

ANALYTICAL METHODOLOGY

The Swaziland VAC will present findings from the vulnerability assessment of rural households in two manners. In the first plane analyses focus on key sectors for development in an isolated approach. The second level try to follow the new school of thought that looks at vulnerability in a holistic and integrated manner, acknowledging that there is need to converge sectorial information. Although attempt is made in this assessment to join sectors on vulnerability, it is necessary to acknowledge that no single method for integrated vulnerability assessments has been agreed among professionals and institutions working in this area. The methods here presented accept the view that vulnerability have many facets and that food security is impacted and impacts various livelihood aspects. The assessment also views risk¹ assessment as a key analytical step to understand types of interventions.

The statistical method used to assess sectorial information per administrative region (Hhoho, Manzini, Shiselweni and Lubombo) was mainly based on one-way analysis of variance and Post-Hoc Turkey Test. These tests allow the reader to identify differences between areas that are likely to be statistically valid (the 'p' value of significance has to be < 0.05). In some cases, composite indicators – such as the coping strategy index and the dietary diversity index – were developed. Specificities about the methodologies for each sector are included before the presentation of their findings.

The statistical method used to congregate vulnerability sectors was based on the Two-Step Cluster analysis. The Two-Step Cluster Analysis procedure is an exploratory tool designed to reveal natural groupings (or clusters) within a data set that would otherwise not be apparent. The algorithm employed by this procedure allows for inclusion of both continuous and categorical variables and allow for automatic choice of optimal number of clusters (SPSS help guide).

Box xxx: Organization of
Vulnerability Analyses
Sector
▪ Production
▪ HIV/AIDS
▪ Access to Credit
▪ Access to Education
▪ Water and Sanitation
▪ Access to Employment/Income
▪ Shocks and Coping Strategies
▪ Dietary Intake
▪ Nutritional Outcomes
Integrated
▪ Access to Food
▪ Humanitarian Clusters

¹ Risk is perceived as the function of shocks and the incapacity of households to respond to it without damaging their livelihoods

In order to differentiate between chronic and transitory food insecurity, the Swaziland VAC built two models of integrated sectors analyses. The first model focused on indicators directly related to access to food, these being mainly purchasing power, production levels, and dietary outcome variables, such as dietary diversity and number of meals. The occurrence of shocks and asset ownership were used to further classify this model (see discussion in results section). The second model focused on broader vulnerability assessment, and included all sectors reviewed individually. Table xxx and xxx illustrate indicators used in the two models.

Table xxx: Indicators used to arrive at Access to Food Clusters

Domain	Indicator	Type
Food Production	Number of Crops Planted	Yes/No
Income	Planted Cash Crops	Yes/No
	Total cash expenditure	Continuous
	Total food cash expenditure	Continuous
Food Security outcome	Total Weighted Dietary Intake	Continuous
	Number of meals for adults	Continuous
Control for Food Aid	Main source of maize was food aid	Yes/No

Table xxx: Indicators used to arrive at Chronic Food Insecurity Clusters

Indicator	Type	Variables
Crude Mortality Rate	Simple	# deaths per HH / members in HH *10,000
Acute Malnutrition	Simple	# of U5 wasted / number of U5
Chronic Malnutrition	Simple	# of U5 stunted / number of U5
Food Access	Composite (see section 2)	Planted Cash Crops Number of Crops Planted Weighted Dietary Intake Number of meals for adults Main source of maize was food aid Total cash expenditure Total food cash expenditure
Dietary Diversity	Simple	Weighted frequency of food groups (freq. min 0; max 7)
Water Access/Availability	Composite (see appendix I)	Source of water (improved or not) Minutes to get water – rainy season Minutes to get water – dry season
Shocks	Simple	Occurrence of shocks: weather, illness/death, income, pests
Livelihood Assets	Composite	Livestock, household assets, toilet type, lighting type, cooking fuel, housing characteristics, education
Coping Index	Simple (see appendix I)	Coping Index (diet=1, extreme diet = 2, migration =2, credit = 3, assets =3, expenditure =3, income = 1)

Each model resulted in automatically generated clusters, whose distributions are displayed in tables below. One-Way Analysis of Variance following post-hoc turkey test allowed the VAC team to identify differences between clusters. Table xxx and graph xxx to xxx illustrates key differences between clusters. Box xxx and box xxx illustrates VAC review of key differences between clusters.

Access to Food Clusters	Sample Size (N)	% of Sample
1	192	21.0
2	237	26.1
3	320	35.1
4	166	17.9
-	915	100

Chronic Vulnerability Clusters	Sample Size (N)	% of Sample
1	159	18.3
2	103	11.8
3	92	10.6
4	123	14.1
5	152	17.5
6	242	27.8
Total	871	100.0

- **Access to Food Model**

Table xxx: One way analysis of variance for indicators used for Model of Access to Food

Food Access Cluster	Total Number of Crops Planted	% HHs Planted Cash Crops	Food Expenditure in cash per Adult equivalent Member per 6 months	Non Food Expenditure per Member per 6 months	Mean Weighted Dietary Diversity	% HHs with very Inadequate Diet (Weighted Dietary Diversity <12)	% of HHs where Adult eat at least 2 meals	% HHs with Main or second main source of maize being Food Aid
1	1.5	0.0	147.0	198.5	13.9	24.5	100.0	6.6
2	1.4	8.2	343.7	521.8	25.8	3.3	76.2	70.5
3	1.4	0.0	315.8	468.9	33.8	0.0	100.0	0.0
4	2.0	1.8	245.5	516.5	34.4	0.0	100.0	0.0
Total	1.5	2.5	275.1	434.3	27.6	6.0	93.8	19.8

Diff. Cls. 4 to all	Sig from Cls. 2 to all (p<0.1)	Diff. Sig from Cls. 1 to all, 2 to 4	Diff. Sig from Cls. 1 to all (p<0.1)	Diff. Sig from Cls. 1 to all clusters	Diff. Sig from All Cls. to all	Diff sig from Cls 1 to all	Diff sig from Cls 1 to all	Diff. Sig from Cls. 2 to all (p<0.1)
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Box xxx: Labeling and brief description of the 4 clusters automatically generated by the two-stage cluster analysis for **Access to Food Model**

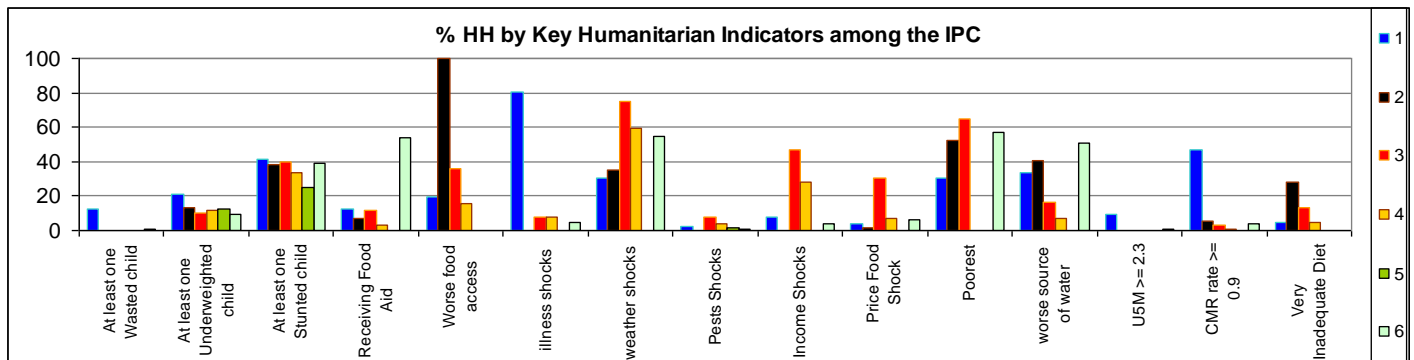
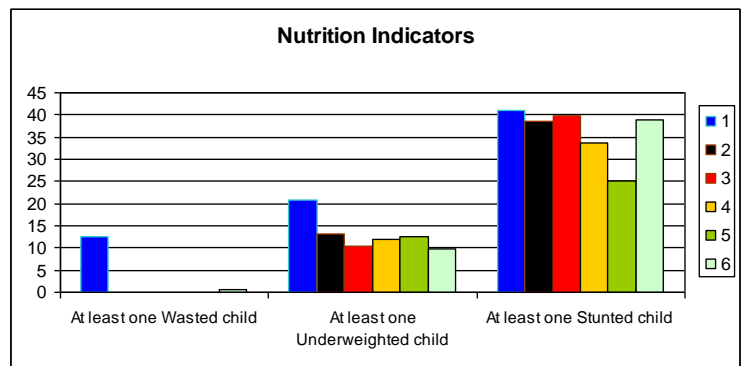
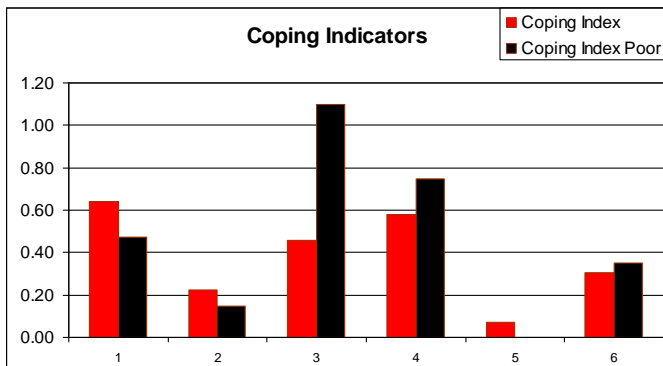
Cluster 1 - *Worse food access*: least expenditure on food and non-food, greatest ratio of food expenditure over total, lowest dietary diversity, almost no food aid, among highest level of poorest, highest level of children with diarrhea, lowest occurrence of loans.

