HIV/AIDS and Agriculture Systems Initiatives[1] (HAASI)

Claude Nankam.
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1. Introduction

HIV/AIDS is now recognized as the greatest challenge to the development community today, rolling back decades of development progress. It is affecting family welfare, economic growth, and social services. Family incomes have been reduced, as HIV-infected adults are usually too sick to work to provide for themselves and their families. At their death, high burial costs add to the loss of income. The twin enemies of HIV/AIDS and poverty stand to grossly undermine efforts made towards sustainable development in sub-Saharan countries for many years to come.

At the PVO-USAID Steering Committee on Multisectoral Approaches to HIV/AIDS held 16-17 October 2002 in Washington DC, Mr. Stephen Lewis, Special Envoy of the UN Secretary General for HIV/AIDS made the following statement: "*Currently six countries in southern Africa are facing starvation induced by lack of rainfall and drought. While HIV/AIDS is not causing the famine, it certainly exacerbates it, especially since HIV/AIDS has ravaged the agricultural sector. It is impossible to talk about agriculture without addressing HIV/AIDS.*"

Agriculture stands out because it constitutes the backbone of the socio-economic life in rural Africa. But in reality, HIV/AIDS cuts across all sectors of livelihood and requires a multisectoral response. Realizing that the concern of any rural household in sub-Sahara Africa today is food security, the challenge remains, how HIV/AIDS programming can be mainstreamed into the agricultural sector.

Most organizations, on the ground, are very good in implementing HIV/AIDS or Food Security programs, but observations from different fora (Boon September 2001 IFPRI 2020 Vision conference; Rome December 2001 FAO HIV/AIDS & Food Security Conference; Washington DC October 2202 USAID-PVO Conference on Multisectoral Approaches to HIV/AIDS in Africa) indicate that everyone is struggling with what could be done for an integrated HIV/AIDS/Food Security program. One reason for this is that both HIV/AIDS and Food Security cut across all sectors of the socioeconomic life.

In order to systematically analyze the effects of HIV/AIDS on rural livelihoods and food security, and identify potential areas in which mitigation efforts can be directed, Stokes (2003) proposed the sustainable livelihood framework. This framework focuses on a set of capital assets that rural households use to seek their livelihoods and that are likely to be affected by the pandemic. These assets include human, natural, financial, social, and physical capital. In the HAASI study, focus was on the human and physical capitals and their effects on the natural, social, and financial capitals.

HIV/AIDS and Household Labor

Reports from UNAIDS[2] in 1999 indicated that in Zambia, Malawi, and Mozambique, 20, 16, and 13%, respectively, of adults 15-49 years old were living with HIV/AIDS. The death of these productive members of households, due to HIV/AIDS, increases household dependency ratios, reduces household productivity and caring capacity, and also impairs the inter-generational

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[2] www.unaids.org

transfer of local knowledge, practices, and skills (Haddad and Gillespie, 2001). Stokes (2003) lists, among the impacts of the lost of human capital due to the pandemic, the intra-household reallocation of labor, the decrease in area cultivated (increased fallow), the change in cropping patterns and/or animal production to less labor-intensive practices, and the decline in yields. A study by Takashi and Jayne[3] showed that the death of a prime-age male head of household leads to a 68% reduction in the net value of the household's crop production. Also such a death adversely affects income from cash crops (58% reduction) and non-farm income. The death of an adult female causes a greater decline in the cereal area cultivated.

One objective of HAASI was to examine the use of the scarce household labor for food production, and determine points where interventions could be targeted to increase food production.

HIV/AIDS and Nutrition

Studies have shown that HIV/AIDS impairs the immune system, and that a person infected with HIV/AIDS has an increased risk of becoming malnourished. Malnutrition in turn increases both the susceptibility to HIV infection and the vulnerability to its various impacts (Piwoz and Preble, 2000; Network of African People Living with HIV/AIDS, 1997).

An HIV-infected person needs 10-15% more energy, and 50-100% more protein than the daily requirement (James and Schofield, 1990). In rural Sub-Saharan Africa, adult male and female activity level are usually heavy, requiring at least 2,920 Kcal and 2,400 Kcal per day, respectively. When infected with HIV, the daily requirement is estimated to be 3,358 Kcal, and 114 g of protein for a male, and 2,768 Kcal and 96 g of protein for a female. How this translates into quantity and quality of food-consumed daily in a rural sub-Saharan household is important.

A total of 49 nutrients are essential for sustaining human life. Limited information is available as to the amount of these nutrients in the food produced and consumed by households in sub-Saharan Africa. Yet because this region of the world has the highest number of people living with HIV/AIDS, further studies are necessary.

The HAASI also had as an objective to determine the likelihood of a household's own level of production being able to meet the nutritional needs of its members for a productive life

2. Targeted Countries and Communities

Three countries, Zambia, Malawi, and Mozambique were selected for the study. The WVUS HIV/AIDS team recommended these countries from among those most highly hit by HIV/AIDS. The three chosen are also priority countries for World Vision's HOPE Initiative. In each country, two Area Development Programs (ADPs) were selected based on the incidence of HIV/AIDS and its impact on the livelihood of households in the communities. A team composed of the WVUS Agriculture Team Leader, The SARO Food Security Coordinator, the National Office Food Security Manager or his representative, the ADP Manager and his Agriculture and HIV/AIDS coordinators conducted a diagnostic survey in (Table 1):

- Two ADPs in Zambia (Chivuna and Kapululwe) May 12-16, 2003
- Two ADPs in Malawi (Nthondo and Kafulu) May 19-22, 2003
- One ADP in Mozambique (Nhamarraua) June 2-3, 2003

[3] Contact: jayne@pilot.msu.edu

The team was not able to visit the Nyaterre ADP in Mozambique due to conflicts in the schedule of the ADP Manager and his staff.

