five capital assets - human, financial, natural, social and physical capital - is demonstrated to be impacted by the HIV/AIDS epidemic. Indicators to identify and measure the effects of the epidemic on these capital assets are important to the development of more effective mitigation strategies and programmes (FAO, 2003). This section made use of the livelihoods approach to give insight on the impact of HIV/AIDS on the livelihood assets. Figure 2.4 shows the sustainable livelihoods framework and the inter-relationship of the five types of capital shown in the asset pentagon.

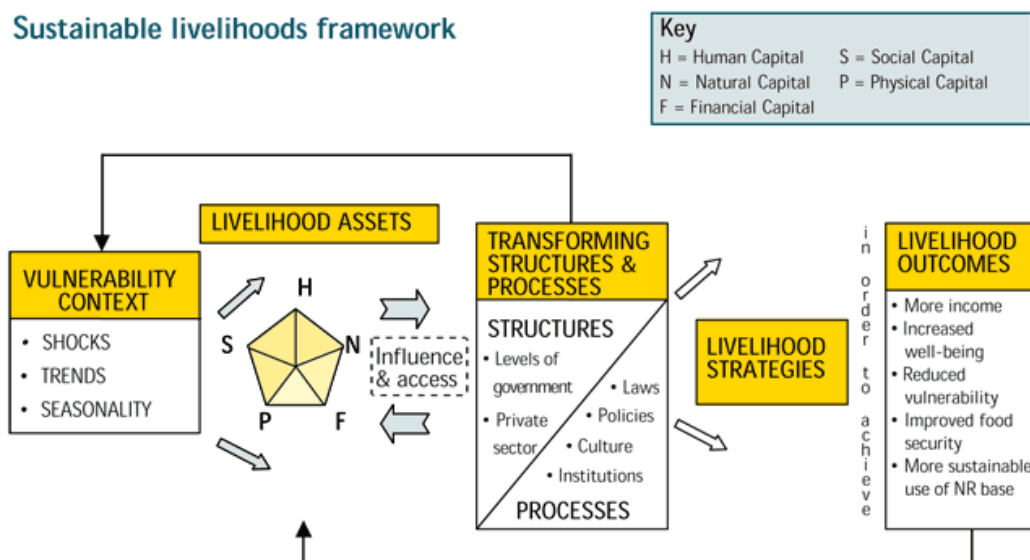


Figure 2.4: Sustainable livelihoods analysis framework (DFID, 1998: 5).

Figure 2.4 is a standard linear representation of the DFID sustainable livelihoods framework. However, the relationships are not just linear, but complex and integrated. The arrows within the framework are used to denote a variety of different types of relationships, all of which are highly dynamic. None of the arrows imply direct causality, though a certain level of influence is implied. The framework is not intended to depict reality in any specific setting. It is rather intended as an analytical structure for understanding the complexity of livelihoods, influences on livelihoods and identifying interventions to be made. The sustainable livelihoods approach is demonstrated to provide a delimited set of capital assets likely to be affected by morbidity and mortality. These capital assets are a means to achieve livelihood security and vary in kind and potential for meeting complex and unique needs of individual members (Deacon and Firebaugh, 1988). In the framework of sustainable livelihoods, assets include social capital, human capital, physical capital, natural capital and financial capital (DFID, 1998; DFID, 2002; Ellis, 1999).

Du Toit and Ziervogel (2004) asserted that many coping strategies were determined by the access that individuals and households have to a range of resources, including information, money, food, natural resources and employment opportunities. These are negotiated through the social capital of livelihoods that determine who has access to what resources and information. Thus, social capital can be defined as the social networks and associations to which people belong (Ellis, 1999). On a social level, households have to deal with stigmatisation, social exclusion and disintegration of family structure and social support networks. Stigma and discrimination are caused by ignorance and fear of AIDS as well as the moralistic and often judgmental views community members including PLWHA have about AIDS (Wijngaarden and Shaeffer, 2005). The social capital of households operating through their relationships with extended kin and the community is critical for their ability to recover

from the illness and/or death of a household member due to HIV/AIDS (Stokes, 2003). The stigma attached to HIV/AIDS is not conducive to the establishment of strong social ties and therefore weakens social networks resulting in affected households leaving independent of the community and becoming less resilient to recover from the shock of death or illnesses (Haddad and Gillespie, 2001).

Another social impact of the AIDS epidemic is that it robs the family of its social security system (May, 2003; Wijngaarden and Shaeffer, 2005). Together with the economic and emotional net by children and young people, the disintegration of the family cause negative impacts to the family. This means that children in families affected by AIDS have to put up with living under the care of extended family members or even foster family care. They may have to relocate from their familiar neighbourhood and siblings may be split, all of which can harm their development. This may result in them not being well-trained as would be in a nuclear family setting, which could lead them into crime, early sex or attaching themselves to gang groups (Wijngaarden and Shaeffer, 2005). The change in living arrangements, well-being and opportunities for a secure future for children is one of the most significant long-term outcomes of the HIV/AIDS pandemic.

Human capital comprises health, education and labour of household members (Ellis, 1999). It is the total of human resources, all capabilities and traits that people use to achieve their goals and other resources. Human capital impacts are identified as central to any effort to measure effects of the epidemic because declines in human capital reverberate throughout the other capital assets (FAO, 2003). Therefore, the most immediate impact of HIV/AIDS is on the human capital base, principally in terms of the availability and allocation of labour (Stokes, 2003). At the household level, the HIV-afflicted patient's labour input gradually diminishes as the patient succumbs to sickness. The labour of other household and extended family

members is often diverted to care for AIDS patients especially at the time when the patient becomes incapacitated before death. It is estimated that an HIV/AIDS-afflicted household may lose about two person-years of labour by the time of the death of the patient. The ultimate death of a productive member of the household constitutes the permanent loss of one source of labour (Hlanze et al, 2005).

To clarify the above mentioned points, a study conducted in four districts of Swaziland indicated that HIV/AIDS affects all aspects of human capital i.e. labour, skills/knowledge and health, all of which are important in pursuing sustainable livelihoods (Hlanze et al, 2005). The increase in morbidity and mortality in the communities studied resulted in the loss of labour for household and agricultural purposes. HIV/AIDS was more prevalent among the youth and able-bodied members of the communities. Illness or death of a member meant that a household had fewer members for agricultural production. In some communities, this resulted in low agricultural production or no farming. As a result, households that failed to farm had no food available implying that they were food insecure.

HIV/AIDS also has a number of impacts on orphans. Orphans have fewer opportunities and present greater challenges to the accumulation of human capital in terms of skills and education. Illness or death of a parent causes children to spend time away from schooling towards care-giving, house chores and working to supplement the family income. Furthermore, having a person living with HIV/AIDS (PLWHA) in a household means a greater amount of time and financial resources are channelled towards medical care, leaving fewer resources available for schooling and other investments (Corrigan et al, 2005). Consequently, inadequate education will deepen poverty and inequality which will expose orphans to risky survival activities such as prostitution, increasing their susceptibility to HIV/AIDS.

Financial capital is an important asset in sustainable livelihoods. Financial capital includes money, credit, stock and assets that can be converted to cash (Ellis, 1999). The loss of human capital leads directly to a loss of financial capital. Incomes obviously decline as HIV infections and AIDS deaths are disproportionately concentrated in the most productive age groups (15-49). Income thus declines from both farm and off-farm sources, further rendering the household vulnerable to food insecurity (FAO, 2003). As productive assets are sold off (see Physical Capital below), the household's future livelihood is jeopardized. Topouzis and du Guerny (1999) note that households respond initially by disposal of insurance assets that are reversible, including liquidating savings, seeking remittances from the extended family and borrowing from informal or formal sources of credit. If necessary, the sale or disposal of productive assets typically follows use of these sources of support. Hence, while poverty contributes to the incidence of HIV/AIDS, at the same time, AIDS creates poverty as resources are spent on caring for the patient and maintaining the household (Munthali, 2002).

Natural capital is the natural environment that provides a number of assets that can be converted to resources such as air, rain, water, land, rivers, forests, wild plants and animals. Household's use and preservation of natural capital may primarily be caused by the loss of human and financial capital. Deterioration in the natural capital is due to lack of labour and finances. There can be a decrease in the biodiversity due to asset stripping, selling of firewood and increased harvesting of wild foods as households try to cope with the shock caused by HIV/AIDS (FAO, 2003). Lack of labour leads to reduced terrace maintenance, reduced maintenance of soil fertility or irrigation channels. Many of these activities are labour intensive and have implications for long-term natural resource maintenance (van Liere, 2002). Households can go on to sell their land and livestock leaving them more vulnerable to future shocks and creating chronic poverty as resources for coping with illness

and mortality are reduced and this further undermines long term prospects for food security and household well-being (Stokes, 2003; Cohen, 1998).

Households' physical capital refers to those tangible assets and producer goods, which includes housing, household goods, furniture, tools and equipment, as well as livestock. Households attempt to conserve their productive resources in distress situations for as long as possible, but once savings and credit resources are exhausted and liquid assets have been disposed of, households resort to selling of other assets (Stokes, 2003). HIV/AIDS may lead to the neglect of infrastructure e.g. maintenance of wells, housing and roads due to lack of labour as these activities require intensive work force (van Liere, 2002). According to Haddad and Gillespie (2001) these basic infrastructure and productive equipment, used for the pursuit of livelihoods are threatened by HIV/AIDS, which has a negative impact on the livelihood of people and hence affect food security.

2.11 Summary

AIDS is a shock with very specific characteristics. Evidence from around Africa show that HIV/AIDS epidemic cause detrimental effect within households and the community. Although a limited number of studies have focussed on households, from the studies available it is clear that the epidemic disintegrates the family structure. While it affects both the rich and the poor, it is the poor who are most impacted. Whereas poverty may increase an individual's susceptibility to infection by HIV/AIDS and vulnerability to its physical, social, and economic impact, HIV/AIDS itself is not *ex ante* linked with poverty. The impact of HIV/AIDS on household food security cannot be separated from its effects on livelihoods. All the effects which HIV/AIDS has on the livelihood structure of a community, exposes it to food insecurity.

Households employ coping strategies to reduce the impact of HIV/AIDS. Governments, NGOs and the communities in which affected households live in also have a role to play in mitigating the impact of HIV/AIDS. A number of interventions have been made to reduce the impact of HIV/AIDS families although each intervention has its advantages and disadvantages. Many programmes are incorporated with income generating activities such as home gardens to improve self-sufficiency and self-reliance of affected households.