Cluster 2 - *Receivers of Food Aid*: 93% of all households getting food aid are within this group, accounting for 70% of cluster's population. As this group is currently receiving food aid, the real food security access status can not be know because food access and utilization indicators are thought to be impacted by food aid.

Cluster 3 - *Moderate to Good Access to Food*: higher expenditure, higher dietary diversity, low existence of poorest households

Cluster 4- *Best Access to Food*: largest number of crops being produced, lowest ratio of food expenditure over total, largest dietary diversity.

- **Chronic Food Insecurity Model**



Box xxx: Labeling and brief description of the 4 clusters automatically generated by the two-stage cluster analysis for **Chronic Vulnerability Model**

Cluster 1: HIV/AIDS Humanitarian Crisis: High CMR, 80% with illness shocks, High Wasting

Cluster 2: Chronic Food Insecure: 100% with Worse Food Access, Highest Inadequate Diet (>25%), Among lowest Weather Shocks (<40% of HHs), No other shocks, Among highest poorest (>50%), worse access to water (>40%), among lowest coping strategies

Cluster 3: Acute Food Insecure: Second worse access to food (~40%), Highest Weather (~80%), income shocks (>40%), price of food (~30%)

Cluster 4: Generally Food Secure but Coping with Shocks: Low Worse Food Access (<20%), low inadequate diet (<5%), low poorest (~0%), but suffering weather shocks (~60%), income shocks (~30%)

Cluster 5: Generally Food Secure: Not among any “worse off” indicators (~0% for all)

Cluster 6: Receivers of Food Aid: Highest receivers of Food Aid (~60%), Highest poorest (~60%), worse access to

ANALYTICAL RESULTS

This section presents results for sectorial and integrated levels. Each section begins by explaining indicators and classification used whenever relevant. Afterwards key analytical results are presented and programmatic recommendations are discussed.

Sectorial Analyses

This section discusses indicators, results and programmatic recommendations for nine sectors: Production, HIV/AIDS, Access to Credit, Access to Education, Water and Sanitation, Access to Employment/Income, Shocks and Coping Strategies, Dietary Intake, Nutritional Outcomes.

I. The Underlying Threat: HIV/AIDS

1. Findings from secondary data

o Prevalence Rates

In accordance with UNAIDS Overview of the Global Aids Epidemic (2006), Swaziland is the country that has the highest prevalence rate of HIV in adults (15-49%) in the whole world, accounting for 33.4% of its adult population. Although this figure is shocking enough, another astonishing finding is that Swaziland had the sharpest increase of prevalence rate from 2003 to 2005 when compared to the other 9 countries with the highest prevalence rate in the world. Table xxx and xxx display key HIV/AIDS indicators from UNAIDS.

When looking at statistics on HIV/AIDS pandemic directly from sentinel surveillance sites² among pregnant women the findings are even more outrageous. Since 1992 when the first HIV sentinel surveillance surveys among women were conducted, there was a sharp increase from 3.9% to 42.6% in 2004, an increase of 38.7% in 12 years

World Rank	Country	2003	2005	Percentage Points Increase or Decrease
1	Swaziland	32.4	33.4	1.0
2	Botswana	24.0	24.1	0.1
3	Lesotho	23.7	23.2	-0.5
4	Zimbabwe	22.1	20.1	-2.0
5	Namibia	19.5	19.6	0.1
6	South Africa	18.6	18.8	0.2
7	Zambia	16.9	17.0	0.1
8	Mozambique	16.0	16.1	0.1
9	Malawi	14.2	14.1	-0.1
10	Central African	10.7	10.8	0.1

Source: UNAIDS 2006

	2005
Prevalence Rate Adults (%)	33.4
Young women (15-24) rate (%) 2005	22.7
Young men (15-24) rate (%) 2005	7.7
# People Living with HIV/AIDS	220 000
# Adults (15+) living with HIV/AIDS	210 000
# Women (15+) living with HIV/AIDS	120 000
# Children (0 to 14) living with HIV/AIDS	15 000
Deaths in adults and children 2005	16 000
Orphans (0-17) living	63 000

Source: UNAIDS 2006

² Although UNAIDS bases its analyses on sentinel sites, it controls for the likely over-estimation of sentinel sites. The national statistics do not control for this bias and therefore presents higher estimates.

Administrative region	N	Sum of deaths in all age	Sum of deaths between 15 and 49 yrs	Sum of deaths between 0 and 5 years old	% Households by HIV Proxy		
					Any deaths from any causes (15-49yrs)	Any deaths from chronic illness causes (15-49yrs)	Any chronic illness preventing members to work (15-49 yrs)
Hhohho	237	25	15	4	5.5	3.4	9.7
Manzini	240	27	21	4	8.8	5.4	7.1
Shiselweni	231	39	21	3	7.4	3.9	16.9
Lubombo	261	28	10	6	3.8	2.7	12.6
Total	969	119	67	17	6.3	3.8	11.6

Turkey Post-Hoc test of differences

No significant differences No significant differences

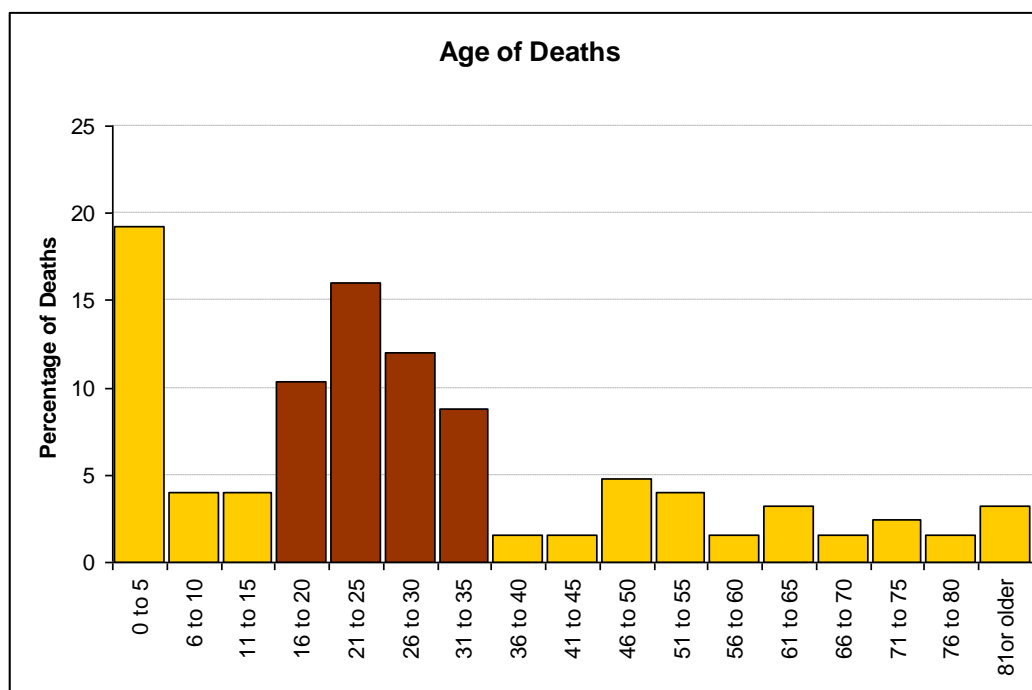
Shiselweni & Hhohho: Sig <0.1; Shiselweni & Manzine: Sig=0.05

(Socio Economic Impact of HIV/AIDS in Swaziland, 2006 report). The report went on to show that the majority affected age groups (56.3%) ranges between 25 – 29 years old while the most affected Regions are Manzini and Shiselweni.

2. Findings from primary data

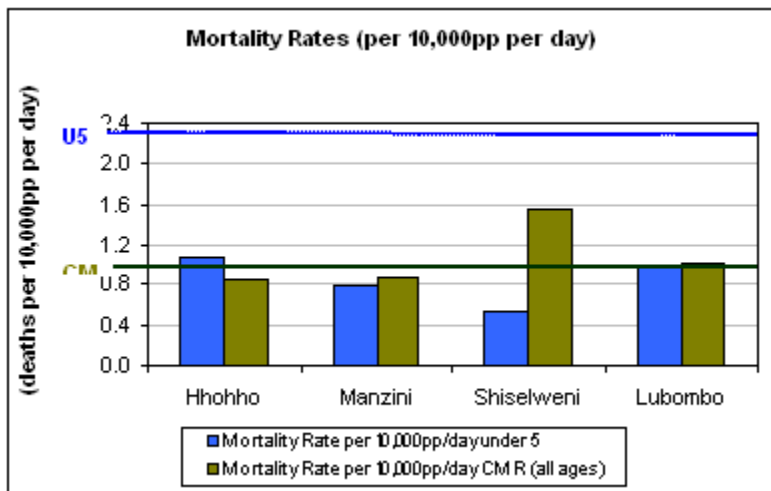
o AIDS Proxies

There were five types of proxies used to assess the impact of AIDS on households. The proxies were: (i) Chronic illness, (ii) Deaths among adults 15 to 49 years, (iii) Deaths among adults 15 to 49 years followed by chronic illness, (iv) Deaths or serious illness shocks, (v) Presence of orphans in HH. Table xxx illustrates key distribution of AIDS indicators per administrative region.