Table 1: HAASI Targeted ADPs and Number of Participants per Community

COUNTRY	ADP	COMMUNITY	# VILLAGES	TOTAL N	# MEN	# WOMEN
Zambia	**Chivuna**	Nkonkola	14	65	21	44
		Chivuna	9	60	23	37
	Kapululwe	Mwachilele	15	59	9	50
		Chilyabale	8	30	15	15
Malawi	**Nthondo**	Mtuwanjovu	6	59	9	50
	Kafulu	Mafunthe	6	69	37	32
		Mkwera	9	79	62	17
Mozambique	**Nhamarraua**	Chongolela	6	28	14	14
		Bisquete	NA*	27	18	9
			Total	**476**	**208**	**268**

*300 families form the community.

It is important to note that the timeframe of this study, one growing season after the severe southern African drought, helped assess the level of household resilience to external shocks.

In Malawi, the team had the opportunity to meet with the People Living with Aids Support Group in the Nthondo ADP. This is a group of HIV-positive individuals formed to support each other and share knowledge and information on the management of their health and the disease they carry. The support group focuses on treatment and nutrition, as well as advocating on behalf of PLWHA in the ADP.

The team also visited the Mtuwanjovu Community-Based Child Care Center (CBCC), one of 19 CBCCs in the Nthondo ADP. The CBCC provides a place where orphans, ages 2-5, can be cared for by community volunteers so that older siblings are able to attend a nearby primary school. The orphans are brought to the center by older siblings, volunteers, or are able to walk by themselves. This particular CBCC has 177 orphans from 89 families, many of whom are girls. During their time at the center the children are fed one meal and one snack. Community members, trained by Social Welfare with support from World Vision, belong to a group called Care Committee. Each member volunteers to take turns in caring for the orphans at the center.

3. Data Collection

Semi-structured group interviews and the Ten Seed Technique (TST) were used to gather information from the communities. These techniques are modified Participatory Learning and Action tools by which the community members can describe their social systems and survival strategies using their own criteria and characteristics. This helps the surveyor obtain a clear picture of what the community's survival strategy looks like, thus setting the stage for an analysis of capabilities and vulnerabilities (Myers, 1999).

The group interviews included Large Group (LG) discussions over more general issues of the community, and Focus Group (FG) discussions over specific issues with members of household type, and social groups.

The TST is useful in gathering qualitative information on various issues, especially regarding perception of people's view of themselves in relation to others.

After initial rapport building with the group and explanation that the purpose of the exercise is to understand and learn about their perspective, the group is given ten seeds and asked to consider the seeds as a representation of the entire population being studied. They are then asked to move the seeds around into groups representing the aspect being analyzed. Once the groups of seeds have been formed, the participants are asked to describe them and give details on reasons for classifying them the way they have done. Further details are then sought on indicators that

determined the segregation. Each group of seeds now has a very distinct identity accorded by the participants, and discussions can now proceed around the "visual" created. After finalization the information is transferred onto paper.[4]

Community Characteristics

Using the TST, participants were asked to divide the population by gender. The general distribution of the population was 60% female and 40% male, with the exception of Mtuwanjovu and Kwera in Malawi, and Bisquete in Mozambique where the population was divided into 70% female and 30% male. When disaggregated by age, Malawi and Mozambique seemed to have a younger population, with half of the people falling in the "less than 15 years old" age group (Table 2). The interviewees in Mozambique attributed this to war, while in Malawi it was attributed to HIV/AIDS.

Table 2: Distribution of Population by Age Groups

	COUNTRY	AGE GROUPS (%)		
Female (60%) Male (40%)		**< 15**	**15 - 45**	**> 45**
	Zambia	30	50	20
	Malawi	50	40	10
	Mozambique	50	30	20

Note: Population is young in Malawi because of HIV/AIDS and in Mozambique because of war.
Same distribution for male and female.

By further disaggregating the age group distribution by gender, in most cases, the numbers of female and male in the middle age groups were similar, except in Chilyabale in Zambia where there were more male than female (Table 3).

Table 3: Population Distribution by Age Group and Gender

COUNTRY	COMMUNITY	GENDER	<15(%)	15-45(%)	>45(%)
ZAMBIA	**Nkonkola** (n=65)	F	20	70	10
		M	30	50	20
	Chivuna (n=60)	F	30	50	20
		M	30	50	20
	Mwachilele (n=59)	F	30	50	20
		M	40	40	20
	Chilyabale (n=30)	F	50	30	20
		M	50	40	10
MALAWI	**Mtuwanjovu** (n=59)	F	50	40	10
		M	50	30	20
	Mafunthe (n=69)	F	50	40	10
		M	50	40	10
	Mkwera (n=79)	F	50	40	10
		M	50	40	10
MOZAMBIQUE	**Chongolela** (n=40)	F	50	30	20
		M	50	30	20
	Bisquete (n=30)	F	50	30	20
		M	50	30	20