The literature reviewed in this chapter indicated that home gardening is a livelihood activity that households can rely on to supplement their food and income as it requires little or no capital to start. This means that even destitute households are able to start their home gardens. Empirical evidence of some successful home garden projects from other organisations which help PLWHA and their families also indicated how home gardening can be used to create self-reliance among HIV/AIDS affected households. The next chapter presents a description of the study area and the activities done by Masibumbane Mission.

CHAPTER 3

DESCRIPTION OF THE STUDY AREA

3.1 Overview of South Africa

South Africa has one of the highest HIV prevalence rates in the world (Thurlow et al, 2009). An estimated 5.7 million people were living with HIV/AIDS in South Africa in 2009, more than in any other country. Prevalence is more than 15% among those aged 15-49, with some age groups being particularly affected. Almost one-in-three women aged 25-29, and over a quarter of men aged 30-34, are living with HIV (UNAIDS, 2010). HIV/AIDS undermines economic growth in South Africa. In a study by Thurlow et al (2009), they found that HIV/AIDS lowers the GDP growth rate by 1.42 percentage points per year.

The World Bank (2000) categorised South Africa as a middle income developing country with a *per capita* income similar to Brazil or Malaysia, but ranks lower than these countries in terms of its Human Development Index (HDI). This is due to the grossly unequal distribution of income, wealth, opportunities and services (World Bank, 2000). South Africa has one of the most unequal income distributions in the world with a Gini coefficient of 0.6 where the experience of majority of South African households is either one of outright poverty or of continued vulnerability to becoming poor or poorer. Approximately 40% of South Africans live in poverty, with the poorest 15% in desperate struggle to survive (Landman et al, 2003).

3.2 Description of KwaZulu-Natal

KwaZulu-Natal is the second largest province of South Africa and home to about one fifth of South Africa's population. Thurlow et al (2009) noted that KwaZulu-Natal is the province that is most afflicted by HIV/AIDS in South Africa. Stats SA (2011) indicates that KwaZulu-Natal is the third poorest province in South Africa. The poverty level in the province was at 28.8% in 2011 (Stats SA, 2011). They added that approximately 70% of the poor may be dynamically so, unable to alleviate poverty. The Gini coefficient also increased from 0.515 to 0.543 during the same period, showing an increase in inequality in the province (Hoogeveen and Özler, 2005). Figure 3.1 shows the map of KwaZulu-Natal Province.



Figure 3.1: Map of KwaZulu-Natal

3.3 Description of the study area: an overview of Mpophomeni

This study on the food security status of HIV/AIDS affected households was conducted in a peri-urban area known as Mpophomeni Township in KwaZulu-Natal. Mpophomeni which means “home of the falls” is located outside Howick, 120km west of Durban (Masibumbane, 2007). It was established in 1972 to provide housing for people who were moved from the areas of Howick West, Cedara, Merrivale, Zenzele Location, Tweedie, Lion’s River and Lidgetton (Mathambo and Richter, 2007).

The population of Mpophomeni was estimated to be about 25,732 in 2011 (Stats SA, 2011). In the same year, the level of unemployment in the Mpophomeni Township was speculated to be more than 80%, with those in formal employment working in Howick, Pietermaritzburg and Durban (Masibumbane, 2007). Access to services is described as good as there is a clinic, community hall, a library and a number of schools. The supply of housing has seemingly not kept up with population growth and the resulting demand for housing. Roads in some parts of the township are not tarred, but access to electricity and water is good. There are, however, certain parts of the township still dependent on communal taps. Mpophomeni, marketed as part of ‘Zulu tourism experience’, is surrounded by waterfalls and is close to the Midmar Dam (Mathambo and Richter, 2007).

Mpophomeni Township was purposively selected to be the study area for three main reasons. First, the area has a very high unemployment rate speculated at 80% and the poverty level is high. Second, HIV prevalence is high, and this is largely attributed to oscillatory migratory labour patterns. At one time, up to 25 people were dying a week due to HIV/AIDS or other related illness (Masibumbane, 2007). Third, a number of organisations which help families to mitigate the HIV/AIDS impact exist there, they include: Friends for Life, Stay Together,

Hlanganani, Isibani, Masibumbane, Sakhisizwe, Zenzeleni, and Zibambeleni. From these organisations, Masibumbane was purposively selected because of their involvement in home gardening projects. Figure 3.2 shows the location of Mpophomeni.

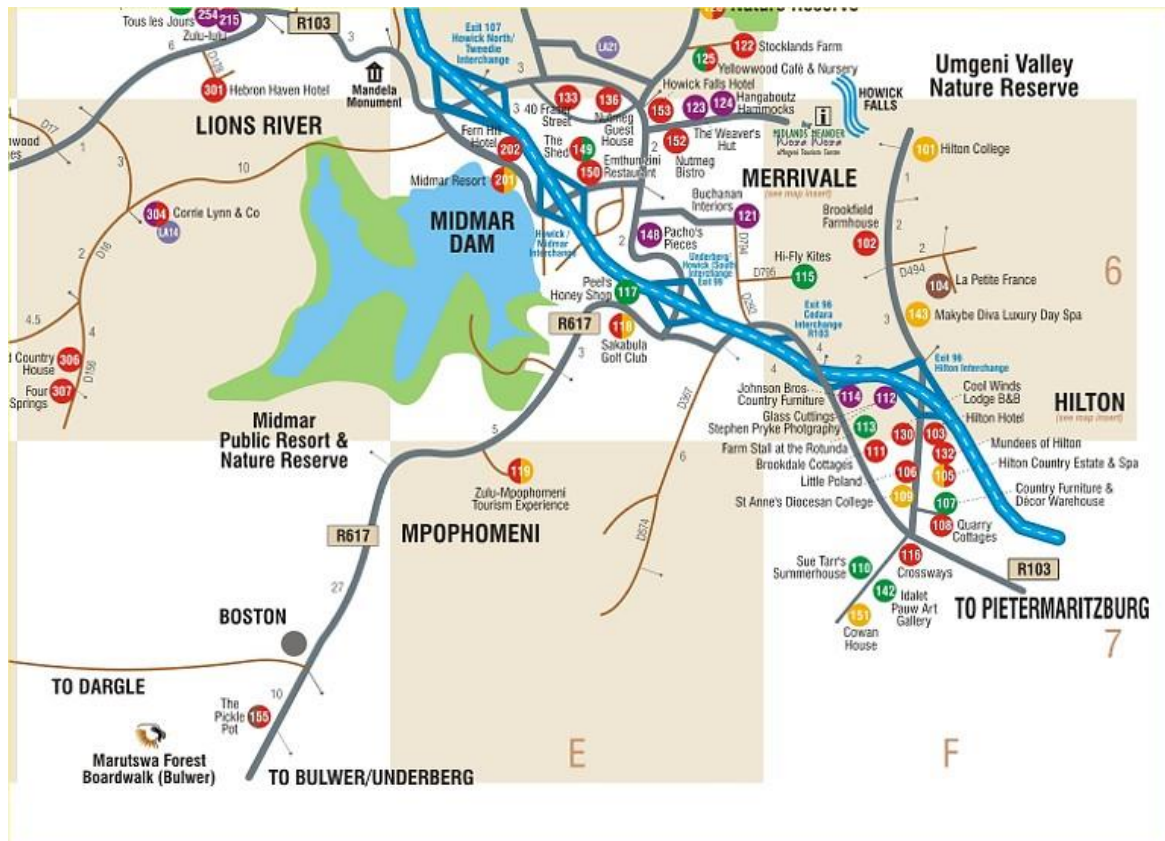


Figure 3.2 Location of Mpophomeni Township (Kwa-Zulu Natal Tourism Authority, 2010).

3.4 A brief overview of Masibumbane HIV/AIDS Mission

Masibumbane HIV/AIDS Mission is a registered Non-Profit and Public Benefit Organisation made up of Christians from various church denominations who have felt called to serve people living with HIV/AIDS. The Mission endeavours to give substance to the teaching of Jesus Christ and to care for those in need. Their mission statement is “providing sustainable,

holistic care for people with HIV/AIDS and empowering HIV/AIDS-affected families and orphans to be self-reliant” (Masibumbane, 2007).

In line with Masibumbane’s mission statement, eleven projects have evolved for the holistic care and empowerment of the clients and their children. This study examines only one of these projects - home gardening. The aims of the home garden project are to improve household food security and to provide a means of income generation to ensure self-reliance (Masibumbane Mission, 2007). Clients are taught to make a small organic garden that can provide sustainable supply of spinach, kale, cabbage, carrots, turnips, beans or peas within 12 weeks. In summer, the garden often provides additional income to households from selling excess produce.

CHAPTER 4

RESEARCH METHODOLOGY

Issues concerning illness and death are generally sensitive topics to discuss. This is particularly so in the case of HIV/AIDS, which is still highly stigmatised in South Africa. The stigma associated with the disease renders people unwilling to discuss or give AIDS-related information, particularly about household members. Therefore, it was decided to focus this study on Masibumbane HIV/AIDS Mission whose aim is to serve people living with HIV/AIDS.

Furthermore, research on HIV/AIDS raises ethical concerns because research participants accept risks and inconvenience primarily to advance scientific knowledge and to benefit others. Although some research offers the prospect of direct benefit to research participants, most research does not (Beauchamp and Childress, 1994). Wolf and Lo (2000) noted that there were three widely recognised principles that applied to research in HIV/AIDS: respect for persons, beneficence and justice. Respect for persons entails respecting the decision of autonomous persons and protecting persons who lack decision-making capacity. Beneficence imposes a positive obligation to act in the best interests of the research participants while justice requires that people be treated fairly. Wolf and Lo (2000) and Beauchamp and Childress (1994) stated that the principles of respect, beneficence and justice provided an appropriate ethical framework in conducting HIV/AIDS related research. Similarly, the South African Department of Health (2000) noted that research on HIV/AIDS topics involved complex ethical challenges such as: an informed consent, confidentiality, autonomy of participants, access to HIV related medication and the release and publication of research findings. For example, informed consent may be difficult to achieve, especially when

engaging people from disadvantaged and vulnerable communities where literacy and education opportunities are inadequate (Department of Health, 2000). Nevertheless, every effort needs to be carried out to obtain informed consent. Thus the many tensions, dilemmas and ethical considerations surrounding HIV/AIDS research necessitate a wide consultative process. Participants were consented regarding willingness to participate in the study. Appendix A shows the informed consent form.