The household (HH) data from this survey allows for some assessment of the severity of the pandemic. A simple histogram illustrating the distribution of deaths by age shows the unusual peak of deaths between the age of 20 and 40 years old (see graph xxx).

The death rates³ were also calculated for each administrative area. In order to compare findings with standard threshold holders, two types of death rates were calculated: (i) under 5 mortality rate and (ii) crude mortality rate. UNICEF emergency threshold for Sub Saharan Africa (SSA) are displayed in box xxx. When the findings were graphed for each administrative region another appalling finding were noted: all areas of Swaziland are way below the emergency threshold for under 5 mortality emergency rates for SSA. On the other hand, all regions are either at the boundary or above the emergency cut-off for crude mortality rate. Graph xxx illustrates findings per administrative area, where Shiselweni is of specific concern.



Box xxx: Calculation and Standards for Mortality Rates
Mortality per 10,000 pp per day = (# deaths in surveyed HHs / (# pp in surveyed HHs * 180 days)) * 10,000
UNICEF emergency threshold for Sub Saharan Africa:
Crude Mortality Rate 0.9 (CMR)
Under 5 Mortality Rate = 2.3 (U5MR)

The same history is drawn by the occurrence of chronic illness. In Shiselweni, almost 17% of households (HHs) had at least one member who was prevented to work because of chronic illness⁴. Table xxx illustrates key chronic illness findings, occurrence of death and/or serious illness shocks and presence of orphans.

Administrative Region	% HHs with at least one member chronically ill
Hhohho	9.7
Manzini	7.1
Shiselweni *	16.9
Lubombo	12.6
Total	11.6

Administrative region	N	% HHs suffering with illness or death shocks
Hhohho	237	14.3
Manzini	240	22.5
Shiselweni	231	22.1
Lubombo	261	14.6
Total	969	18.3

Administrative region	N	% HHs with orphans
Hhohho	237	38.8
Manzini	240	43.8
Shiselweni	231	51.9**
Lubombo	261	39.8
Total	969	43.4

** Dif valid at p<0.05 for Shiselweni in relation to Hhohho and Lubombo

* Difference between Shiselweni and Hhohho significant (p<0.1); difference between Shiselweni and Manzini significant (p<0.05) – turkey Post-Hoc test

Differences not valid (p>0.1)

⁴ Difference between Shiselweni and Hhohho significant (p<0.1); difference between Shiselweni and Manzini significant (p<0.05) – turkey Post-Hoc test

members from your HH died? Specify age and sex of each member, and specify by total HH population for the same area, the number of days in six months (180 days) to result on number of deaths per 10,000

○ Towards assessing relationships between AIDS proxy and vulnerability indicators

Table xxx illustrates main vulnerability findings per type of proxy indicator and statistical validity. A few highlights are found:

- There is no difference in occurrence of any proxy by socio-economic status
- For all households with proxies showed higher levels of coping strategies, with 27 to 33% more households being classified as worse coping strategy index
- Households with deaths or chronic illness showed lower dietary diversity
- Households with chronic illness got more loans than household without any chronic illness
- Households with deaths or chronic illness tended to have more orphans
- School drop out rates differences were between 69 to 200% greater in households with proxies compared to those without proxies. Households having orphans showed 306% more drop out rates than households without orphans
- Rates of missing school were also higher among households with deaths or caring for orphans
- Mothers' body mass index was slightly lower in households caring for orphans
- Anthropometric measures of children smaller than five years old were not different for households with proxies

Type of Proxy	Presence of proxy	N	% HH being poorest	% HH has worse coping Index (>=4)	Weighted Food Diversity	% HHs getting loan last year	% HHs with orphans	% HHs with children dropped out of school	% HHs with children missed school	Mean Mother's BMI	% HHs with at least one child is Wasted	% HHs with at least one child is Stunted	% HHs with at least one child is Underweight
Death of member (15-59yrs)	None	743	34.29	21.53 *	28.15 *	20.54	41.05 **	9.53 *	17.97 **	27.5	2.56	34.64	13.31
	At least one	226	33.79	27.43 *	26.44 *	25.45	51.33 **	16.19 *	24.32 **	26.7	2.79	38.55	12.85
Chronic illness of member (15-59yrs)	None	857	33.53	21.47 **	27.98 +	20.85 *	41.89 **	10.15 **	19.31	27.3	2.79	35.29	13.09
	At least one	112	39.25	33.93 **	25.99 +	28.18 *	55.36 **	18.10 **	20.54	26.8	1.18	37.65	14.12
Orphans living in the HH	None	548	36.06	19.71 **	27.6	20.96	-	5.75 **	17.23 **	27.9 **	2.33	36.05	11.63
	At least one	421	31.71	27.08 **	28.0	22.65	-	17.60 **	22.30 **	26.4 **	2.99	34.93	15.22
Total		969	34.18	22.91	27.75	21.69	43.45	11.06	19.45	27.3	2.61	35.56	13.20
* sig at p <0.1				** sig at p<0.05									
				+. sig at p<0.15									

Programmatic Recommendations

The links between ill health and poverty are well known and provide a powerful argument for placing responses to AIDS at the centre of the international development agenda (WHO, 2001, UNAIDS 2006). Nevertheless, it is important to stress that AIDS mitigation cannot be seen as an alternative to HIV prevention: it is a vital part of a

comprehensive global response to AIDS. In cost-benefit terms, any success in preventing infection today represents

huge savings in money and effort in the future (UNAIDS 2006). Therefore it is necessary to address HIV/AIDS in an integrated manner. A few general recommendations are:

Decrease the Impact of the Pandemic

- Increase antiretroviral therapy coverage. Studies in Sub-Saharan Africa have concluded that access to ART can have a rapid impact not only on the health of someone living with AIDS, but on their social and economic life. The study found that within six months of beginning treatment, the likelihood of the patient participating in the labour force increased by 20% and weekly hours worked increased by 35% (Thirumurthy et al. 2005, UNAIDS 2006).
- Increase social support nets for households affected by HIV/AIDS. In China the program included free schooling for children orphaned by AIDS, care and economic assistance to the HHs living with HIV/AIDS. Other options include welfare programmes, child and orphan support, public works to provide employment, state pension systems, destitution allowances and microfinancing. Since people most affected by AIDS are those who are least able to pay for services, specifically pro-poor payment strategies such as payment exemptions and vouchers for people below a certain income threshold may need to be instituted in places where medical services involve user fees (Onwujekwe and Uzochukwu, 2005, UNAIDS 2006). Recently, UNICEF commissioned a massive study of social protection interventions aimed at reaching orphans and other children made vulnerable by AIDS in 15 countries of eastern and southern Africa. Findings from such studies should be used to target programs

Decrease the infection rates

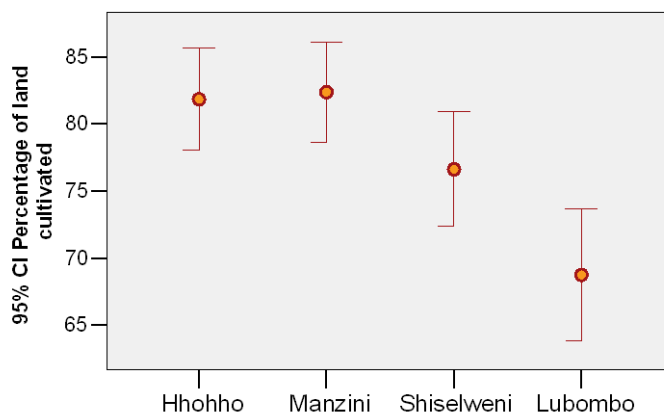
- Free drugs to HIV-infected pregnant women to prevent mother-to-child transmission, and free HIV testing of newborn babies;
- Increase dissemination of knowledge on prevention and treatment of HIV/AIDS, including free and easy access to condoms
- Decrease vulnerability and poverty.

II. Production Levels

SWAZILAND VAC to include food balance sheet

Primary data from the HH instrument show that production levels have some limiting factors. First of all, it was noted that households are not planting the whole land they could potentially cultivate. Graph xxx shows that the mean percentage of land cultivated varies from 82% in Hhohho and Manzini to less than 70% in Lubombo. Table xxx shows that although most households have used fertilizer (which include manure and other organic wastes), few households have access to fertilizer. The situation is especially of concern in Lubombo, where less than 20% of HHs used any fertilizer during last agricultural season. Sources of seeds for the main crop (which was usually maize) included mainly purchase and reserve from previous harvest, with all regions showing high levels of use of reserves.