[4] Source: Use of Ten Seed Technique by Dr. Ravi Jayakaran. April 2002 World Vision China

Household Characteristics

a. Household Types

When asked for the types of household that exist in the community, participants responded that there were four types:

- Households headed by elderly people, with grandchildren under their care, in most cases orphaned by HIV/AIDS (**GHH**);
- Households composed of orphans where the oldest is taking care of the younger siblings (**OHH**);
- Widow-headed households (**WHH**); and
- Households with the two parents (**MHH**)

Participants were then asked to distribute the ten seed into those household types. The average proportion of MHH ranged between 30-43.3% and that of WHH between 30-40%. Orphan-headed households ranged between 7.5-10% while GHH ranged between 16.7-25% (Table 4). Stokes (2003) stated that the loss of experienced agriculture workers has affected both individual households and communities, resulting in labor shortages and a decline in productivity both on and off-farm.

Participants were then asked to "show what the distribution was like 20 years ago". The distribution of seed per categories indicated that 20 years ago, in the Zambian communities, only 2.5% of households were headed by orphans, while in Mozambique and Malawi, all the orphans were taken care of by relatives (Table 4). In all three countries, more households had both parents (40-55%), and were therefore less vulnerable.

Table 4: Average Proportion of Household Types by Country, Present and 20 years Ago

COUNTRY	GHH	OHH	WHH	MHH
Zambia	25	7.5	32.5	37.5
20 years ago	17.5	2.5	25	55
Malawi	16.7	10	30	43.3
20 years ago	30	0	16.7	53.3
Mozambique	20	10	40	30
20 years ago	30	0	30	40

GHH= Grand parent headed household; OHH= Orphan headed household;
WHH= Widow headed household; MHH=Male and female headed household;

b. Size of the Household

Questions were also asked on the average size and composition of households. Responses from participants indicated that household size varied between 7-15 people: father, mother, children, and relatives. Polygamy was common, with, on average, 2 to 3 wives per husband. In general each household had between 3-5 orphans. The need for labor was a contributing factor in promoting polygamy and larger households.

c. Community social classes

After explaining to the participants the food and livelihood security concept, they were asked to determine the number of social classes that they perceived existed in their community. In Chivuna ADP, the response was based on the assessment of whether or not a household struggled to survive, and they distinguished two classes: rich and poor. In Kapululwe ADP, three classes were identified: the *Bawina* (rich), the *Baliko ceena* (average), and the *Bapenshi* (poor). In Malawi, respondents came up with four classes: *Nwana lirenji* (rich), *Opezako* (average), *Osauka* (poor), and *Osaukitsitsa* (very poor). All four of these classes existed in Nthondo ADP, but in Kafulu ADP, the upper class of rich people (*Nwana lirenji),* did not exist. In Mozambique, the accumulation of wealth was associated with the creativity and vision of an individual, and his

or her management skills. Three classes were identified: *Okana* (good management), *Zimola* (lack of vision) and *Pololа* (lazy), in Chongolela; and *Kuonerathu* (have vision and are proactive), *Nhacuona* (have vision but are not proactive) and Ncherengue (suffer a lot), in Bisquete (Table 5).

Table 5: Social Classes in Targeted Communities

COUNTRY	ADP	WEALTH CATEGORIES (%)			
Zambia	**Chivuna Area Development Program**				
	Nkonkola	Rich	Poor		
	Now	10	90		
	20 years ago	90	10		
	Chivuna	Rich	Poor		
	Now	30	70		
	20 years ago	60	40		
	Kapululwe Area Development Program				
	Mwachilele	Bawina (rich)	Baliko ceena (Middle class)	Bapenshi (poor)	
	Now	10	20	70	
	10 years Ago	70	20	10	
	Chilyabale	Bawina (rich)	Baliko ceena (Middle class)	Bapenshi (poor)	
	Now	10	30	60	
	20 years ago	50	20	30	
Malawi	**Nthondo Area Development Program**				
	Mtuwanjovu	Nwana lirenji (rich)	Opezako (Middle class)	Osauka (Poor)	Osaukitsitsa (Very poor)
	Now	10	20	30	40
	20 years ago	0	30	60	10
	Kafulu Area Development Program				
	Mafunthe		Opezako (Middle class)	Osauka (Poor)	Osaukitsitsa (Very poor)
	Now		10	20	70
	20 years ago		40	40	20
	Mkwera		Opezako (Middle class)	Osauka (Poor)	Osaukitsitsa (Very poor)
	Now		10	30	60
	20 years ago		60	30	10
Mozambique	**Nhamarraua Area Development Program**				
	Chongolela		Okana (Good management)	Zimola (lack of vision)	Polola (lazy)
	Now		20	30	50
	Bisquete*		Kuonerathu (have vision and are proactive)	Nhacuona (have vision but are not proactive)	Ncherengue (suffer a lot)
	Now		20	30	50
	20 yrs ago		10	30	60

* The conditions have improved in Bisquete because now people are benefiting more from social services and access to health.

Around 70-90% of households in these communities were considered poor and/or very poor. The moderator asked what the situation was like for these households 10 to 20 years ago, and the respondents indicated the following:

- Government policies for agriculture production and marketing were better (farm inputs such as fertilizers were subsidized, and cooperatives/marketing boards were functional);
- The Agricultural Extension Service was effective and efficient;
- Loans were available at affordable rates;
- There was less population pressure on the land;
- Rainfall patterns were better;
- There was less human disease (HIV/AIDS); and
- The corridor disease on cattle was not prevalent, and cattle dipping was free.