4.1 Research design

Both quantitative and qualitative research methods were applied in this study. Quantitative research is defined as "the numerical representation and manipulation of observations for the purpose of describing and explaining the phenomena that those observations reflect" (Babbie 2009). Qualitative research is described as "the non-numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns of relationships"(Babbie 2009). An advantage of using quantitative data is that numbers form a coding system and systematic changes in scores are interpreted or given meaning in terms of the actual world that they represent. Another important advantage of numbers is that they can be analysed using descriptive and inferential statistics (Bless et al, 2006).

However, some information cannot be quantified, leading to the use of sentences and words. Qualitative research aims to describe in detail what is on the ground, giving the researcher more understanding and sufficient knowledge on the topic being researched. Bless et al (2006) state that a comprehensive study uses both quantitative and qualitative methods as the line between them is somewhat blurred.

4.2 Selection of the study sample

Masibumbane Mission has 55 clients and of these, 23 participate in a home gardening project. Purposive sampling was used to select the study sample because certain important sections of the target population were intentionally represented namely PLWHA participating in the home gardening project. Purposive sampling is a deliberate non-random method of sampling, which aims to sample a group of people, or settings with a particular characteristic, such as where they live in society, or specific cultural knowledge (Bless et al, 2006). The power of purposive sampling lies in selecting cases with rich information for answering the study problem. Such cases provide insight into the issues of central importance to the research study (Patton, 1990). Although purposive sampling has disadvantages in terms of statistical precision, it was the appropriate method for study sample selection. There were 23 functional gardens and the whole population was engaged in the study.

A control group of 10 households affected by HIV/AIDS not participating in home gardens was constructed to enable the researcher reach concrete conclusions after comparing these two groups. For the selection of the control group, accidental sampling method was used. This non-probability sampling method involves drawing a sample from a part of the population that is on hand i.e. a sample population selected because it is readily available and convenient (Bless et al, 2006). The Masibumbane mission clients meet on Tuesdays and Wednesdays at the mission office to collect their food packs. The sample was drawn from the people who came in and were willing to participate in the study.

Interviews with four key informants working on the home garden project were conducted. These were purposively selected as they were the ones working on the home gardening project. These key informants were the founder of the project, the Project Coordinator, and

the two field workers who provide clients with the necessary training before embarking on the home gardening and help them start their own home gardens.

4.3 Data collection

A household survey questionnaire that included both quantitative and qualitative questions was used to collect information from the participants. A seasonal calendar helped the study participants note the distribution of their garden produce throughout the year and helped the key informants identify months of greatest need for food parcels containing vegetables. Focus group discussions with randomly selected participants were also used to complement or add on to the information given at household level.

Before administering the questionnaires to the respondents, a pre-testing exercise was done on the key informants. This was to make necessary corrections and remove ambiguities before administering the questionnaires to the target population. Data were obtained through interviews using structured, interviewer-administered questionnaires to avoid misinterpretation or misunderstanding of words or questions and to ensure that respondents did not omit any question. By having the questionnaires administered by the interviewer, also meant that information was obtained from respondents who could not read or write (Levy and Lemeshow, 1991).

The household survey questionnaire (Appendix B) was designed to collect the following information:

- Household demographic information: age, gender and level of education of head of the household;

- Socio-economic characteristics: demographic data (household size), sources of income, sources of food, expenditure patterns;
- Information on home gardens: size of home garden, consumption frequencies etc
- Household Food Insecurity Access Scale to measure the household food insecurity access score

Interviews were held with the key informants to have an understanding of how the home garden project was started and the criteria used to select the participants. Unlike questionnaires, interviews enable the research to make adjustments on the questions in case where they were not relevant for a particular group (Appendix C).

A focus group discussion is a type of interview where about four to eight respondents are interviewed together (Bless et al, 2006). A focus group meeting can be conducted in an unstructured or semi-structured way. In this study, a list of questions for discussion among the participants was drawn up (Appendix D). Two group discussions were conducted for this study. The first had eight participants with home gardens and the other had six participants with no gardens. These two groups comprised of people who had participated in the household survey and were willing to participate in the focus group discussion.

Seasonal calendars are an extended version of the crop calendar representing all the major changes within the year, such as rainfall patterns and other major climatic changes, cropping, livestock cycles and labour demand. In this study, a seasonal calendar was used to draw a record of the vegetables grown in the gardens and their availability over the year. This helped in identifying periods when there was a lack and abundance of produce and identified the problems associated with planting each vegetable.

4.4 Data analysis

Both qualitative and quantitative analysis methods were used to answer the research question. The qualitative technique was in the form of comprehensive statements and analytical descriptions to consider several realities. The quantitative technique was mainly based on diagrams such as graphs and tables. Data analysis was sequenced to address the sub-problems of the study. Table 4.1 shows the data collection tool and data used for each sub-problem. The Statistical Package for the Social Sciences (SPSS) version 15-computer application software was used for the quantitative analysis of the primary data. Demographic data from the questionnaire (Appendix B, Sections 1 and 2) were coded and entered into the SPSS program and descriptive statistics was done. These results gave the general characteristics of the respondent households. From these analyses, Tables and Charts depicting distributions of respondents were generated and the results were presented in Chapter 5.

Table 4.1: Tools of data collection and data used for each sub-problem

Sub-problem	Tool of data collection	Data used
Are the participants of home gardens food secure as determined by the Household Food Insecurity Access Scale (HFIAS)?	HFIAS questionnaire	HFIAS score
What are the factors which influence household food insecurity?	Household survey questionnaire HFIAS questionnaire Focus group discussion	HFIAS score Household socio-economic characteristics
Do the consumption frequencies of home garden participants differ from those of non-participants?	Household survey questionnaire Focus group discussion Seasonal calendar	Consumption frequency score

To measure food security status of households, the HFIAS was used. The HFIAS is used to measure the impact of food security programs on the access component of household food insecurity. The method is based on the idea that the experience of food insecurity (access) causes predictable reactions and responses that can be captured and quantified through a survey and summarised in a scale (Coates et al, 2007; Kirkland et al, 2011). The HFIAS has nine questions. Each of the questions has a recall period of four weeks (30 days). These questions are based on a household's experience of problems regarding access to food in

three domains of food security (access) found to be universal across cultures (Coates et al, 2007). The domains represented are:

- Anxiety and uncertainty about the household food supply;
- Insufficient quality (includes variety and preferences of the type of food);
- Insufficient food intake and its physical consequences (Coates et al, 2007).

To ensure the validity of the questions to this community, several steps were taken to define the questions according to the community's perspective. The first step was to gather key informants, in this case, the care givers and runners of the project as they were familiar with the conditions and experiences of the household food insecurity (access) in the area of study. It was explained to the key informants that the household food insecurity (access) questions should be modified so that they match the culture of the community. For example, question one which says 'Did you worry that your household would not have enough food?' 'Household' can be defined as "people who live together and share food from a common pot" in one community and in another as "people who eat together and sleep in the same house." Second, the defined terms were further refined to ensure that the questions were understood by the respondents. This was achieved by administering the questionnaire to about four individual representative of the population. Finally, the improved questionnaire was used to draw information from the participants of the study (Coates et al, 2007).

The HFIAS consists of two types of related questions. The first is the occurrence question and the second is the frequency of occurrence question. Each participant was asked whether any of the nine questions related to their situation. If they experienced the issue, they were asked the frequency of occurrence question that is if it had occurred rarely (once or twice in the past month), sometimes (three to ten times in the past month) or often (more than ten times in the past month). The scale ranges from zero - which is never - to 3 which is often so

that the lowest possible score will be zero and the highest 27. The higher the score the more food insecure the household is (Coates et al, 2007).

$$\text{HFIAS Score (0-27)} = \text{Sum frequency code (Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8 + Q9)} \text{ ----- Equation 4.1}$$

The continuous scores were used to divide households into four categories representing food-secure, mildly, moderately and severely food-insecure according to the categorisation scheme recommended by the HFIAS Indicator Guide as shown on Figure 4.1 to give the Household Food Insecurity Access Prevalence (HFIAP) (Appendix E). HFIAP was used in addition to the average HFIAS score because the latter is a continuous variable and is more sensitive to capturing smaller increments of changes over time than the former (Coates et al, 2007; Knueppel et al, 2009).

A food secure household experienced none of the food insecurity (access) conditions, or just experienced worry, but rarely. HFIA category = 1 if [(Q1a=0 or Q1a=1) and Q2=0 and Q3=0 and Q4=0 and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]

Question	Rarely	Sometimes	Often	
	1	2	3	
1				
2				
3				
4				
5				
6				
7				
8				
9				

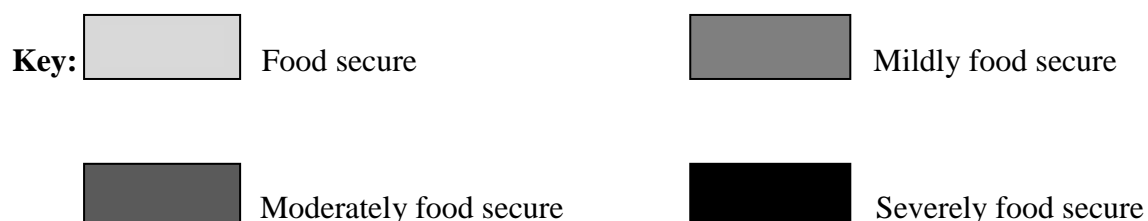


Figure 4.1: Categories of Household food insecurity (access) (Coates et al, 2007).

A mildly food insecure (access) household worried about not having enough food ‘sometimes’ or ‘often’, and /or ‘rarely’ ate a monotonous diet or less preferred food. The household did not cut back on quantity nor experience any of the three most severe conditions, going for a whole day without eating, going to bed hungry or running out of food. HFIA category = 2 if [(Q1a=2 or Q1a=3 or Q2a=1 or Q2a=2 or Q2a=3 or Q3a=1 or Q4a=1) and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0] (Coates et al, 2007).

A moderately food insecure household sacrificed quality more frequently by eating a monotonous diet or less preferred food ‘sometimes’ or ‘often’, and /or had started to cut back on quantity by reducing size of meals or number of meals ‘rarely’ or ‘sometimes’. HFIA category = 3 if [(Q3a=2 or Q3a=3 or Q4a=2 or Q4a=3 or Q5a=1 or Q5a=2 or Q6a=1 or Q6a=2) and Q7=0 and Q8=0 and Q9=0] (Coates et al, 2007).