Percentage of Land Cultivated (for who cultivated)



Administrative region	Sample Size (N)	Use of enhances		Source of Seeds			
		Use any fertiliser	Use any pesticides	Purchase	Reserve from previous harvest	Aid (NGO, GoS)	Others
Hhohho	208	73.7	29.8	60.1	30.3	3.8	5.8
Manzini	217	91.5	27.1	66.4	23.5	4.1	6.0
Shiselweni	222	81.7	46.7	45.0	41.9	5.9	7.2
Lubombo	198	99.5	19.1	54.0	23.7	12.6	9.6

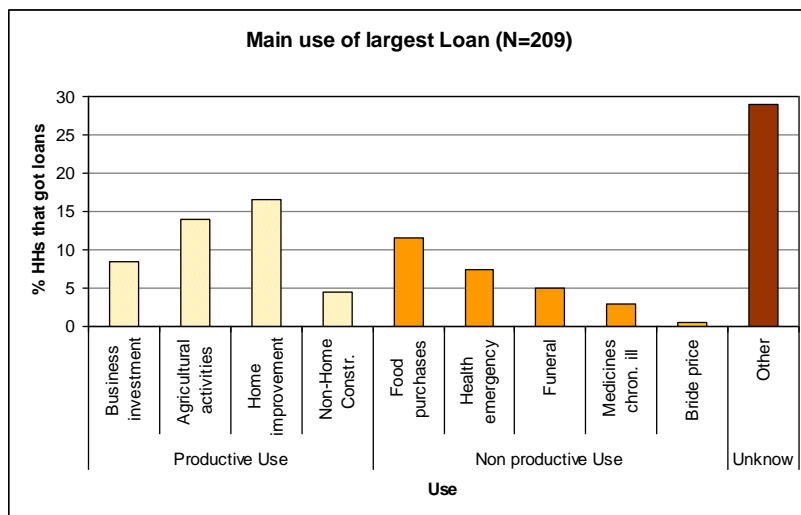
Questions concerning main type of crops were included in the HH survey. HHs were asked to prioritize type of crops they planted. Graph xxx illustrates findings per administrative regions. It can be noted that the main crop for all regions was maize. In Lubombo, more than 20% of HHs said that they did not have any 'main crops'. Crop diversification was better in Shiselweni, where almost half of the households had four different types of crops. The worse diversification of crops was in Lubombo, where less than 15% of HHs had four crops.

Programmatic Recommendation:

Agricultural development programs are in need especially in Lubombo. Programs should focus on facilitating access to pesticides and storage of harvests and seeds. Programs for diversification of crops should also be carried out in Lubombo.

In order to improve the credibility and accuracy of cereal balance sheets, studies aiming to quantify the cereal food requirement in Swaziland should be done.

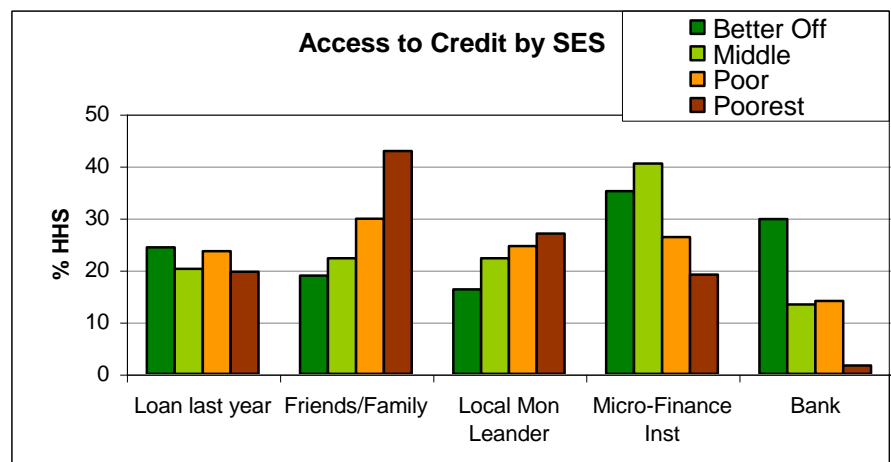
III. Access to credit



It has been widely accepted that access to credit is a main factor of vulnerability. Therefore, specific questions on access to credit and loans were covered in the household instrument. It was noted that in average 22% of households got some kind of credit in the previous 12 months before the assessment. No significant difference was seen for the different administrative regions. There are three main sources of loan in Swaziland : friends/family (30%),

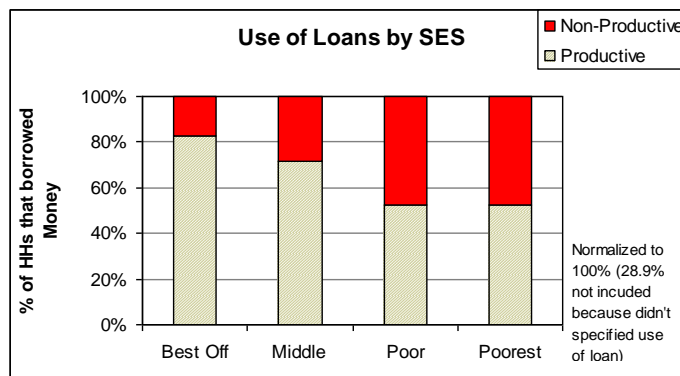
micro finance institutions (30%) and local money lender (23%). Almost 30% of the households that received loans used them for non-productive (essential) objectives, such as food purchases, health emergencies, funeral and medicines. Home improvement was the main productive use of loan, followed by agricultural activities. Less than 10% of the households used loans for business investment. Graph xxx illustrates main findings of use of loan.

As it has been widely accepted, access to credit can be the ‘spark’ for the poorest and poor to break the vicious cycle of poverty. Nevertheless, the findings from who got access to credit by Socio



Economic Status (SES) were rather discouraging. Graph xxx shows that although the same percentage of households from the different SES accessed credit in the previous 12 months, the source of credit was different for the groups. While more than 40% of the poorest received credit from family and friends, only 20% of the better-off and middle accessed credit from the same source. On the other hand, while 35-40% of the better SES received credit from micro-economic institutions, less than 20% of the poorest accessed the same source. The same pattern was seen for banks.

The use of credit was also different between better and worse SES. Among poorer SES, about 50% of the households used largest loan for non-productive purposes⁵ as compared to less than 20% of the better-off and 30% of the middle.



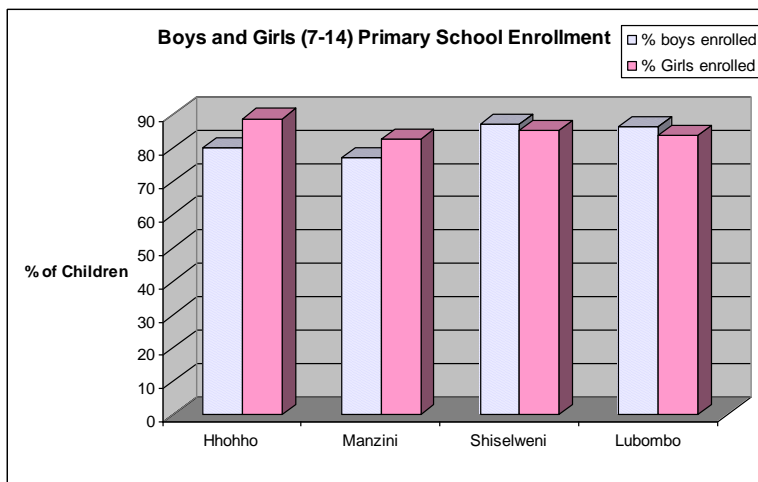
IV. Access to education

In Swaziland, around 73% of primary aged children are enrolled in primary education. However, only 29 to 36% of children of secondary aged youths are enrolled in secondary education (UNICEF, 2000-04). Table xxx illustrates the number of students per type of school, zone of residence and level of schooling. As one can note, the enrolment difference between primary and secondary education is extreme.

Type of School	Rural		Urban	
	Primary	Secondary	Primary	Secondary
Government School	20,050	18,509	16,620	8,534
Aided School	148,379	23,949	20,486	11,283
Private School	2,308		668	
Total	170,737	42,458	37,774	19,817
CSO Education Statistics, 2003				

⁵ Non productive purposes: food purchases, health expenditure, funerals, bride

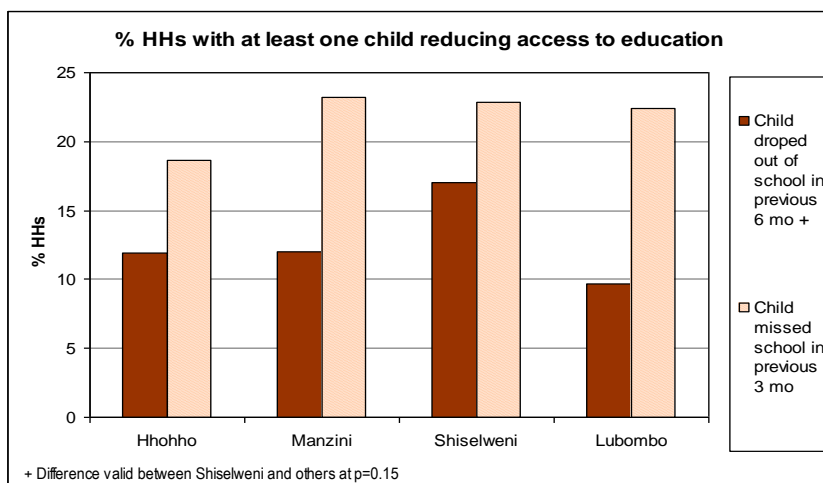
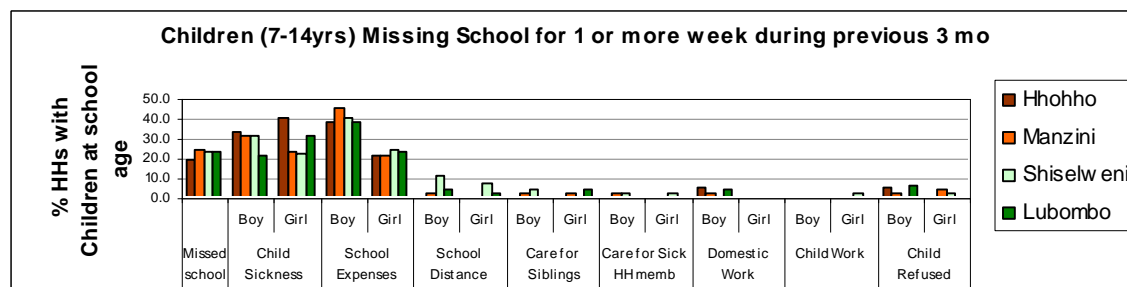
The Swaziland VAC survey only focused on primary school enrollment. The primary enrollment rates were slightly higher than the ones illustrated by UNICEF, where the net primary enrolment reached between 75 to 83% of depending upon the administrative region and gender of child (see graph xxx). Although there was



slight difference between regions and gender, these variations were not significant ($p>0.1$). When analyzing for socio-economic status, no significant difference was noted on primary enrollment rate for the different socio-economic groups.