Considering all of these factors, 10 to 20 years ago, only about 10-30% of households were considered poor.

d. Characteristics of Social Classes

Table 6: Community Criteria for the Social Classes

RICH *(Bawina, Nwana lirenji, Okana, Kuonerathu)*	AVERAGE *(Baliko ceena, Opezako, Zimola, Nhacuona)*	POOR *(Osauka)*	VERY POOR *(Bapenshi, Osaukitsitsa, Polola, Ncherengue)*
Own land and cultivate 10 acres or more	Own land and cultivate 6-10 acres	Own land but cultivate only about 4 acres	Cultivate less than ¼ ha of land
Have food reserves for the whole year and surpluses	Food reserves for 6-9 months	Food reserves for 3 months	Harvest depleted within 1 month
Eat at least 3 meals/day	Eat 2 meals/day	Eat 1 meal per day	Grow crops but much is eaten before full maturity
Good home (bricks and roofed with iron sheets or roof is grass thatched sometimes with plastic under the grass)	House with bricks, but mostly grass thatched	Mud house thatched with grass	House is a hut made of branches and grass
Own animals (7-8 cattle, >20 goats, pigs and chickens)	Own animals (5-7 chickens, 2 goats, 2 pigs)	Own 3-4 chickens	No livestock
Employ casual labor from the poor and very poor	Employ casual labor from the poor and the very poor		Spend more time working in the farms of the rich
Acquire fertilizer early	Acquire few bags of fertilizer	No access to fertilizers	Rent out their land to the rich
Have pair of oxen and farm implements	Have pair of oxen and oxcart		
Plough and plant early	Opezako rents land from the Osauka	Rent their land to Opezako	Poor management of their farms
House goods such as radio	Own bicycle		
Send children to school	Send children to school		

The **rich** in Chivuna ADP had the same characteristics as the *Bawina* in Kapululwe ADP in Zambia, and the *Nwana lirenji* in Nthondo ADP in Malawi, or the *Okana* and *Kuonerathu* in Mozambique. The *Okana* were described as people with good management skills, and the *Kuonerathu* as those who had vision and were proactive. This category of people own farm implements, and can access farm input to produce enough food for the year, even with surpluses. They have a lot of assets and hire labor from the poor and very poor categories (Table 6).

The *Baliko ceena* in Kapululwe ADP in Zambia, *Opezako* in Malawi, and *Zimola* and *Nhacuona* in Mozambique had similar characteristics and were classified as **average** category. Some of the **rich** in Chivuna, Zambia fell under this category. This group of people is food insecure for approximately 3-6 months out of the year, rent land from the poor, and hire labor from the poor and very poor categories.

Although some of the **poor** in Zambia could be considered very poor, a lot of the characteristics of this category were specific to that given for the *Osauka* in Malawi. The **very poor** grouped the *Bapenshi* in Kapululwe, Zambia, the *Osaukitsitsa* in Malawi and the *Polola* or *Ncherengue* in Mozambique. The poor are food insecure for approximately three months out of a year, while the

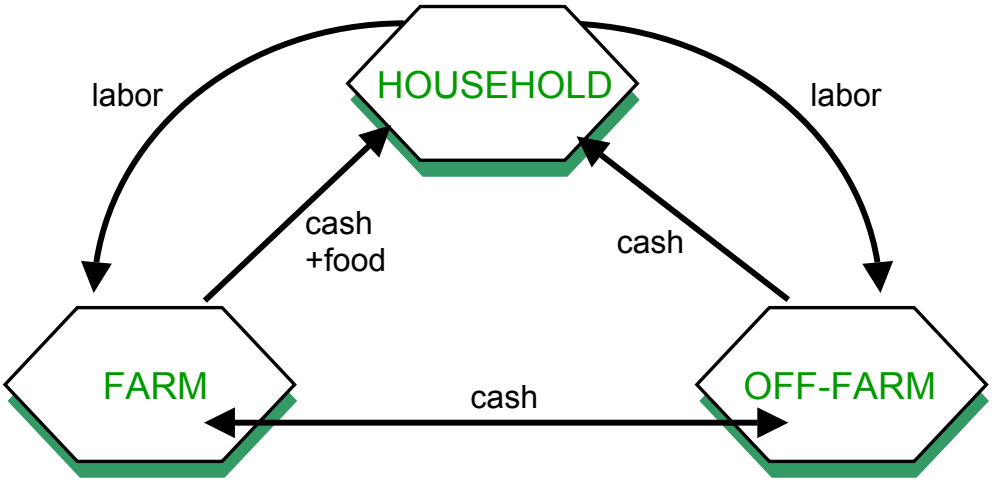
very poor, when they are able to harvest a crop, have only enough food to carry them through one month after harvest.

Farming Systems

Agriculture is the main economic activity in the targeted ADPs. It is subsistence agriculture, and its dynamics need be understood clearly to determine possible points where interventions could enhance the resilience of the poor household. To do this, Du Guerny (2002a) proposes two levels of focus: i) the farm system and ii) the farm-household system.