A severely food insecure household had deteriorated to cutting back meal size or number of meals ‘often’, and/or experienced any of the three most severe conditions, going a whole day without eating, going to bed hungry or running out of food, even as frequently as ‘rarely’. Any household experiencing one of these three conditions, even once in the past 30 days was considered as severely food insecure. HFIA category = 4 if [Q5a=3 or Q6a=3 or Q7a=1 or Q7a=2 or Q7a=3 or Q8a=1 or Q8a=2 or Q8a=3 or Q9a=1 or Q9a=2 or Q9a=3] (Coates et al, 2007).

A linear regression model was used to identify factors which influence HIV/AIDS affected household food insecurity. The HFIAS score for individual households was used as the dependent variable and as a proxy for the household food security because the HFIAS score is a continuous variable and is more sensitive to capturing smaller increments of changes over time than the HFIAP (Coates et al. 2007; Knueppel et al. 2009). A higher HFIAS score is an indication that a household is food insecure. The model is expressed in its explicit form as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu$$

Where; Y = HFIAS food insecurity score

β_0 - β_n = model parameters

X_1 - X_n = socio-economic characteristics

μ = error term, which refers to the other variables affecting HFIAS score that were not included in the study.

Sub-question 3 will be measured using the Food Consumption Score (FCS). The FCS indicator measures the dietary diversity and food frequency. The FCS is a frequency weighted diet diversity score calculated using the frequency of consumption of different food groups consumed by a household during the 7 days before the survey (Wiesmann et al, 2009).

The following steps are used when calculating FSC:

- i. Using standard VAM 7-day food frequency data group all the food items into specific food groups. Groups are as shown in table 4.2.
- ii. Sum all the consumption frequencies of food items of the same group, and recode the value of each group above 7 as 7.
- iii. Multiply the value obtained for each food group by its weight (table 4.2 and creates new weighted food group scores.
- iv. Sum the weighed food group scores, thus creating the food consumption score (FCS).
- v. Using the appropriate thresholds as indicated in table 4.3 recode the variable food consumption score, from a continuous variable to a categorical variable.

Table 4.2: Standard Food Groups and standard weights used in all analyses

Food item (examples)	Food group (definitive)	Weight (definitive)
Maize, rice, bread, sorghum and other cereals Cassava, potatoes and sweet potatoes	Cereals and tubers	2
Beans, peas, groundnuts and cashew nuts	Pulses	3
Vegetables, relish and leaves	Vegetables	1
Beef, goat, poultry, pork, eggs and fish	Meat and fish	4
Milk, yoghurt and other dairy products	Milk	4
Sugar and sugar products	Sugar	0.5
Oils, fats and butter	Oil	0.5

Once the food consumption score is calculated, the thresholds for the FCSs should be determined based on the frequency of the scores and the knowledge of the consumption behavior in that country/region (Wiesmann et al, 2009).

Table 4.3: The typical thresholds of food consumption scores

FSC	Profiles
0-21	Poor
21.5-35	Borderline
>35	Acceptable

Two standard thresholds were identified by WFP to distinguish different food consumption level. A score of 21 was set as the minimum food consumption composed by an expected daily consumption of staple (frequency x weight, $7 \times 2 = 14$) and vegetables ($7 \times 1 = 7$).

- A score below 21, implies that the household is expected NOT to eat at least staple and vegetables on a daily basis and therefore considered to have “poor food consumption”.
- The second threshold was set at 35, composed by daily consumption of staple and vegetables complemented by a frequent (4 day/week) consumption of oil and pulses (staple x weight + vegetables x weight + oil x weight + pulses x weight = $7 \times 2 + 7 \times 1 + 4 \times 0.5 + 4 \times 3 = 35$). With a FCS between 21 and 35, a household is assumed to have “borderline food consumption” (Wiesmann et al, 2009).

CHAPTER 5

RESULTS AND DISCUSSION

This study set out to assess home gardening as a mitigation measure for food security of HIV/AIDS affected households in Mpophomeni Township, KwaZulu-Natal. This chapter presented analytical results which provided answers to the following sub-problems:

Sub-problem 1: Are the participants of home gardens food secure as determined by the Household Food Insecurity Access Scale (HFIAS)?

Sub-problem 2: What are the factors which influence household food insecurity?

Sub-problem 3: Do the consumption frequencies of home garden participants differ from those of non-participants?

5.1 Socio-Economic and Demographic Characteristics of sampled household

This section assesses the responses of household representatives participating in home gardening (n = 23) and non-participants of home gardens (n = 10) to questions in the questionnaire (Appendix B, Sections 1 and 2). More information about the households' food security was gathered through focus group discussions. Descriptive data of key variables of surveyed households are shown in Table 5.1.

Household surveys were conducted among 33 respondents. Sixty four per cent of the respondents were females and 36% were males. The mean age of the home gardeners was 49 years and 42 years for non-gardeners. This indicated that majority of household heads were

still in the productive age group and could engage in an income generating activity though some were too weak to do so.

The level of education was measured as the number of years completed at school by the household head. The average number of years completed in school by all households was 6.30. Education plays a crucial role in every economy. As a form of human capital, it contributes greatly to the livelihood of people (Casale and Whiteside, 2006). Education has the possibility of influencing household livelihoods options and also determines the income derived from the activities undertaken by the household. Low educational levels, poverty and inequality result in people exposing themselves to risky survival activities thereby increasing the susceptibility to HIV/AIDS (Casale and Whiteside, 2006).

Table 5.1: Socio-economic and demographic characteristics of sampled households (n = 33.00)

Variable	Mean		
	All households (n=33)	Households with gardens (n=23)	Households without gardens (n=10)
Age of household head	46.85	48.91	42.10
Number of years of completed school	6.30	6.48	5.90
Household size	4.52	4.74	4.00
Number of dependants	2.55	2.83	1.90
Household income per month (Rand)	760.09	891.17	458.60
Expenditure on food per month (Rand)	307.88	348.70	214.00

The average household size for the surveyed households was 4.52 compared to the country's average which was at 3.4 in according to 2011 census (Stats SA, 2011). If the household size is large the household may engage in home gardening because there will be sufficient labour to engage in gardening activities. However, if the household is relatively small due to migration or death of household members the incentive to engage in home gardening activities will be low as the quantity of labour available will also be low. The size of the

household, number of household members and working members captures the quantity of human capital.

The average monthly income for surveyed households was R760.09. For households with home gardens this average was R891.17, this was higher than for those without home gardens, which was R458.60. The average monthly expenditure on food for all the surveyed households was R307.88. This average was R348.70 for households with home gardens, which was higher than the R214.00 for households without home gardens.

Households with gardens differed from those without home gardens in terms of their food sources. As indicated in Table 5.2, households with home gardens had at least two sources of food and those without gardens relied on at least one source. The main food source for both groups was food donations which were in form of food packs from the Masibumbane Mission. Table 5.2 shows that 52.2% of households with gardens and 80% of households without gardens ranked food packs as their main food source. Masibumbane clients with a monthly income of less than R750 were given food packs on a weekly basis. In this study, 23 households (69.7%) indicated that they were getting food. These food packs contained beans, samp, rice, mealie meal, some fruits and vegetables (apples, pears and cabbage).

Table 5.2: Sampled households' food sources (n = 33.00)

Food sources	Food source ranks					
	With home gardens (%)			Without home gardens (%)		
	1	2	3	1	2	3
Purchasing	47.8	34.8	-	20.0	60.0	-
Food packs	52.2	8.7	4.3	80.0	-	-
Home gardens	-	56.5	43.5	-	-	-
Nothing	-	-	52.2	-	40.0	100.0
Total	100	100	100	100	100	100

Table 5.2 shows that 56.5% of the households with home gardens ranked home gardens as their second food source. The key informants indicated that all clients were being encouraged to have a home garden so that they could have direct access to fresh vegetables. The aim of having the home garden project was to provide food for the clients, encourage organic farming and to supplement the household income. As indicated in the literature, home gardens might not be the main source of food but a supplementary source which provides direct access to food (Wanasinghe, 2003; Marsh, 2004). To destitute families, home gardens can be the only source of certain nutrients (Hartivegsen and A'bear, 2004). The key informants also gave reasons why some households did not have home gardens. They mentioned that some clients show despondency, laziness and were negative about participating in the home gardening project. The physical condition of the client also had

great impact on their participation in home gardening. Clients who were bed-ridden and those who were weak did not participate in home gardening. Even so, those who had a family member willing to participate in the gardening project had a home garden.

For households without a garden, purchasing was ranked the second source of food by 60% and 20% ranked it their first food source. About 47.8% of households with gardens ranked purchasing as their first food source and 34.8% ranked purchasing as their second food source respectively. Table 5.1 indicated that the average amount of food expenditure was R307.88 which took up 41% of the total income. The greatest percentage of income was channelled to food expenditure.

Households in Mpophomeni had several sources of income as indicated in Figure 5.1. A high percentage (64%) of households relied on social grants i.e. child support grants and pensions for the elderly which were R250 and R1080 respectively in 2010. Child grants were paid to parents with children who are younger than 18 years old. Pensions were paid by the government to household members older than 60 years for females and 65 years for males.

Households who had foster children from deceased family members reported that accessing foster child grants was a problem because of the documentation required to receive this grant. Hunter and Adato (2007) reported that in the 2004 KwaZulu-Natal Income Dynamics Study the main reason why people do not apply for grants is the difficulty of obtaining documents, including the cost, time, complications, and difficulties accessing documents needed to obtain other documents.

The households acknowledged that government had recently made efforts to provide special grants for those infected with HIV but these efforts were short-lived due to the high level of corruption that is taking place. Unscrupulous people without HIV were taking advantage of

the situation and bribing hospital officials for CD4 count certificates and they would use them at the expense of those who are infected resulting in undeserving people getting the grant. The participants showed great concern on this issue and wished the government would address it soon so that the issuing of this grant may commence.