About 20% of children missed at least 1 week of school during the previous 3 months

with regional distribution being even. The main reasons for missing schools were child sickness (30% of the HH identified it as a reason) and school expenses. It is interesting to note that while 40% of HH identified school expense as a main reason for male students to miss school, when the question was direct to female students the same was only true to 20% of HHs. The Swaziland VAC has hypothesized that such difference is due the difference in price of uniforms, where male students have higher costs. Graph xxx illustrates cause of children missing school.



School drop out rates were evenly distributed among Hhohho, Manzini and Lubombo, where 10 to 12% of households said that at least one child dropped out of school in the previous six months. Shiselweni presented higher rates of school drop outs, reaching 17% of households

(p<0.15). Graph xxx illustrates key findings on decrease of access to school.

The Swaziland VAC has made a great effort to assist in the understanding of the characteristics of households that had decreased the access to primary education for at least one primary aged child in their household. Table xxx illustrated key findings. Results show that households that have either taken a child out of school or had a child missing school tend to have suffered more unusual situation in the previous year; have higher levels of wasting, and have suffered at least one death. Although there was no difference in terms of chronic illness and children missing school, the large and valid difference of prevalence of school drop outs for the same characteristic point to the fact that chronic illness may be related to declining access to education.

Lack fo Access to School		N	Unusual situation last year	At least one child is wasted in HH	At least one member was Chronically ill	There was at least one death
Missed School	No	661	62.7 **	1.4 **	12.0	23.3 *
	Yes	184	74.0 **	4.9 **	12.5	29.3 *
Dropped Out of School	No	703	64.1 **	1.1 **	11.0 **	23.0 **
	Yes	100	76.5 **	8.0 **	18.0 **	33.0 **
Total		803	65.6	2.0	11.8	24.3

** Difference valid at p<0.01, * Difference valid at p <0.05

There was no significant difference between lack of access to school indicators and socio-economic status (p>0.4), even when controlling for the four significant indicators' relationships described above.

V. Water and Sanitation

Water and sanitation are a major concern for food security because of the relationship it has with acute illnesses, which in turn impact the utilization of food and nutrition status of children.

In order to assist programme that focus on food security in general and water and sanitation in specific, the Swaziland VAC carried out some analyses on access to water. Access to improved water source was problematic in all regions, with Lubombo being the worse-off where only 19% of households have access to improved water source. Hhohho was the relative better region in terms of water source where about half of the households had access to improved sources.

Administrative region	N	% HHs with Improved water source (1)	% HHs time to get water < 15 min. - Rain season	% HHs time to get water < 15 min. - Dry season
Hhohho	237	53 ****	71.0 *	57.9 *
Manzini	240	41 **	66.4 *	59.1 *
Shiselweni	231	35 **	45.5 ***	30.4 ***
Lubombo	261	19 ****	45.1 ***	27.4 ***
Total	969	36	56.9	43.5

**** Different from all other area (p<0.05)

*** Different from Hhohho, and Manzine (p<0.05)

** Different from Hhohho and Lubombo (p<0.05)

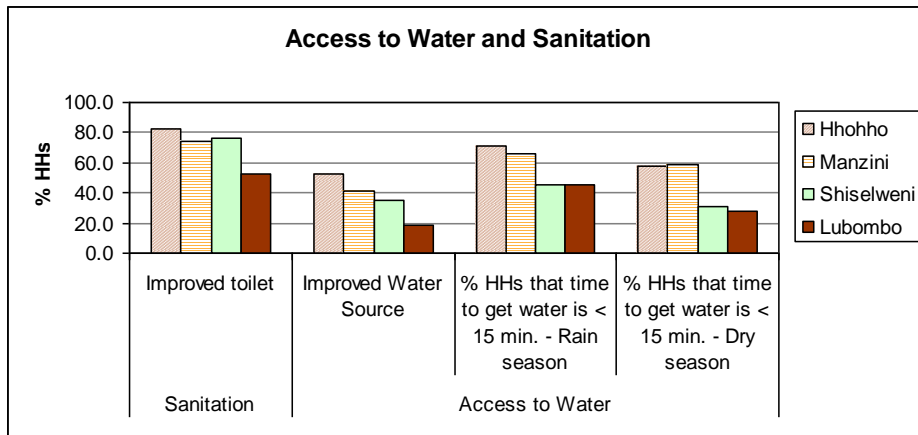
* Different from Shiselweni and Lubombo

(1) public, borehole, proected dug

Not only the source of water is important, but also the distance (or time) to fetch water. The results show that Lubombo and Shiselweni are the two administrative areas that are of most concern as even during the rainy season less than

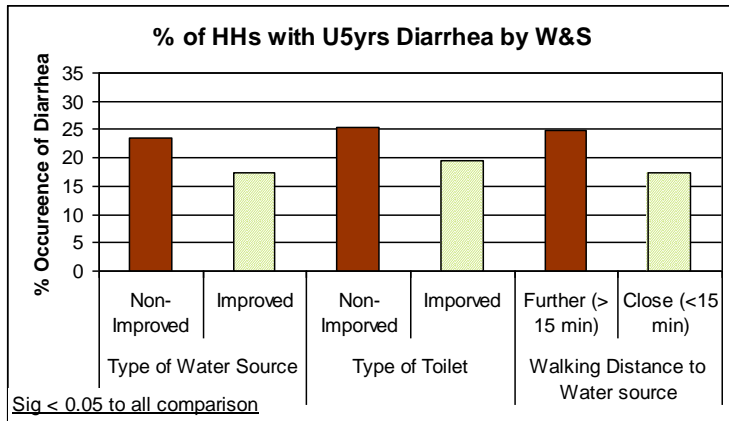
half of their population can gather water in less than 15 minutes (as it compares to 71% in Hhohho). During the dry season the situation is even worse, with 30% or less of the households getting water in less than 15 minutes in these two areas. Table xxx illustrates key findings of access to water.

Access to improved sanitation was to a better than sources of water in all areas. Lubombo was once more the worse region, where half of the population have no access to improved toilet types (difference valid at $p < 0.05$ between Lubombo and all other regions). Graph xxx summarizes key findings per region.



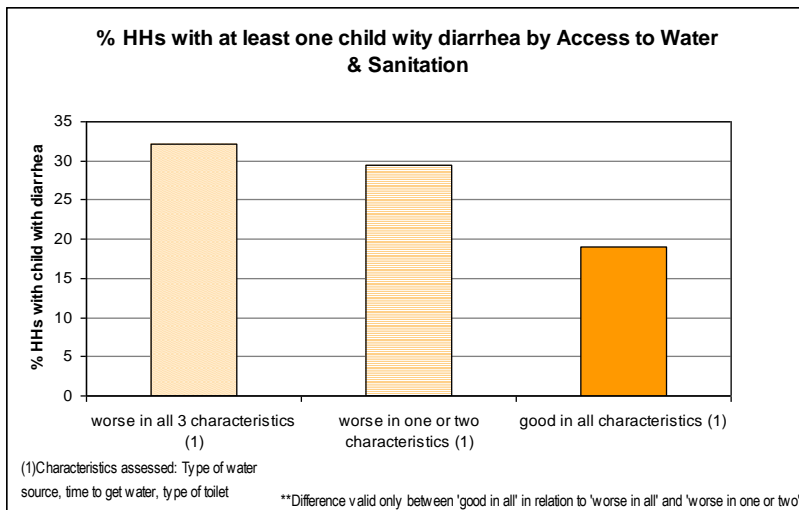
3. Water and Sanitation and Water borne diseases (Diarrhea)

Relationships between poor sources of water and sanitation have been described elsewhere and are supported by



the data analyzed by the Swaziland VAC. Statistically valid differences between access to water/sanitation and occurrence of diarrhea were found and key results are displayed in graph xxx. The findings show that households with non-improved water source had 6 percentile points more diarrhea than improved source and that households with non-improved sanitation had 5.9

percentile points more diarrhea than improved toilet facility. Valid differences were also found concerning the distance to water source where households further than 15 minutes from closest water source had 7.3 percentile points more diarrhea than households within shorter distances.