Farm systems are identified through variables such as location, climate, crop/livestock, and labor. The last two variables, crop/livestock and labor, will be used in this study. An FAO study (Barnett, T. and M. Haslwimmer, 1995) described the farm-household system level as composed of the farm, the household and the off-farm source of income (Figure 1). Household members supply the necessary labor for farm operations but also migrate to the cities, mines, and plantations for income, resulting in remittances, and needed cash for farm inputs and hired labor.

Figure 1. A Farm-Household System



Adapted from: *Agriculture and HIV/AIDS, J. du Guerny. 2002a.*

To understand the labor requirement, respondents were asked to list, by gender, all the different crops grown by a household during a cropping season (Table 7). After the list was made, they were then asked to indicate those crops that were grown for cash.

In all the communities except those in Mozambique, where both male and female worked on the same plots, men were mostly involved in the production of one or more of the following cash crops: tobacco, cotton, sunflower, and soybeans, but also maize, cassava, sweet potatoes, and paprika for commercial purposes (Table 7). Women grew up to 10 different food crops, with the option to sell some of the harvest, such as groundnuts, cowpeas, and sweet potatoes.

For questions on the cropping systems, respondents indicated that in Zambia and Malawi, maize was grown in association with sorghum, Bambara groundnut and cowpea, and also, in some communities, with beans and cassava. Tobacco, cotton, groundnuts, sunflower, and sweet potatoes were grown primarily as sole crops. In Mozambique, maize was grown in association with sorghum and pigeon pea. Cassava was associated with pigeon pea and Bambara groundnut. Cotton and groundnuts were grown in pure stands. So there were basically four farming systems in each community (Table 7).

Table 7. Main Crops Grown by Gender and Farming Systems

COUNTRY	COMMUNITY	MEN	WOMEN	FARMING SYSTEMS
Zambia	**Nkonkola**	Maize, cotton, sunflower	Maize, groundnuts, cowpeas, sorghum, sweet potatoes	-Cotton -Maize -Groundnuts -Sunflower
	Vegetables: Rape, cabbage, tomato, okra, onion, amaranth, Indigenous vegetables Chaumoria Cleomeria, black jack, mubula, and matobo (African chewing gum)			
	Chivuna	Maize, cotton, sunflower, cowpea, sorghum	Maize, groundnuts, cowpeas, sorghum, sweet potatoes, Bambara groundnuts	
	Vegetables: Rape, cabbage, tomato, okra, onion, amaranth, Indigenous vegetables Chaumoria Cleomeria, black jack, mubula, and matobo (African chewing gum)			
	Mwachilele	Maize, cotton,	Maize, groundnuts, sweet potatoes, sunflower, beans, cowpeas, cassava, Bambara groundnuts,	-Maize -Cotton -Groundnuts -Sweet potatoes
	Chilyabale	Maize, cotton, soybeans, sunflower, beans	Maize, groundnuts, sweet potatoes, cowpeas, sunflower, beans, cassava, Bambara groundnuts, soybeans	-Maize -Cotton -Groundnuts -Sweet potatoes
Malawi	**Mtuwanjovu**	Maize, tobacco, sweet potatoes, cassava, sugar cane, banana, paprika, soybeans	Maize, groundnuts, sweet potatoes, cassava, soybeans, beans, cowpeas, Bambara groundnuts, potatoes, pumpkin	-Maize -Tobacco -Groundnuts -Sweet potatoes -Cassava
	Mafunthe	Tobacco, maize, groundnuts, cassava, sweet potatoes, sugar cane, vegetable garden (cabbage, rape, tomato)	Maize, groundnuts, beans, soybeans, Bambara groundnuts, cowpeas, potatoes, sweet potatoes, vegetable garden (cabbage, rape, tomato, onion)	-Maize -Tobacco -Groundnuts -Beans
	Mkwera	Tobacco, maize, groundnuts, cassava, potatoes, rice, beans	Maize, groundnuts, beans, soybeans, Bambara groundnuts, cowpeas, potatoes, sweet potatoes, vegetable garden (mustard, tomato, onion)	-Maize -Tobacco -Groundnuts -Beans
Mozambique	**Chongolela and Bisquete** Men and women grow same crops	Maize, groundnuts, cassava, pigeon pea, sugar cane, sorghum, cowpea, rice, sugar cane, pumpkin, sweet potatoes, banana, sesame, sunflower, Bambara groundnuts, vegetables (tomato, kale, onion)		-Maize -Cotton -Groundnuts -Cassava

Names in bold are crops grown for cash. Because maize is the staple food, it is grown for both cash and food.

Labor Distribution

Respondents were then asked to use the ten seed method to show their total labor and its distribution among the farming systems. The other crops also grown during the season were grouped in one category called "rest." Since the types of focus crops differ for male and female (with the exception of Mozambique), labor allocation was done separately for men and women.

Women used roughly 40-50% of their labor on the maize farming system in Zambia and Malawi, with extreme cases like in Chivuna where they said 70% of their labor was used on the maize system. The groundnut farming system came in second position with 20-30% of the labor. In the two communities of Mozambique, the maize farming system was the priority, also using 40-50% of labor, but followed by the cassava farming system that used 20-30%. Most of the men's effort (30-50% of labor) went into maize production, and 30-40% into cotton or tobacco production (Table 8).