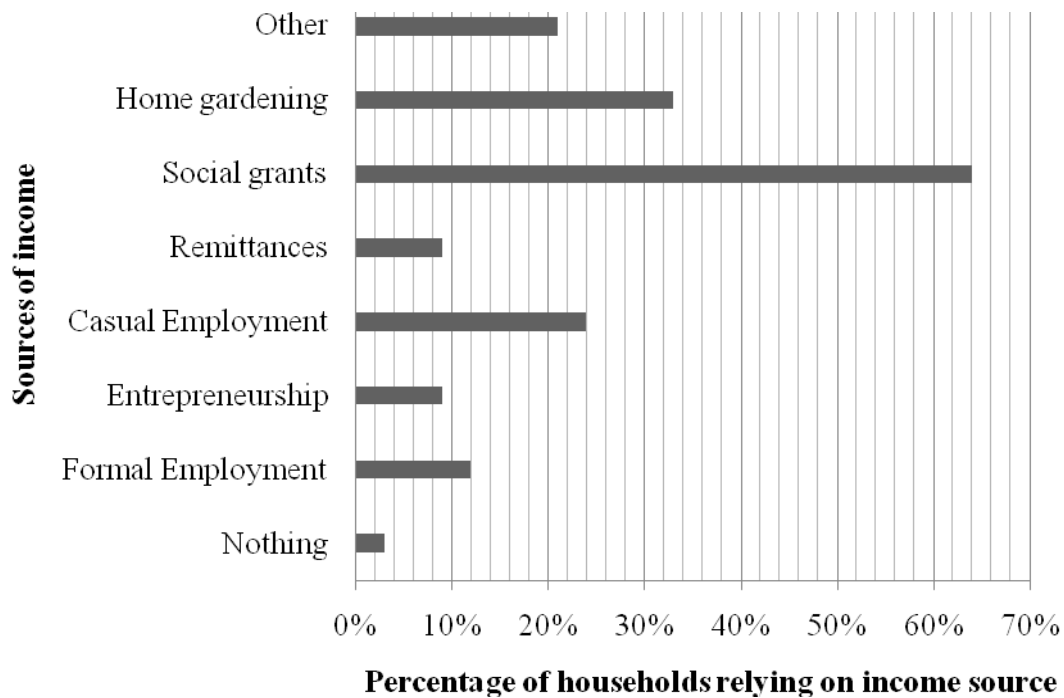


Figure 5.1: Income sources among sampled households (n = 33.00).

Apart from the social grants, some households had members who were employed. Twenty four per cent of the participants were involved in casual/part-time employment. Participants highlighted that casual employment was an unreliable source of income because the jobs were not always available; they relied on being called by people to do some work. Only 12% of the participants were formally employed with their monthly incomes ranging from R700 to R3 200. During the discussions, participants accentuated that unemployment, apart from sickness, was one of the problems faced by the community. Unemployment levels and

income poverty were very high in KwaZulu-Natal as compared to the national average with two fifths of the workforce unemployed (Thurlow et al, 2009).

The high unemployment rates and income poverty could be as a result of the education levels of participants. The participants' levels of education varied from no education to twelve years of schooling. About 19% of participants had never been to school. The average number of years of schooling was 6.30 years (Table 5.1). More than one fifth (20.8%) of individuals more than 20 years of age were functionally illiterate in 2011 according Census 2011 (Stats SA, 2011). In the same survey 28.7% attained education up to grade 12 and 11.7% proceeded to attain a qualification higher than grade 12. Since certain skills are acquired through secondary or tertiary education, from this survey more than half of the population completed up to primary level and therefore lacked skills that are necessary for them to engage in income generating activities thus the high level of unemployment.

The group with home gardens stated that although gardening generates income, it is not a stable source of income because of seasonality variations. Only 48% of the households with gardens obtained some income from home gardening. On average, the income was less than R100 per month. The group reported that they are seeking aid from the government or any organisation to provide seeds, tools, nets and tanks. The nets serve the purpose of protecting their crops from hail which severely damages crops. Tanks would be used for the purpose of harvesting water and supplement water supply in the garden in order to reduce the amount of tap water used.

Other sources of income were entrepreneurship in the form of running a creche and vending. Only 9% of the households had entrepreneurial activities as a source of income. About 9% indicated that they were receiving family support (remittances) whenever there was need. About 21% of the households had other sources of income which they specified to be

donations from the Masibumbane Mission. Money that households received from Masibumbane was used to cover transport costs to the hospital. About 60% of the households had two sources of income, 12% had three sources, 97% had at least one income source and 3% indicated that they did not earn an income. Total monthly income ranged from R0 to R3950 with an average monthly income of R760.09. The average household size was 4.52 (Table 5.1) giving a per capita income of R168.16 per month and R5.60 per day which is US\$0.80 (using US\$1=R6.88). One third of KZN's population was living below the poverty line of US\$2 per person per day in 2000 (Thurlow et al, 2009). Those without any income said they relied on food parcels given by the Mission and to travel to hospital they were also given bus fare by the Masibumbane mission.

Expenditure patterns varied from household to household. The main expenditures were for food, electricity, school fees, transport and burial insurance. Table 5.3 shows the monthly amount spent on the expenditures and their percentage to the total expenditure. As indicated in Table 5.3, food was the greatest expenditure for both groups although it was much higher for the households without home gardens (76%) than households which had home gardens (65%). The 11% difference could have been because households with home gardens did not spend any money purchasing vegetables as they already had them in their gardens. From the discussions, when asked where they got their vegetables, non-gardeners said that traditionally they got vegetables once a week from the local community garden and this was facilitated by Masibumbane mission and hence they were assured of vegetable supplies at least once a week. However they indicated that this was not sufficient so they had to purchase some in order to get through the week.

Table 5.3: Expenditure patterns of sampled households (n = 33.00)

Expenditures	Total monthly amount of expenditures			
	With gardens		Without gardens	
	Amount(R)	% of total expenditure	Amount(R)	% of total expenditure
Food	348.70	65.4	214.00	76.0
Burial cover	55.00	10.3	30.00	10.6
Electricity	60.00	11.2	15.00	5.4
School fees	20.00	3.8	10.00	3.5
Transport	49.52	13	12.70	4.5
Total	533.22	100	281.70	100

Due to the financial impacts posed by funerals, Masibumbane mission has made it a policy for its clients to have a burial cover as they are either affected or infected by HIV/AIDS. This is done so that the family of the deceased is not overwhelmed by burial expenses (Cohen, 1998). Approximately 10% of the total expenditure was for burial cover for both groups. Households also spent some money on transport, particularly those who had children who commuted to school. Although no medical costs were incurred by households because they use public hospitals particularly the one in Howick which provided free services, they had to cover transport cost to get there because most times their local clinic had no medication.

Electricity was also part of the expenditure. Households bought electricity depending on how much they used. Water was not part of their expenditure as every month they received one kilolitre free from the government and the condition was that they would pay if they exceed this limit. All the households in the study used water within the limits. School fees were the least of the households' expenditure as indicated in Table 5.3. No case of withdrawing children from school was reported for primary and secondary education but some households indicated that they were financially constrained to further their children's education to tertiary level due to the high costs of studying.

5.2 The distribution of food crops over the year

As discussed in the sections above, home gardening was a supplementary food and income source for the participants with home gardens. Table 5.4 shows the seasonal calendar for home gardeners in Mpophomeni Township. The seasonal calendar was used to show the distribution of food crops over the year.

The seasonal calendar of the homestead gardeners showed that they have vegetable supplies from their gardens all year round although the quantities differ monthly. The crosses in the calendar indicate the amount of crop that was harvested. The higher the number of crosses (x) the higher the harvest of the crop in a particular month. Gardeners indicated that spinach, cabbage, turnip and carrot were harvested throughout the year. Spinach is highly affected by frost so in the winter months (i.e. June and July) the harvests were low relative to the other months of the year.

Table 5.4: Seasonal calendar for home gardeners in Masibumbane Mission.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Spinach	xxxx x	xxxx x	xxxx x	xxxx x	xxxx	xxx	xx	Xxx xx	xxxx x	xxxx x	xxxx x	xxxx x
Cabbage	xx	xx	x	x	x	xxxx x	xxxx x	xxxx	xxx	xx	xx	xx
Turnip	x	x	x	xx	xxx	xxxx x	xxxx x	xxxx	xxx	x	x	x
Carrot	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Green beans	xxx	xxx	xx	x	x						xxxx x	xxxx x

Cabbage harvests on the other hand were indicated to be higher in the winter months and the gardeners indicated that in the summer months, too much water because of the rains cause cabbages to rot thus the low yields in summer. They added that cabbages are prone to pest attacks and these warm and wet weather conditions promote pest breeding again reducing the harvest of cabbages in summer. Turnips, just like cabbages, have high yields in winter and there is a reduction in harvest in the summer months. Carrot harvests are consistent throughout the year and the harvests do not increase because the gardeners prefer to consume carrots in small quantities. The participants said they harvest carrots throughout the year because it is easy to cultivate. On the other hand, green beans are harvested from November to May. During the dry season the green beans are left to dry up in the field and harvested as dry beans.

The members of Masibumbane that have home gardens were trained at Qendindlala community garden for three months. The training was done once a week and after

completion, they were assisted by the trainers to start their own home garden and were provided with inputs and fencing. The new home garden owner is supposed to remain accountable to the trainers and continue to get further assistance. Households cultivated plots in their homesteads from which they obtained food for consumption and some for supplementary income.

Home gardens were on average 23m² which is relatively small compared to the average size of a typical home garden, $\pm 150\text{m}^2$ (Nell et al., 2000). Water availability was unlimited as each household had tap water but they emphasized on their need for water tanks to store water in the rainy season so that they do not exceed the one kilolitre provided by the government when watering their gardens. Home gardeners indicated that although their gardens provided them an all year round vegetable supply, there were some uncertainties which reduced this supply. Rodents, theft and vagaries of nature were the problems mentioned by the gardeners.

5.3 Household Food Insecurity Access Scale Score (HFIAS score)

HFIAS score ranges from 0 – 27 (where 27 = most severe food insecure), and among the households surveyed the average HFIAS score was 9.82 with a minimum of 0 and a maximum of 27. Figure 5.2 shows the distribution of individual HFIAS scores across the households.