When combining the three indicators of water and sanitation (access to improved source of water, time to fetch water and toilet type) it was seen that there was no significant difference between the quantity of negative indicators. In other words, the impact of either lack of access to improved water, distance to water source or toilet has the same effect even if the household has access to another indicator. Graph xxx shows that while diarrhea levels in HHs that have worse access to the three indicators is 32%, the prevalence was almost 29% among HHs that have improved access to either one or two other indicators. The short difference and the lack of statistical validity show that diarrhea levels are not expected to decrease even if one sector is improved.

VI. Access to employment/income

Swaziland is currently suffering an unemployment rate of 40% (2005 est.) as observed by the World Fact Book. The situation is exacerbated by the fact that most of farmers in Swaziland are subsistence farmers with very little hope getting upgraded in the near future. Therefore the little that they produce does not take through the season thus resolving to purchase as a survival strategy.

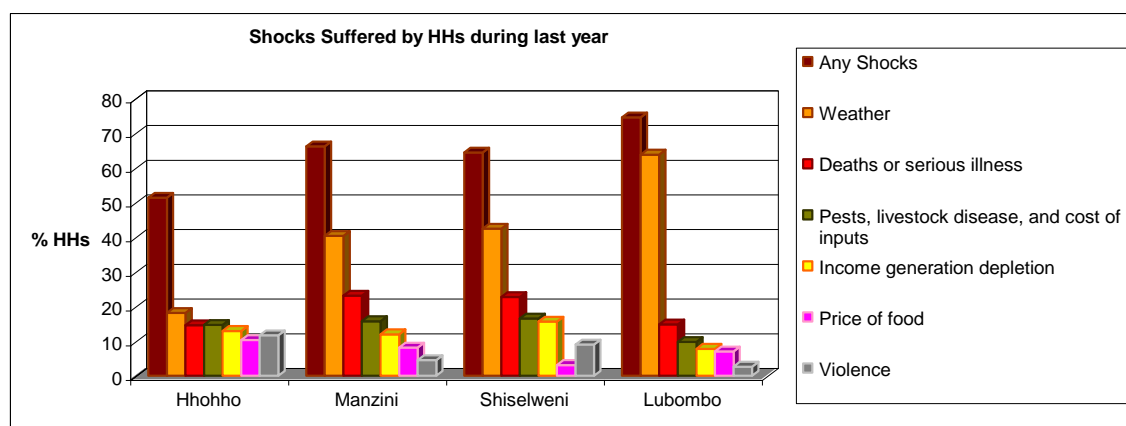
The closure of major manufacturing companies in urban areas, retrenchment from South African mines and limited domestic employment opportunities are keys to the high unemployment rates. The majority of rural people depend on cash income for survival especially where long dry spells and droughts are experienced. Crop production is only one of many survival strategies. Their lives in some quarters are difficult as result of the average 40% unemployment rate and the poor to no harvest of stable crop.

The primary data collected by the Swaziland VAC show similar patterns with a 46 to 67% of HHs not having any formal or skilled source of income. The situation is specially problematic in Shiselweni and Lubombo. Table xx illustrate key findings on sources of livelihood.

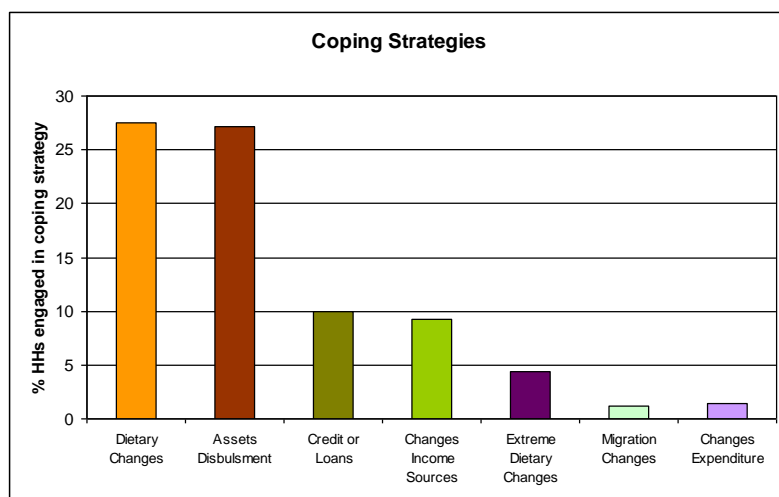
Administrative Region	N	Source of Livelihood			
		Agricultural	Formal/Skilled	Non-Agr. Non-Formal/Skilled	Food Aid Only
Hhohho	237	65.8	54.0	5.9	1.3
Manzini	240	49.6	47.1	19.6	1.7
Shiselweni	231	61.5	35.1	11.7	8.7
Lubombo	261	49.8	32.6	17.6	7.7
Total	969	56.4	42.0	13.8	4.9

VII. Shocks and Coping Strategies

Between 50% and 73% of the HHs mentioned to have suffered some unusual shocks during the previous 12 months that have limited their ability to eat, live and retain assets in the manner they were used. While in Lubombo more than 60% of the HHs identified the shock as a weather related event, the same was only true to 18% in Hhohho, and about 40% in Manzine and Shiselweni. Shocks related to deaths and/or serious illness was identified by more than 20% of the HHs in Shiselweni and Manzini. Graph xxx illustrates occurrence of shocks per administrative region.



Coping strategies included mainly non-extreme dietary changes (i.e. decrease portion sizes, decrease number of meals, eat less preferred food, and consumed more wild foods) and assets disbursement (spent savings, sell of

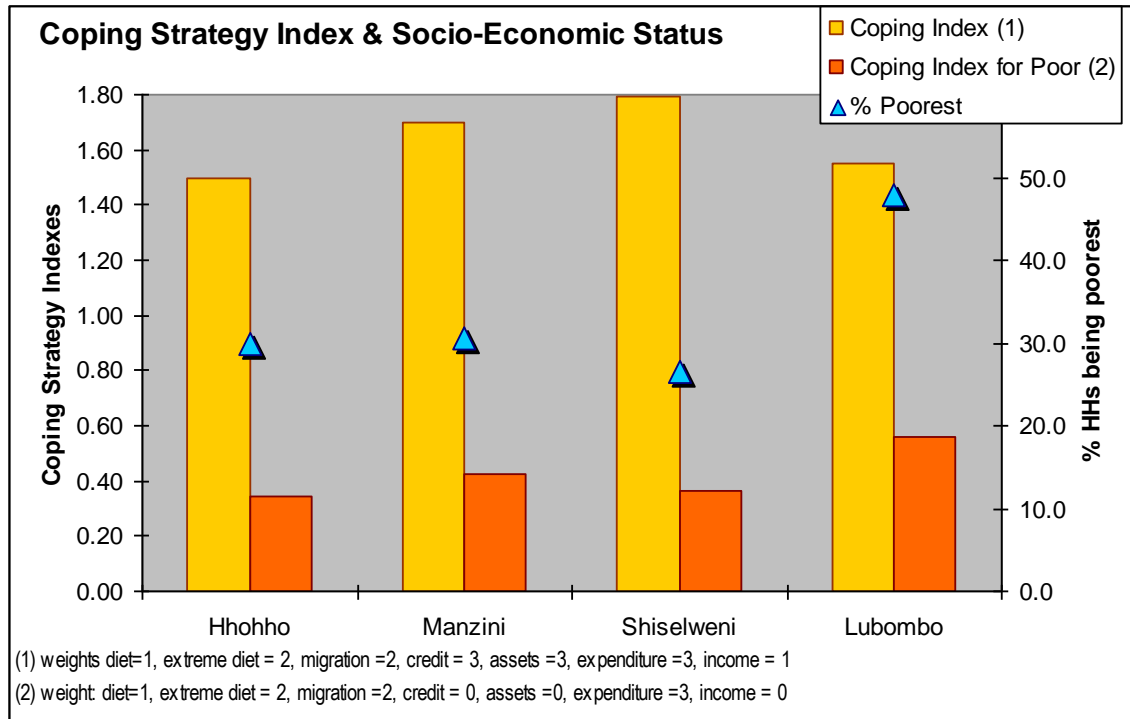


HH assets, agricultural tools, building material, furniture, and livestock). For the whole population surveyed, about 27% of HHs were engaged in dietary changes, 27% of HHs were engaged in asset disbursement, and 10% of HHs got some form of loan and/or credit and changed type of income source. Graph xxx illustrates key findings.

Two types of coping strategy index⁶ was developed for Swaziland. The first one

⁶ Coping Strategy Index was developed by CARE and Tango, Maxwell et al 1999

followed the recommendations on weighting all types of coping strategies⁷ and the second one was tailored to cater for poorer households and only included non-asset and income dependent strategies. While there was no statistically valid difference between the coping strategy index for the different regions, the coping strategy index catering for the poorer HHs showed valid difference ($p < 0.05$) between Lubombo and all other regions. As it was seen before, Lubombo had the largest occurrence of shocks but is also the region with largest proportion of HHs being identified as poorest. Graph xxx illustrates key findings of CSI and socio-economic status.