Table 8. Labor Distribution (% time)

COMMUNITY	MAIZE	COTTON	TOBACCO	G'NUTS	BEANS, COWPEA, OR SOYBEAN	SWEET POTATOES	CASSAVA	REST
Nkonkola	70	-	-	-	-	-	-	30
Chivuna								
Men	60	30	-	-	-	-	-	10
Women	70	-	-	20	-	-	-	10
Mwachilele								
Men	50	30	-	-	-	-	-	20
Women	40	-	-	30	20	-	-	10
Chilyabale					20			
Men	30	40	-	-	-	-	-	10
Women	40	-	-	30		20	-	10
Mtuwanjovu								
Men	40	-	30	-	-	10	10	10
Women	50	-	-	20	-	10	10	10
Mafunthe								
Men	30	-	40	20	-	-	-	10
Women	40	-	-	30	20	-	-	10
Mkwera								
Men	30	-	40	20	-	-	-	10
Women	40	-	-	30	20	-	-	10
Chongolela	50	-	-	20	-	-	30	-
Bisquete	40	30	-	10	-	-	20	-

In terms of tasks on the farm, in the GHH and WHH, women perform land preparation and harvesting, whereas both women and orphans perform planting and weeding. These types of households do not hire labor. School children work on the farm in the morning or afternoon depending on when they have classes. But during weeding time, children frequently miss school to work on the farm. In the MHH, everyone does field clearing and planting, whereas tool cleaning and preparation is the responsibility of the men and the boys, and the men are solely responsible for seed procurement. Everyone does plowing if the household does not have work-oxen, but the men and the boys handle the plowing if the household does own oxen.

Looking at social capitals such as development groups and farmers associations, in Mozambique, about 90% of households belong to the community association organized and/or strengthen by World Vision. In Chongolela, members could hire labor from the association. In Bisquete, the association has developed a credit scheme accessible by its members, and a fund for members in distress (e.g. in case of funerals of a love one). This type of social setup did not exist in Zambia and Malawi. However, in Malawi, church groups, women groups, and irrigation groups existed in some ADPs, and in addition, World Vision was promoting farmers groups. Tobacco farmers were members of the Tobacco Association of Malawi. In these two countries, the

organizations were not setup to provide hired labor or credit to members, except for the cotton or tobacco farmers who could receive seed and/or fertilizer loans from their respective cooperatives.

Household Nutrition

"With better diets, poor farmers with AIDS could extend their lives long enough to pass on crucial skills to their children" (FAO, 2002). To have an idea on what members of a household were eating, the moderator asked the participants to give the composition of the meals they had eaten for the past seven days. Respondents, in general, had two meals a day, mostly lunch and dinner. Coming out of the lean season (this was harvesting time), breakfast was occasional, and was mostly composed of maize porridge or boiled sweet potato tubers. Breakfast was more frequent in Mozambique and was made from the previous day's dinner, or composed of boiled cassava or sweet potatoes. In all the communities visited, there was very little to no variation in the composition of lunch and dinner.

In Zambia

Breakfast: Maize porridge with salt or left over nshima, or sweet potatoes

Lunch: Nshima eaten with rape (cooked ground groundnut), okra leaves (*derere*), pumpkin leaves, cowpeas or beans
Cowpeas with ground groundnut and *chodyobo* (mixture of pumpkin and maize grain)

Dinner: Nshima with pumpkin leaves (few times in ground groundnut), *derere*, or a vegetable.
Cooking oil was seldom used. When questioned why, respondents replied that their main source of oil was groundnut, a commercial crop with a good market price. Therefore, groundnut was mostly sold to meet other household needs.
Vegetables included rape, cabbage, tomato, okra (*derere*), onion, amaranth, and various types of indigenous ones such as *cleomeria*, black jack (*Bidens pilosa*), *mubula,* and *matobo* (African chewing gum).

In Malawi

Breakfast: Maize porridge, boiled sweet potato tubers, or pumpkin

Lunch: Nshima with pumpkin, sweet potatoes, cassava leaves, *derere* or ground groundnut, occasionally with *kapenta* (small dried fish) or beans
Pumpkin or sweet potatoes

Dinner: Nshima with *derere*, or pumpkin, sweet potatoes, and cassava leaves with ground groundnuts, with beans and kapenta or with salted boiled groundnuts. Some GHH and OHH reported that at times they dig banana rhizomes, dry them and grind them into flour to eat.

The diet of members of the Nthondo's People Living with AIDS Support Group was similar to the rest. They had a week training in nutritional education but are unable to apply what they learned because of lack of resources. They do grow a variety of vegetables to balance their diet, such as cabbage, rape, and kale, as well as fruits, such as oranges and tangerines.

In Mozambique

Breakfast: Maize, rice, or sorghum porridge with sugar or boiled cassava, leftover maize, or sorghum nshima or kale with pigeon pea

Lunch: Maize, sorghum nshima with pumpkin leaves or kale with ground groundnuts and tomato, or with beans, cowpeas, or pigeon pea cooked with coconut and dried fish, or rice with tomato stew

Dinner: Maize, sorghum nshima with pumpkin leaves or kale with ground groundnuts and tomato, or with beans, cowpeas, or pigeon pea cooked with coconut and dried fish. Occasionally banana or pineapple

The frequency of the use of each food item in the household diet is summarized in Table 9 below. The food types consumed in the targeted communities included:

Carbohydrates: Maize, sorghum, rice, sweet potato, pumpkin and cassava (maize constituting the main starch source).

Proteins: Cowpeas, beans, groundnuts, pigeon peas, and Bambara groundnuts (all of these eaten sporadically). Meat and fish are rarely eaten.