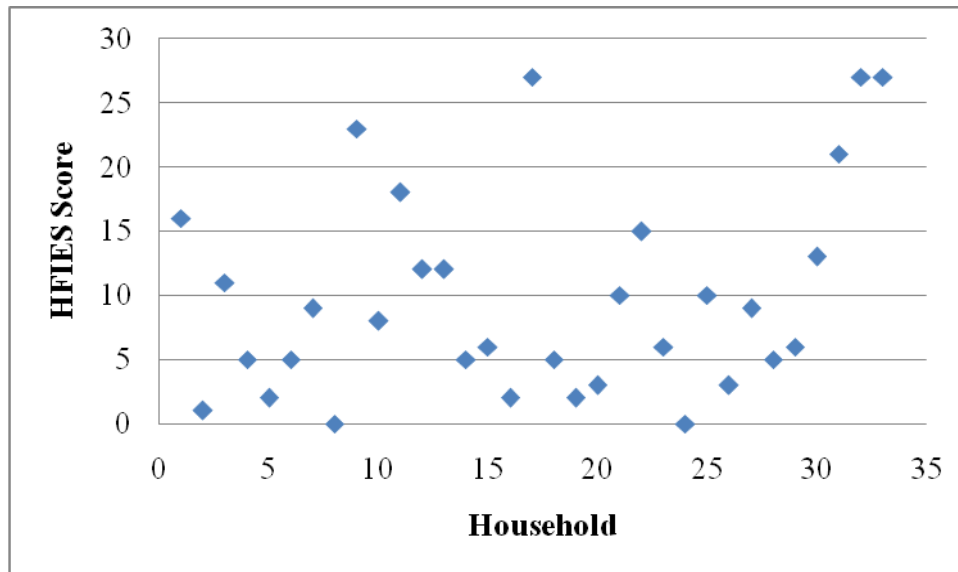


Figure 5.2: Scatter plot of the Household Food Insecurity Scale (HFIAS score) among participants (n=33).

5.3.1 The t-test for HFIAS score

There is no significant difference between the HFIAS score means of households with home gardens and those without home gardens. This is indicated in Table 5.5. This can be explained by the food sources of the two groups. Although it was stated in Section 5.1 that households with gardens differed from those without home gardens in terms of their food sources (Table 5.2) because home gardens is supplementary food source which provided direct access to food (Wanasinghe, 2003; Marsh, 1998) there was no statistically significant difference in the HFIAS score means of the two groups. This could be because the sizes of the home gardens were small and as a result did not provide much for the households to make a significant difference.

Table 5.5: T-test for the HFIAS

	Means		T-test	Level of significance
	With gardens	Without gardens		
HFIAS	9	12	-1.083 ^{NS}	0.287

Level of significance

^{NS} – Not significant

5.3.2 The result of the Regression analysis

A regression was used to determine the factors influencing the household food insecurity access scale (HFIAS) score. The HFIAS score was used as the dependent variable (Y) and X_1 – X_6 are the independent variables. The model is expressed in its explicit form as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \mu$$

Where;

Y = HFIAS score

X_1 = age of household head (years)

X_2 = number of years completed in school (years)

X_3 = household size (number)

X_4 = household monthly income (Rands)

X_5 = food monthly expenditure (Rands)

X_6 = participation in home gardening (Participant =1; Otherwise =0)

μ = the error term

The apriori expectations for the explanatory variables in the models are presented in Table 5.6.

Table 5.6: Apriori expectations for the explanatory variables used in the model

Variables	Definition and measurement	Expected signs
Age of household head	Age of household head in years	+/-
Education	Number of years of schooling (years)	+
Household size	Household size in numbers	+
Household monthly income	The amount in Rands received as remittances/grants/pension	+
Monthly food expenditure	The amount in Rands spent on food items in a month	+/-
Participation in home gardening	Dummy variable (D= 1 if participating, 0 if otherwise)	-

Based on apriori expectations

Table 5.7 summarises the estimates of the regression model. The table presents the beta coefficients (parameters) of the variables in the model, the t-test of the parameters and their level of significance.

Table 5.7: Estimated coefficients for the linear regression model for household food insecurity

Variables	Coefficient	Standard Error	t-statistics	Prob
Age of household head	0.058	0.149	0.390	0.070
Education	-1.132	0.557	-2.032**	0.041
Size of household	1.126	0.552	2.040**	0.013
Household monthly income	-2.101	0.764	-2.750***	0.005
Monthly food expenditure	0.105	0.062	1.682*	0.078
Home gardening	-0.154	0.091	-1.698*	0.102
Constant	0.109	0.226	0.482	0.063

***- indicate significance at the 1% level

** - indicate significance at the 5% level

*- indicates significance at the 10% level

The regression analysis was done to determine whether the selected factors were the major determinants of HFIAS score for the households in the study area. The results show that, out of the six variables included in the model, five variables were statistically significant. To ascertain the significance of the variables, three critical values or levels of significance were used and these are 0.01(1%), 0.05(5%) and 0.1(10%). Statistically, variable that has a level of significance value that is less than any of the critical values is considered significant at that level and if the significance level is greater than any of the critical values the variable is considered insignificant at that level of significant. Therefore values from the regression model in the Table 5.7 were interpreted as follows:

5.4 Factors influencing household food insecurity

The result of the linear regression model show that the coefficient of education measured by the number of years of schooling is statistically significant and negatively related to household food insecurity ($r = -0.334$, $P \leq 0.005$). This indicates that the more the number of years spent in school by the household head, the more food secure is likely the household. This could be attributed to the fact that education is expected to lead to increased earning potential and also influence the livelihood options meaning that the highly educated had high incomes and more purchasing power to buy food for their families. Gordon and Craig (2001) asserted that there are several forces that reinforce the effect of education on incomes; education increases skill levels required for some rural non-farm activities and contributes to increased productivity.

The coefficient of household size is statistically significant and positively related to household food insecurity ($r = 1.565$, $P \leq 0.005$). Households with large family size are more likely to be food insecure compared to those with smaller family size. A possible explanation for this could be the fact that most HIV affected households consist of extended family

members, which as in many developing countries is a source of support and care during illness especially HIV (Mwinituo 2006). Also majority of the households relied on food packs given by the mission. These packs often contain the same basic food items for all households irrespective of the its size and as a result, households with many members are food insecure as they had more mouths to feed and much pressure is exerted on the limited resources available at households level.

The coefficient of household income/remittances is statistically significant and negatively related to household food insecurity ($r = -0.386$, $P \leq 0.001$) indicating that as the income/remittances increase households become more food secure and the possibility of being food insecure decreases. Increasing incomes implied that households would have a higher purchasing power to buy food thereby ensuring that the household have access to food. According to May et al. (1995), diversified income base can help reduce household vulnerability to income shock and could be a proxy for household's ability to respond to economic changes. In South Africa, income has been identified as the principal determinant of household food security (Kirsten et al. 2003).

The coefficient of household food expenditure is statistically significant and negatively related to household food insecurity HFIAS ($r = -0.342$, $P \leq 0.01$) indicating that with an increase in household food expenditure, there is more likelihood that the household will be food insecure. This could be a result of the rising food prices which limit the quantity a poor HIV/AIDS affected household could purchase. Rising food prices, particularly of maize and wheat which are the staple of the poor pose serious problems to food security in South Africa, since most poor households are net buyers of food (Altman et al. 2009). Home gardening is a supplementary food production system and not the household's primary source of food.

However, the coefficient of household participation in home gardening is statistically significant and negatively related to household food insecurity, indicating that as households participate in home gardening there is a likelihood they become more food secure and the possibility of being food insecure decreases. A possible explanation could be that HIV/AIDS affected household cultivates a greater diversity of vegetables and consume more essential food items from their gardens, and surplus produce are sold to generate additional income for the households especially during the winter months. This is consistent with the findings in Ghana that home gardens contribute significantly to dietary diversity in HIV positive rural household (Akrofi et al. 2010).

5.5 The explanatory power of variables in the model

Table 5.8 summarises the regression model. In the summary the explanatory power of the variables in the model is presented and these are shown by the two **R-squares**.

Table 5.8: Explanatory power of variables in the model

Model Summary				
Model	R	R-Square	Adjusted R-Square	
1	0.692	0.683	0.601	

The explanatory power measures the variation in the dependent variable that can be explained by the changes in the independent variables. The result of the model indicates that R-square was 0.683 implying a degree of 68.3% relationship among the independent variable. The

adjusted R-square shows that 60.1% of the variables can explain the model and the higher the adjusted R-square, the more significant the model. Therefore, the variables significantly explained the model.

5.6 Household food insecurity access prevalence

Surveyed households were grouped into food security categories depending on their responses to anxiety and uncertainty about food supply and frequency of using household behaviours (Table 5.9). About 50% of the households without home gardens were severely food insecure. Greater percentage of households with home gardens, 39.1% were moderately food secure. Taken as a whole, Masibumbane clients were in the moderately food insecure and severely food insecure categories. From the focus group discussions, participants pointed out that food packs were making a significant impact in household food availability because they get a weekly supply from the Mission.

Table 5.9: Food security categories of sampled households in Mpophomeni Township (n=33).

Food security categories (Coates et al, 2006)	With Gardens		Without home gardens		Overall	
	Number of households	Proportion (%)	Number of households	Proportion (%)	Number of households	Proportion (%)
Food secure	1	4.3	1	10.0	2	6.1
Mildly food Insecure	5	21.7	0	0	5	15.2
Moderately food insecure	9	39.1	4	40.0	13	39.4
Severely food insecure	8	34.8	5	50.0	13	39.4
Total	23	100.0	10	100.0	33	100.0

5.7 The food consumption score

On a scale of 0 – 112 (112 = acceptable), surveyed households had an average FCS of 51.4. Figure 5.3 shows the distribution of individual FCS scores where household 1-23 were those with home gardens and household 24-33 had no home gardens. The minimum FCS for the households with home gardens was 22 and the maximum was 89 while the minimum FSC for

those without home gardens was 18.5 and maximum was 92. The minimum FCS for all surveyed households was 18.5 and the maximum score was 92.