VIII. Dietary Intake

Dietary intake was measured by qualitative questions done to the HH. The questions included number of meals eaten in the previous day and the number of days (out of 7 days) in which each of the 17 food items/groups were eaten in the HH. The Mozambican Ministry of Agriculture⁸ has developed the Mozambican Dietary Adequacy Intake rapid tool to come with weights and classifications for dietary diversity. Dietary diversity was

⁷ Dietary changes received a weight of 1, extreme dietary changes received 2, migration received 2, credit and/or loans received 3, assets disbursement received 3, change on expenditure received 3 and change on income received 1

⁸ Rose et al, 2002

calculated based on these rapid tool where the number of times an item was eaten was multiplied by its weight⁹. Based on this tool, any diet of 11 or less points is classified as very inadequate. Table xxx illustrates percentage of HHs being identified as having very inadequate diet and the mean weighted dietary diversity. From these findings it can be noted that Lubombo has the lowest mean dietary diversity score ($p < 0.05$) and it presents almost 14% of its population being classified as having a very inadequate diet.

Administrative Area	N	% HHs with Very Inadequate Dietary Diversity	Mean weighted Dietary Diversity	Classification
Hhohho	237	3.0	31.0	Normal
Manzini	240	2.9	28.8	Normal
Shiselweni	231	3.9	27.8	Normal
Lubombo	261	13.8	23.8*	Acute Food Insecure

* Significant difference ($p < 0.05$) from Lubombo to all other regions (Turkey post hoc test)

IX. Food Utilization (nutrition outcomes)

In accordance with WHO standards of malnutrition (see table xxx) all regions were classified as having low acute malnutrition. On the other hand, all regions were classified as having medium chronic malnutrition rates. Table xxx illustrates key anthropometric outcomes.

Indicator	Low	Medium	High	Very High
Acute (Wasting < 2sd)	<5%	5-9%	10-14%	>=15%
Chronic (Stunted < 2sd)	< 20%	10-29%	30-39%	>=40%
Underweight	-	-	-	-

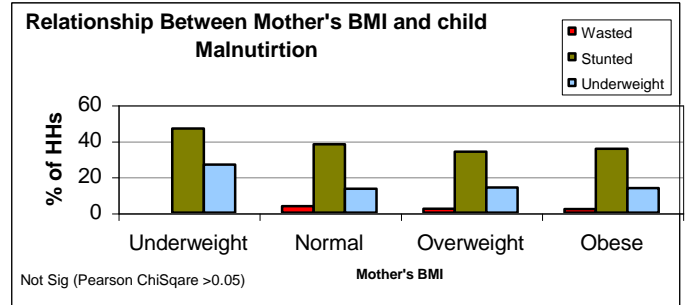
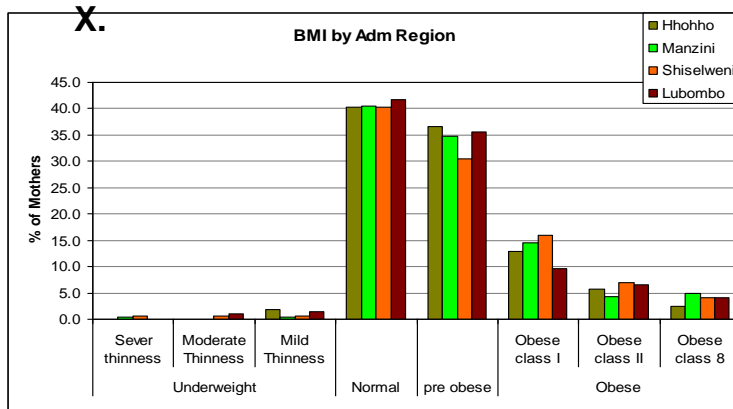
Source: WHO, FAO 2005

Administrative Area	N	Wasted (whz < -2.00 sd)		Stunted (haz < -2.00 sd)	
		% HHs	Classification	% HHs	Classification
Hhohho	291	2.4	Low	25.8	Medium
Manzini	350	1.4	Low	29.4	Medium/High
Shiselweni	218	1.4	Low	29.4	Medium/High
Lubombo	327	1.5	Low	26.3	Medium

Women body mass index did not show any abnormal acute malnutrition, with less than 3% of all women being classified as having some kind of underweight. About 40% of the women were classified as normal and further 30 to 35% of women were classified as pre-obese. About 30% of women were classified as being obese. Graph xxx illustrates findings per administrative region.

⁹ Cereals and tubers received a weight of 2, beans and groundnuts received a weight of 3, animal protein received a weight of 4, and oils, fats and sugar received a weight of 1

Although no valid relationships were found between mother's BMI and child malnutrition rates, an apparent relationship between underweight levels of mothers and children were noted. Graph xxx illustrates relationships.



Acute Access to Food

As explained in the Analytical Methodology Section, two step clusters analysis¹⁰ was used to identify the households that lack access to food. The variables entered and the main outcomes are described in the same methodological section, where it is noted that four clusters are naturally grouped as:

- Lacking Access to Food (here referenced as “food insecure”)
- Receivers of Food Aid
- Moderate to Good Access to Food (here joined with Best Access to Food to facilitate analyses)
- Best Access to Food (here joined with Moderate Access to Food to facilitate analyses)

Box xxx: The unknown food access situation of food aid receivers

One main problem that the Swaziland VAC has faced in analyzing the food access situation of the rural population of Swaziland is the fact that a large percentage of the sampled HH were receiving food aid. Food aid impacts the very indicators used to assess access to food, these being mainly the dietary intake, and expenditure patterns. It is not surprisingly therefore that one cluster where 70% of the HHs received food aid was formed. The fact that these households are not evenly distributed but rather located mainly in Shiselweni and Lubombo, where about 40% of the total HHs interviewed had food aid as they main source of maize, further confuse findings. In other words, the HHs that are receiving food aid now do not present poor indication of dietary intake, have one of the largest mean non-food expenditures, and have also planted cash crops. However, the food aid receivers do have higher prevalence of poorest HHs and coping strategies (see table xxx). So the question we feel unable to answer is: “Do the Cluster Classified as Food Aid Receivers still need assistance towards improving their access to food?” As we feel unable to respond to this question we will present findings segregated for the ‘worse off food access’, for the ‘receivers of food aid’ and for the ‘regular/best food access’.

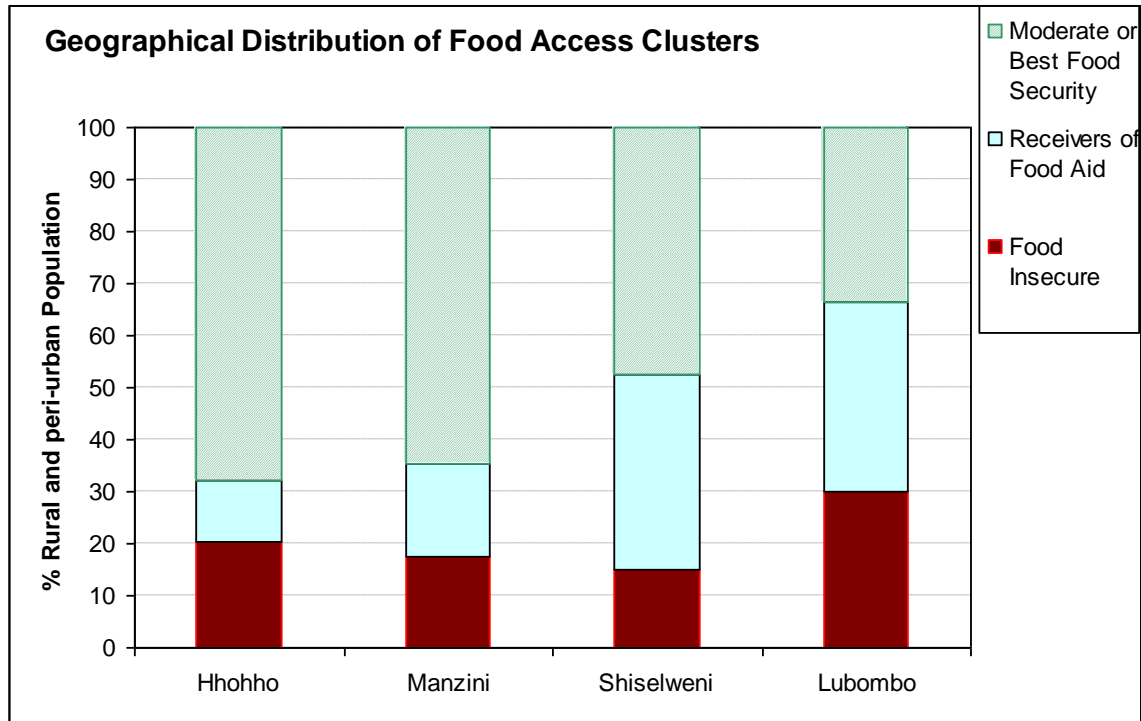
Food Access Clusters	Sample Size (N)	% HHs being poorest	% HHs having worse coping Index (>=4)	% HH having worse coping Index for Poor (>=2)
Worse Food Access	196	51.6 *	17.9	14.8
Food Aid	244	46.4 *	25.8	19.3 +
Regular	328	24.1	22.9	9.5
Best	167	18.1	24.6	13.8
Total	935	34.5	22.9	13.9

* Difference Valid to regular and best clusters ($p < 0.05$)

+ Difference Valid to regular cluster ($p < 0.05$)