Vitamins and minerals: Orange flesh sweet potato and pumpkins are the main source of Vitamin A. Amaranths and other indigenous vegetables, mostly the dark-green leaves such as "black jack" and "derere" may provide other vitamins and micronutrients such as iron.

Fats/oils: Oil seeds such as groundnuts and Bambara groundnuts are the main source of oil, although eaten in minute quantities. Coconut and vegetable oil are used sporadically in Mozambique.

Table 9. Frequency Use of Food Items in the Household Diet

FOOD TYPES	FOOD ITEM	ZAMBIA (N=33)*	MALAWI (N=45)	MOZAMBIQUE (N=81)
Carbohydrates	Maize	70	89	65
	Rice	-	-	29
	Sorghum	-	-	11
	Sweet potato	15	6	3
	Cassava	0	0	14
	Pumpkin	9	2	4
Proteins	Meat (beef, pork, goat)	0	2	7
	Chicken	0	4	9
	Fish	9	2	16
	Beans	12	4	0
	Cowpeas	0	0	10
	Pigeon peas	3	0	10
Fats/oil	Groundnuts	3	33	21
	Coconut	-	-	14
	Oil	0	0	9
Vitamins and minerals	Orange flesh sweet potato and pumpkins for Vitamin A	N/A	N/A	N/A
	Amaranth,	-	-	-
	Pumpkin leaves	27	24	11
	Sweet Potato leaves	0	13	0
	Cassava leaves	0	4	0
	Cowpea/bean leaves	0	4	0
	Black jack	0	2	0
	Derere (leafy okra)	18	8	0
	Other indigenous vegetables	-	-	-

* n is the total number of meals described by respondents from a week recall.

4. Discussions and Recommendations

In six of the nine interviewed communities, 50% of the male and female population is less than 15 years old, and the majority of them are AIDS orphans. These are children of family members who were employed in off-farm jobs in urban areas, children of the community-productive age group in its twenties, thirties and forties killed by the disease. These children are either being cared for by grandparents (GHH), live on their own (OHH), or are cared for by other relatives. A World Vision census carried out in 2001-2002 indicated that GHH and OHH made up 13-15% of the population. That number is now perceived by the communities to be between 27-33%. When adding the one-parent orphans to the equation (WHH), the three vulnerable types of households make up 60-70% of the population, increasing vulnerability by 10-17% as compared to 10-20 years ago.

The vulnerable households are characterized by poverty and shortage of labor, which force them to cultivate only a limited area of land (1/4ha – 4 acres). Even if they do have more land, they tend to skip some of the important farm tasks such as weeding (mostly the GHH and OHH). Most of them are poor because they have sold the majority of their assets, including farm implements, to care for the sick ones. In addition, they have lost the remittances they used to receive from their extended family and they no longer have access to credit. Incentive loans for agricultural inputs are available only for tobacco and/or cotton farmers.

The challenge is to increase the productivity and production of the vulnerable households. To do this, the following can be recommended:

- Increase the knowledge base of OHH, by adapting agricultural extension messages for use by orphans, widows and the elderly. In an FAO study in Kenya, only 7% of households headed by orphans indicated that they had enough agricultural knowledge to carry on farming (FAO, 2001).
- Promote social capitals such as farmers associations in Malawi and Zambia and invest in community-owned assets (e.g. plows, draught animals) managed by the associations, to primarily benefit the GHH, OHH and WHH.
- Promote agroforestry technologies to replenish soil fertility, with a special focus on the species that can be seeded directly like *Tephrosia* and multipurpose like pigeon pea (*Cajanus cajan*), which can be used as food or sold for cash. This will also prevent marginal farmers from becoming indebted as they seek loans to purchase inorganic fertilizers, resulting in chronic food insecurity.
- Encourage the cultivation of crops that have a lower labor requirement or that have critical husbandry activities when labor use for other activities is not at a peak. Examples of these include fruit trees, cassava, and sweet potato.
- Disseminate stress tolerant, highly nutritious crop varieties such as orange flesh sweet potato (OFSP) high in β carotenes (IITA and CIP have been promoting OFSP in southern Africa through SARNET) and/or quality protein maize (QPM) (CIMMYT has released Obatamba, a QPM variety, adapted to various agro-ecologies of southern and east Africa). Also CIMMYT has developed a series of maize varieties tolerant to **stem borers, low nitrogen, drought, maize streak virus** and **Striga**, the five major stresses to maize production in sub-Saharan Africa.

Traditionally the African society is characterized by very strong social ties, trust, relationships within communities, a sense of collective responsibility, and a common outlook (Stokes, 2003). It is on this basis that infrastructures such as community-based child care centers, or community organizations were developed. Unfortunately, poverty and food insecurity resulting from the loss of labor, income and increased expenditures for medical care, coupling with drought and unfavorable government policies have eroded these social fabrics. Around 70-90% of households are considered either poor or very poor, with approximately 1-3 months total food supply for an entire year. The struggle for survival is making it impossible for a household to provide support to a needy neighbor or to a community institution like the community-based child care centers (CBCC). For example, in Nthondo where childcare centers initially mobilized food

through donation from community members, the community capacities to mobilize food through door-to-door contributions were weakened by the severe hunger experienced during the past two growing seasons. Also volunteers at the CBCC indicated that they needed incentives (allowances) to enable them to hire temporary labor to work their own farms, which the community was unable to fulfill as compensation for their time at the centers.