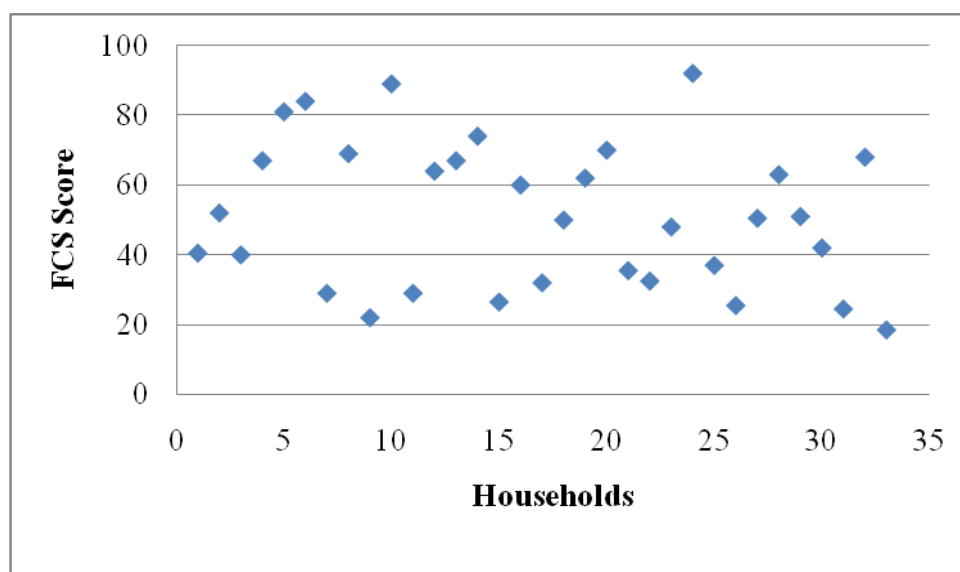


Figure 5.3: Scatter plot of the Food Consumption Score (FCS) of participants (n = 33).

From the data presented in the scatter plot and using the thresholds as indicated in Table 5.10, only 3% of the households surveyed fall into the poor profile. This means that the households were not eating at least staple and vegetables on a daily base and therefore were considered to have poor food consumption. Twenty-one per cent of the households had borderline food consumption while the remaining 75.8% had acceptable food consumption.

Table 5.10: Typical thresholds of food consumption scores

FCS	Profiles	Percentage of households
0-21	Poor	3
21.5-35	Borderline	21.2
>35	Acceptable	75.8

5.7.1 The t-test for food consumption score

There is no statistically significant difference in the mean food consumption scores for the two groups i.e. households with home gardens and households without home gardens as indicated in Table 5.11 by the t-test. This could be attributed to the food sources of the Masibumbane clients.

Although in section 5.1 it was stated that households with gardens differed from those without home gardens in terms of their food sources (Table 5.2) because home gardens provided a supplementary source which provided direct access to food (Wanasinghe, 2003; Marsh, 1998), there was no significant difference between the FCS means of the two groups. The main food source for both groups was the food packs which contained food items categorised as cereals, pulses and vegetables by the FCS Table (Appendix B, Section 1). FCS is a measure of the consumption score for each food group and because the home gardeners and non-gardeners received food packs, they both had to purchase food not contained in the food packs such as meat, milk, sugar and oil.

Table 5.11: T-test for the food consumption scale

	Means		t-test	Level of significance
	With gardens	Without gardens		
FCS	53	47	0.757 ^{NS}	0.455

Level of significance

^{NS} – Not significant

5.7.2 Household characteristics related to food consumption score

The relationships between household food consumption score and household characteristics are presented in Table 5.12. There is a positive statistically significant relationship between FCS and number of years completed in school ($r = 0.259$, $P \leq 0.01$). The relationship indicated that households with heads who had spent many years in school had a high food consumption score. This implies that the more number of years completed in school, the higher the food consumption score.

Household size, as indicated in Table 5.12 is statistically significant at 5% and the negative coefficient indicates that there was a negative relationship between FCS and household size. This means that an increase in the household size cause a decrease in the FCS. Households with fewer members experienced a higher FCS.

Table 5.12: Pearson's correlation between socio-economic characteristics and food consumption score for sampled households

Variable	FSC
	Correlation Coefficient
Garden	-0.135
Age	0.021
Years in school	0.259(**)
Household size	-0.307(*)
Income Source	-0.256
Household Income	0.307(**)

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

There was a positive correlation significant at 1% significant level between household income and FSC. As indicated in Section 5.7.1, household had to purchase some food items which were not provided by the mission therefore, the positive correlation means that an increase in the household income resulted in an increase in FSC. High incomes implied that households had high purchasing power and from earlier discussion, the greatest percentage of expenditure was on food i.e. 65% and 76% for home gardeners and non-gardeners respectively.

CHAPTER 6

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This study assessed the food security status of HIV/AIDS affected households participating in a home garden project in Mpophomeni Township, KwaZulu-Natal. The following key sub-problems were addressed:

- Are the participants of home gardens food secure as determined by the Household Food Insecurity Access Scale (HFIAS)?
- What are the factors influencing household food insecurity?
- Do the consumption frequencies of home garden participants differ from those of non-participants?

HIV/AIDS affected households are more vulnerable to food insecurity than non-affected households in terms of the impact HIV/AIDS has on their livelihood assets which are: social, financial, human, physical and natural. The introduction of home gardens as a mitigation response is aimed at ensuring household food security. Home gardens are suitable for HIV/AIDS households as they require low-input, are low-labour demanding, they are close to the homestead, and have a quick turn-over.

The data for the study was obtained using a questionnaire, seasonal calendars, focus group discussion and interviews with key informants. Questionnaires were used to collect data on household demographics, food consumption frequencies and responses to HFIAS questions among households participating in home gardening and a control group of non-participating

households in Mpophomeni Township. Seasonal calendars were used to draw attention to the vegetables grown in the gardens, their availability and distribution over the year. Focus group discussions and interviews were used to have an understanding of the food security levels of households and information about the home gardening project. Twenty-three home gardeners and 10 representative households without home gardens participated in the survey. All households with home gardens participated in the study and availability sampling was used to select representative households without home gardens but all participants are clients of the Masibumbane mission.

The HFIAS was used to examine the issue of food insecurity among Mpophomeni households. The HFIAS scores of the participating households' ranges from 0 to 27, with 34.8% of the households with home gardens and 50% of those without home gardens being classified as severely food insecure. Within the severely food insecure category, HFIAS could not give a guidance on the cut off point on the severity for intervention targeting purposes.

A regression model was used to determine the variables influencing the HFIAS. The results of the regression model showed that the number of years completed in school, household size, household income and total food expenditure had statistically significant effects on the HFIAS score. Even though there are differences in the severity of food insecurity between households with gardens and those without, there is no statistically significant difference between the HFIAS means for the two groups. This was attributed to their main food source and the household total income.

The t-test revealed that there was no statistically significant difference between the FCS means of households with home gardens and those without home gardens. Home gardening

did not have an effect on the FCS but some household characteristics were correlated to the FCS. Number of years completed in school and the household income had a positive correlation with the FCS. Thus implying that the more the number of years the household head completed in school the higher the FCS and the higher the households' income the higher the FCS. There was a negative correlation between the household size and the FCS meaning that the bigger the household size, the less the FCS. The FCS ranged from 18.5 to 92 and the majority (75.8%) had acceptable food consumption.

6.1 Conclusions

Households participating in the home garden project in Mpophomeni Township were generally moderately food insecure. Households depended on food packs as the main source of food and purchased some food items which were not available in the food packs such as cooking oil, meat and milk. Household incomes were low and irregular to maintain an adequate household food requirement. Majority of the households received social grants and these grants are the main income source for others. However, these grants are too small to meet the household food requirements. Some households are not benefiting from these social grants because of poor documentation, thereby making it difficult for them to cater their families. Formal employment provided a reliable source of income however, only 12% relied on it. Other sources of income such as remittances, income from home gardening and entrepreneurship were low and unreliable.

Home gardens, a supplementary food source to households were limited in terms of size and the overall crop productivity. Although there was vegetable supply throughout the year, the yields were low and unpredictable resulting in reduced availability of food to households. The low yields were attributed to the sizes of home gardens and vagaries of nature like frost, hailstorms rodents and insects.

Home gardens were insufficient to significantly contribute to household food security among households participating in home gardening in Mpophomeni Township. Although home gardens did not make a significant contribution to the food security status of gardeners in Mpophomeni Township, their input to food access may not be ignored. Improvement of home garden productivity could contribute significantly to household food security. Home gardens could be used for short term production of high value and nutritious crops which could increase household food diversity. Surplus crops could be sold and incomes used to purchase other food items such as meat and milk, thus increasing the total household food requirements.

6.2 Policy implications and recommendations for improvement of home gardens

Since the sizes of the home gardens varied from household to household, those with small gardens could increase their garden sizes in order to maximise the garden area. Apart from increasing garden sizes, yields from home gardens could be improved by increasing unit area production through the use of appropriate crop production methods provided by the project implementers and agricultural extension services. The use of improved seeds, inorganic and organic fertilisers and adequate pest and disease control could improve home garden crop production.

Planting of fruit trees around home compounds could significantly contribute to dietary diversity among home gardeners. Rearing of small animals such as rabbits and chickens could also improve food consumption scores of households, as the meat will be readily available. The project implementers need to make regular evaluations on the crop production and monitor the project for regular feedback and fine tuning of training and other needs.

It is also recommended that appropriate agricultural and nutritional education be given to home gardeners as this is essential for ensuring effective linkages between garden food availability and consumption and consumption and absorption by the body. The training of home gardening promoters and extension workers in both gardening techniques and nutrition education ensures that gardens are planned to provide a year-round supply of nutrient-rich foods that are compatible with local preferences.

The government could support agricultural extension services in the Mpophomeni Township so that home garden production can be improved through appropriate agricultural production methods. The government can also work closely with organisations caring for HIV/AIDS affected households such as Masibumbane Mission to identify people who are truly affected so that they can provide them with cash transfers for HIV/AIDS.

Other income generating activities such as sewing could be initiated to address household food security, as not everyone is interested in home gardening. Training can be provided for such people so that they start their sewing business as a community and be able to sell their products in nearby towns. The government could also provide a farm for the people of Mpophomeni as they had future prospects of venturing into large production of canned products from processed from their own farm produce.

6.3 Recommendations for further study

The HFIAS tool investigates three component of food insecurity namely: anxiety and uncertainty about household food supply; insufficient quality of food consumption and insufficient quantities of food consumed. Further study analysis could separate the sections in order to get an understanding of each component of food insecurity for home gardeners.

This study gave an understanding of the food security status of HIV/AIDS affected household in the Mpophomeni Township as related to food availability and access through home gardening. Further study could include the utilisation component among home gardeners. This could help in identifying the nutritional value of vegetables and their utilisation within the body.

This study involved only one organisation, there is need to conduct a study involving more than one organisation who are using home gardening as a mitigation tool for affected households. This could help in identifying the gaps which each organisation has and be able to implement methods and strategies used by the successful organisations to the failing ones.

A comparative time series study should be conducted to examine the food security status of home gardeners before their involvement in gardening and after. This study could quantify the contribution of home gardens to household food security in the Mpophomeni Township.