- It is a fact that household dependency ratio in these communities has increased tremendously, and people are overwhelmed by the requests for help from relatives and neighbors. Therefore creating a community farm to grow food for the orphans at the CBCC is crucial for its sustainability. But this needs proper technical backstopping; in order to advise what crops to grow that will supplement donations from the community and provide a balanced diet to the children.
- The poor and very poor not only rent their land to the rich, but also work that same land for the rich, in exchange for food. For these categories of people, it is important to combine food aid with long-term food security measures, such as those suggested in the recommendations above. Food aid will maintain consumption and set the foundation on which to initiate build-up of food reserve from one's own production. A medium- to long-term use of food for vocational and agricultural skills training is highly recommended for OHH, GHH and WHH.
- Animals are the assets that determine wealth in the community. Small animals such as goats, chickens, duck, and rabbits have been used in different World Vision programs throughout Africa, with varying degrees of success. If the appropriate types of livestock are used, interventions can lead to a successful restocking exercise of the household small animals and therefore restore some degree of solvency to the household.

Men and women grow a series of crops for their livelihood. While the main drive for men is cash, women focus more on food crops and can easily plant up to 10 different crops in a given growing season spreading the available labor too thin. Four farming systems are identified in the communities visited; maize, tobacco or cotton, groundnuts, and/or cassava as the main crops. Maize is commonly intercropped with pigeon pea, beans and/or sorghum, whereas groundnut, and cotton or tobacco, are mostly grown in pure stands.

For both men and women, about 50% of the labor is allocated to the maize farming system, with maize being both the staple food and cash crop. In addition, more than ¾ of the remaining labor is devoted to the production of groundnut for women or to the production of tobacco/cotton for men.

In Zambia, acreages of cotton and sunflower have increased in response to improvement in market for those products. In Malawi, incentives in the form of farm input loans (fertilizers, seed) have led to the allocation of more land for tobacco cultivation. This has caused a negative effect on household food security in that, with a poor crop due to the drought, the farmer could not pay back his loan and ended up with basically no cash to buy food.

In Mozambique, cassava is planted in September, at least a month before maize planting, while in Zambia and Malawi, it is either planted at the same time with maize (Malawi) or at the first maize weeding (Zambia). This is probably one of the reasons why it remains very minimal in the two countries compared to Mozambique where it is the second main food crop. A study indicated that cassava is labor intensive, with very low return to labor, but because the operations of cultivating, planting, and harvesting usually occur in the slack months when labor is abundant, and because cassava is highly tolerant to drought, farmers grow it for food security rather than attractive return to labor (Hilton, 2001).

- The high number of crops found on women's farms and the increased use of indigenous vegetables in countries like Malawi, are an attempt to reduce risks to food insecurity. FAO states that biodiversity and indigenous knowledge represent local resources with enormous potential in the fight against food insecurity and the devastating impact of HIV/AIDS. One of the reasons for this, is that many traditional crops are very resilient and

adaptive to the local environment, and require fewer inputs such as fertilizers. Effort must be made in the gathering and dissemination of information related to the husbandry and use of traditional crops.

- Additional study is needed to be able to recommend intercropping systems and crop arrangements that will optimize biodiversity on the cultivated land without increasing competition between crop species, and lead to optimum production with less labor.
- Intensify the use of indigenous fruit trees, as recommended by ICRAF.

Household diets in Mozambique appear to be more diversified than in Zambia and Malawi. Maize is the main starch staple in all the communities interviewed, followed by rice and cassava for Mozambique. It provides much of the energy needed by household members. A small proportion of starch is obtained from groundnut, which is also the major source for oil (Table 9).

Initially, this study was intended to estimate the daily intake of the different food types and convert these findings into the required daily amount (RDA) of each of the main nutrients (energy, proteins, and vitamins and minerals). On the ground, it was apparent that with the resources and tools available, we could only conduct a qualitative survey on the food types frequently consumed by the household. In order to determine gaps that must be filled for each member of the household to live a healthy and productive life, a more in-depth study will be necessary to identify and quantify nutrient intake.

In the meantime, the following can be recommended:

- From the discussion with those infected with HIV/AIDS, it is clear that despite their willingness to put into practice what they have learned in nutrition education classes, they lack the resources and the strength to grow or acquire all the different food items needed to stay healthy. The African potato (*Hypoxis rooperi*) (Figures 2 & 3), discovered in South Africa, has been shown to boost the immune system, and is now being recommended for HIV-positive patients.
- It is known that vitamins and minerals, and more specifically Vitamin A, Vitamin C, Vitamin E, certain B-group Vitamins, and minerals such as Selenium, Zinc and Iron, protect against opportunistic infection. While continuing to promote the food types that contain these nutrients, it is recommended that each family have a few plants of the "Miracle Tree" (*Moringa oleifera)* in their homestead. *Moringa* is very rich in vitamins and minerals and is been used intensively in West Africa to treat malnutrition in children and nursing mothers, as well as anemia in pregnant women.
- Increase the production of groundnut and its use in the diet.
- Promote the growth of sunflower oil presses for the production of sunflower cooking oil.
- Promote the use of cassava leaves as a vegetable in the diet.

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Figure 2. The African Potato (*Hypoxis rooperi*) plant

Figure 3. African Potato – the rhizome is sliced, sun-dried, ground and added to the meal.

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