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APPENDIX A INFORMED CONSENT DOCUMENT

University of KwaZulu-Natal
Faculty of Science and Agriculture
African Centre for Food Security
Private Bag X01
Scottsville
3209
South Africa
3 May 2010

Research topic

Home gardening as a mitigation measure for food security of HIV/AIDS affected households in Mpophomeni Township, KwaZulu-Natal

We would like to ask you to participate in the research study of Kudzai E. Makwangudze who is doing her Master of Science in Agriculture (Food Security) from the African Centre for Food Security (ACFS) at the University of KwaZulu-Natal.

If you have any questions or concerns please feel free to contact:

Principal Researcher: Miss Kudzai E. Makwangudze

Email address: kudzimak@gmail.com

Contact number: 0738356349

Supervisor: Dr Lloyd Baiyegunhi

Email address: BaiyegunhiL@ukzn.ac.za

Contact number: 033 260 5437 (office)

079 554 6833 (cell)

Purpose of the study

The study seeks to evaluate food security status of HIV/AIDS affected households participating in the Masibumbane home gardening project by comparing their results with that of a control group, i.e. HIV/AIDS affected households who are not participants of the project. The sample will be drawn from people who are part of the Masibumbane Mission project. Food security is 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. Therefore, the study will be assessing the impact that home gardens have on food security status of participants. The purpose of the study is to find ways of optimizing the benefits of having home gardens.

What is required from you?

The study will require information on the household i.e. gender, age and income source of head of household, household size, number of dependants and participation in the home gardening project. This data be collected using a household questionnaire. Focus group discussions will also be conducted and data on the coping strategies will be collected. Coping strategies are the ways in which people use to adjust to a situation for example skipping meals when there is not enough food. The data will be collected between July and August 2010.

Potential benefits

The results will be given to the project coordinators so that they may know the impact of the home gardens and be able to improve to ideal home gardens which help in improving food security. The community will also be informed of findings and this will help in mobilising more people in the participating in home gardening project as well as to motivate the participants in continuing in it. Other stakeholders such as the government, the international communities and NGOs will also be informed on the importance of such projects in order to improve the livelihood of people living with HIV/AIDS. This could be a platform for funding of such organisations and missions by other outside parties.

Confidentiality

Every effort will be made to ensure confidentiality of any identifying information that is obtained in connection with this study. You will remain anonymous as codes will be assigned when capturing data on the computer. Data will be kept by the University of KwaZulu-Natal and be provided to any third party upon request and if the reason is linked to the home gardening project.

Participation and Withdrawal

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may exercise the option of removing your data from the study. You may also refuse to answer any questions you don't want to answer and still remain in the study. If you decide not to participate, you will not be prosecuted; neither will you face any disadvantages.

Declaration by participant

I..... (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project.

I understand that I am at liberty to withdraw from the project at any time, should I so desire.

SIGNATURE OF PARTICIPANT..... DATE.....

APPENDIX B QUESTIONNAIRE

FOOD SECURITY STATUS OF HIV/AIDS AFFECTED HOUSEHOLDS IN MPHOMPOMENI TOWNSHIP, KWAZULU-NATAL

We are carrying out a study on the above topic. We are kindly asking you to fill the required information in the questionnaire. All information will be treated in confidentiality. Thank you.

Questionnaire no.....

SECTION A: PERSONAL INFORMATION

Please mark (X) the appropriate box

1. DEMOGRAPHIC CHARACTERISTICS

- a. Gender of household head: Female ☐ Male ☐
- b. Marital status of household head: 1. Married ☐ 2. Single ☐ 3. Divorced ☐
4. Widowed ☐ 5. Other ☐ (specify).....
- c. Age of household head (years):
- d. Highest educational attainment of household head (years of completed schooling).....
- e. Number of household members.....
- f. Number of income-earners in household.....
- g. Number of dependents i.e. children >18 and elders <65.....
- h. Number of children attending school paid from own resources.....

2. RANK THE SOURCES OF INCOME

Source of income	Rank (1)main- (7)least	Monthly income (ZAR)
1. Formal employment		
2. Entrepreneurship (vending, crafting, sewing etc)		
3. Casual/Part time employment (skill services)		
4. Family remittances/support		
5. Social grants		
6. Gardening		
7. Other (specify)		

3. RANK THE SOURCES OF FOOD

Source of food	Rank (1)main-(4)least
1. Purchasing	
2. Home gardening	
3. Food aid/donations	
4. Other (specify)	

4. EXPENDITURE PATTERNS

Expenditures	Monthly amount (ZAR)
Food	
Medical expenses	
School expenses	
Transport expenses	
Other (specify)	

SECTION B: INFORMATION ON HOME GARDENS

☐ ☐

5. Do you have land for home gardening? Yes No

6. If **YES** to Q4, what is the size of the land (m²)?.....

7. What is the purpose of gardening? Home consumption ☐ Selling ☐ Both ☐

8. Average number of meals per days.....

9. CONSUMPTION FREQUENCIES PER WEEK

Food item (examples)	Food group	Days eaten per week
Maize, rice, bread, sorghum and other cereals Cassava, potatoes and sweet potatoes	Cereals and tubers	
Beans, peas, groundnuts and cashew nuts	Pulses	
Vegetables, relish and leaves	Vegetables	
Beef, goat, poultry, pork, eggs and fish	Meat and fish	
Milk, yoghurt and other dairy products	Milk	
Sugar and sugar products	Sugar	
Oils, fats and butter	Oil	

Table 1: Household Food Insecurity Access Scale (HFIAS) Measurement Tool

Question	Response options	Code
1. In the past four weeks did you worry that your household would not have enough food?	0 = No (skip to Q2) 1 = Yes	
1a. How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
2. In the past four weeks, were you or any household member not able to eat the kinds of food preferred because of lack of resources?	0 = No (skip to Q3) 1 = Yes	
2a. How often did this happen?	1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)	
3. In the past four weeks, did you or any household member have to eat a limited variety of foods due to	0 = No (skip to Q4) 1 = Yes	

a lack of resources?		
3.a How often did this happen	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
4. In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food?	<p>0 = No (skip to Q5)</p> <p>1 = Yes</p>	
4.a How often did this happen	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
5. In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food?	<p>0 = No (skip to Q5)</p> <p>1 = Yes</p>	

5.a How often did that happen	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
6. In the past four weeks, did you or any other household member have to eat fewer meals in a day because there was not enough food?	<p>0 = No (skip to Q7)</p> <p>1 = Yes</p>	
6.a How often did this happen?	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
7. In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food?	<p>0 = No (skip to Q8)</p> <p>1 = Yes</p>	
7.a How often did this happen?	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times</p>	

	<p>in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
<p>8. In the past four weeks, did you or any household member go to sleep at night hungry because there was not enough food?</p>	<p>0 = No (skip to Q9)</p> <p>1 = Yes</p>	
<p>8.a How often did this happen?</p>	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	
<p>9. In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food?</p>	<p>0 = No</p> <p>1 = Yes</p>	
<p>9.a How often did this happen?</p>	<p>1 = Rarely (once or twice in the past four weeks)</p> <p>2 = Sometimes (three to ten times in the past four weeks)</p> <p>3 = Often (more than ten times in the past four weeks)</p>	

APPENDIX C INTERVIEW QUESTIONS

1. When did the home gardening project start?
2. What is the aim of having the gardening project?
3. What criteria do you use in targeting the participating households apart from them being HIV/AIDS affected?
4. Are you getting any positive response from the participants concerning the home gardens?
Explain
5. Is the community supportive? If so, in what way?
6. In your view, how are the participants benefitting from home gardening?
7. Where do you get your funding from?
8. What are some of the challenges you face in implementing the home gardening project?
9. What would you do to help improve the output?
10. How sustainable is the home garden project?
11. Are there any prospects you have for the future in line with the home gardening?

APPENDIX D FOCUS GROUP QUESTIONS

1. In what way is the project helping you as a household?
2. What would you do to help improve the output?
3. Has there been a change in household income as a result of the garden?
4. Does the household feel its food supply is now more secure?
5. What are the factors which contribute to low productivity?

APPENDIX E HFIAS SCORE AND FOOD INSECURITY CATEGORY

HH	Coded Frequency of Food Insecurity Experience									HFIAS score	HFIAP—Food Insecurity Category
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9		
1	2	3	3	3	1	2	2	0	0	16	4
2	0	1	0	0	0	0	0	0	0	1	2
3	1	2	2	2	2	1	1	0	0	11	3
4	1	1	2	1	0	0	0	0	0	5	3
5	0	1	1	0	0	0	0	0	0	2	2
6	0	1	2	1	1	0	0	0	0	5	3
7	0	3	2	2	0	0	2	0	0	9	4
8	0	0	0	0	0	0	0	0	0	0	1
9	3	3	3	3	3	3	3	1	1	23	4
10	1	2	0	0	3	2	0	0	0	8	4
11	2	3	3	3	2	1	2	1	1	18	4
12	1	2	3	2	3	1	0	0	0	12	4
13	2	2	1	2	2	0	3	0	0	12	4
14	3	2	0	0	0	0	0	0	0	5	2
15	2	1	2	1	0	0	0	0	0	6	3
16	2	0	0	0	0	0	0	0	0	2	2

17	3	3	3	3	3	3	3	3	3	27	4
18	0	2	3	0	0	0	0	0	0	5	3
19	0	1	0	0	0	1	0	0	0	2	3
20	0	1	1	1	0	0	0	0	0	3	2
21	3	2	2	2	1	0	0	0	0	10	3
22	2	3	3	3	2	2	0	0	0	15	3
23	1	1	2	1	1	0	0	0	0	6	3
24	0	0	0	0	0	0	0	0	0	0	1
25	1	2	1	2	1	2	1	0	0	10	4
26	0	0	3	0	0	0	0	0	0	3	3
27	1	3	2	1	1	1	0	0	0	9	3
28	0	1	1	2	1	0	0	0	0	5	3
29	0	3	3	0	0	0	0	0	0	6	3
30	0	1	3	3	3	3	0	0	0	13	4
31	3	1	3	3	2	3	2	2	2	21	4
32	3	3	3	3	3	3	3	3	3	27	4
33	3	3	3	3	3	3	3	3	3	27	4
Total HFIAS score										324	

Key: Food Insecurity categories

Category 1: Food secure

Category 2: Mildly food Insecure

Category 3: Moderately food insecure

Category 4: Severely food insecure