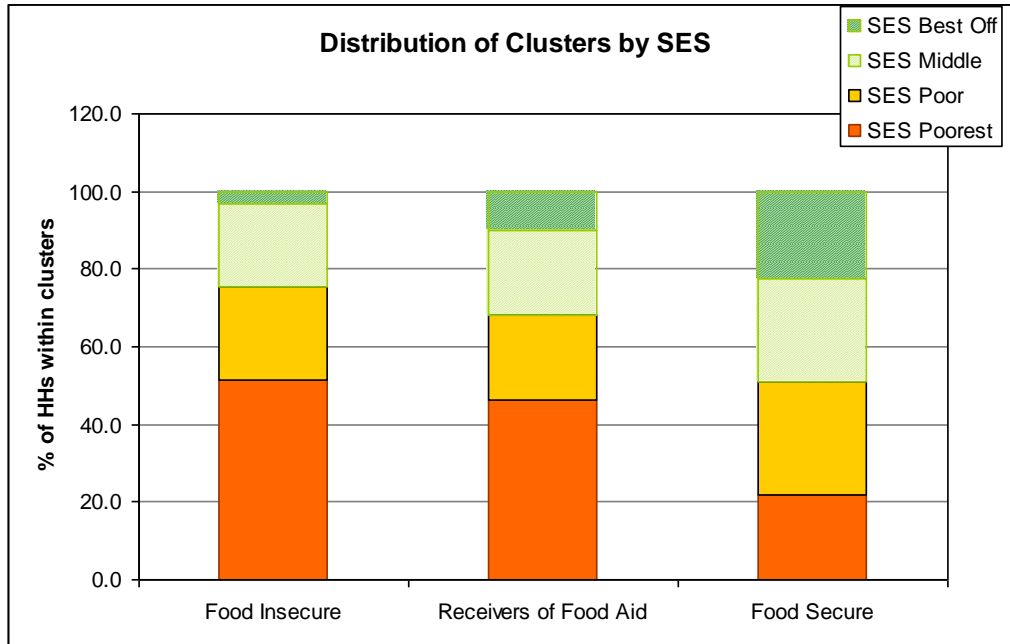
¹⁰ The TwoStep Cluster Analysis procedure is an exploratory tool designed to reveal natural groupings (or clusters) within a data set that would otherwise not be apparent. The algorithm employed by this procedure allows for inclusion of both continuous and categorical variables and allow for automatic choice of optimal number of clusters (SPSS help guide)

Geographic Distribution of Clusters



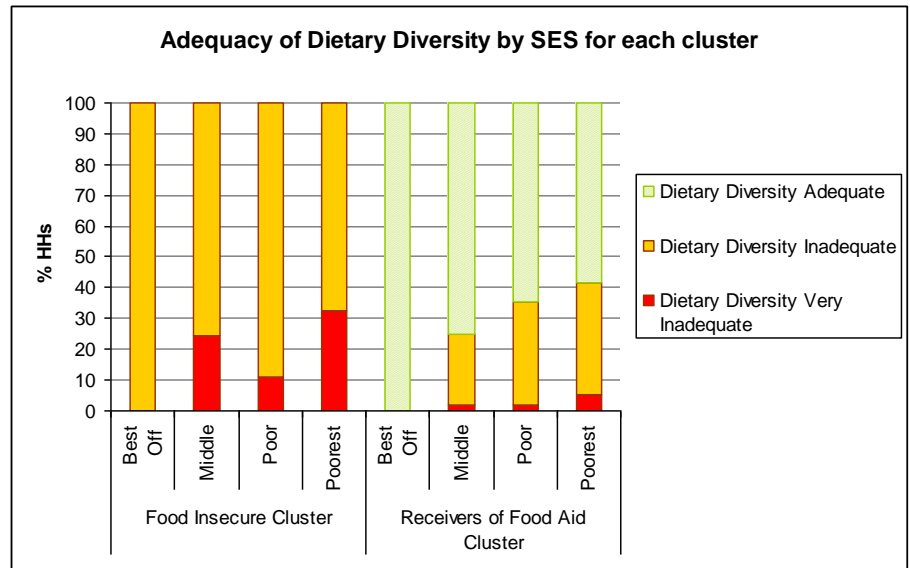
Graph xxx shows that Lubombo has the largest proportion of households that are classified as food insecure, accounting to about 30% of its population. Hhohho and Manzine present the highest proportion of food secure households, which reflects almost 70% of the rural and peri-urban population while also presenting the lowest proportion of food insecure (less than 20%). Shiselweni has also lower levels of food insecure households but at the same time it has one of the largest levels of households receiving food aid. About 50% of the households were classified as food secure in this area.

Characteristics of the Access to Food Clusters



Analysis trying to account for the socio-economic status of each group show that about half of the food insecure were classified as poorest, while only 3% were classified as best off. The cluster that was classified as receivers of food aid also presents large proportion of poorest and small proportion of best off. The two clusters that were identified as food secure presented only 20% of its population being the poorest and the same amount being the best off. Results are displayed in graph xxx.

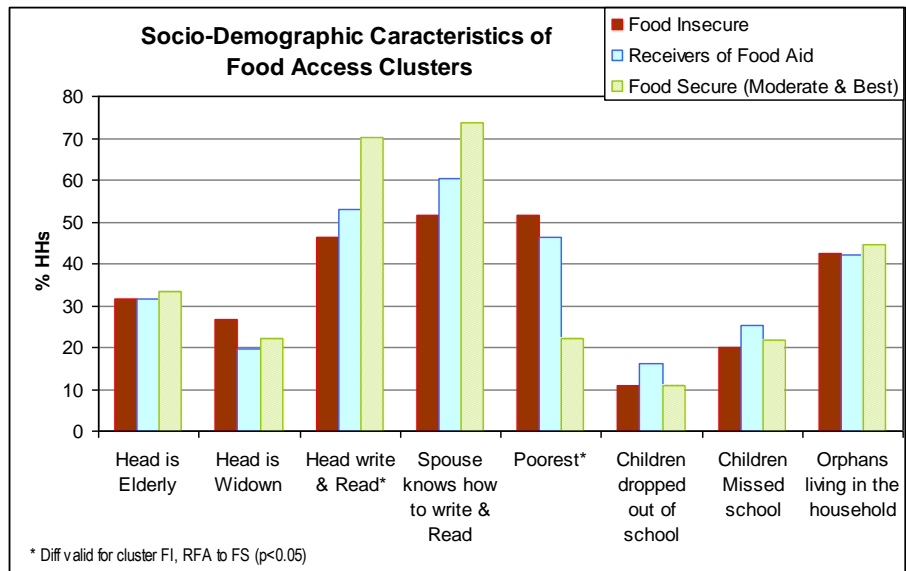
Analyses on the dietary diversity intake controlled for socio-economic status of households also shows interesting findings. First of all, it was noted that there was no cases of households being among the food secure groups and having inadequate diet.



Graph xxx illustrates findings for the two clusters where there was

the episode of inadequate dietary diversity. It can be noted that there is an apparent relationship between socio-economic status and dietary diversity within each cluster, where, households identified as best off tended to

have better diet. Although both the food insecure and the food secure have similar distribution of SES, the dietary diversity proxy was notably better for the food aid receivers' cluster.



Analyses on the socio-demographic status of the clusters of food security do not show valid difference for any indicator¹¹ except with education of head and socio-economic status.

4. Programmatic Recommendations

Access to food security is always a controversial issue to calculate. Unfortunately although many methods are available for analysis of food security, there has been little agreement on what is the most appropriate method. One key issue is that assistance to households that lack access to food should depend on what type of food insecure they are suffering (i.e. chronic or transitory). Although the next section will deal with the type of food insecurity by looking into “humanitarian clusters”, the question on whether chronic food insecure should also get relief assistance is still debatable.

We present here a combination of indicators to allow decision makers to choose the most appropriate indication for their programmatic needs. We begin by discussing the meaning of each indicator to later present the results by administrative area.

¹¹ No analyses were done for gender of head of household

Explanation of Indicators used to identify the households that lack access to food and need assistance

Access to Food

Two groups might be of concern to decision makers: the food insecure group and the receivers of food aid. Because it is not possible for us to know what would be the situation of households currently receiving food aid if they would stop benefiting from it, we decided to give always two separate estimates: one for the food insecure, one for the receivers of food aid.

Socio-Economic Status

This combination allows decision makers to quantify those who are food insecure and also among poorest households. The concept behind this combination lies on the fact that households that are identified as poorest may need not only relief assistance but also some kind of ‘spark’ to break the vicious cycle of poverty. Furthermore, the socio-economic characteristics of households are useful indication for prioritization of programmes.

Dietary Diversity Intake

Dietary diversity has been cited elsewhere as a good indication of current food access as it reflects an outcome measure that is not impacted by food utilization and therefore allow for further prioritization of households. In these analyses, dietary diversity has also been used as a proxy to allow for phasing of food security situation. This was based on the assumption that households that have “very inadequate dietary diversity” now (score <11), they can be classified as food insecure now. On the other hand, households that have “inadequate dietary diversity” now (score 11 to 16) may be classified as probable food insecure from October on. Because the dietary diversity intake of current receivers of food aid was usually adequate - probably as a result of the impact of food aid - no analyses for this group are presented here.

Unusual situation

The cross tabulation with households that had an unusual situation during the last year that affected their ability to provide for itself, eat in the manner they were accustomed or affected what they owned might be a indication of households that need relief assistance. This is because relief programs should focus on assisting households to recover from shocks.

5. Results of occurrence of Indicators used to identify the households that lack access to food and need assistance

The results from the various combinations by administrative area are displayed in table xxx. Note that results in this table are stratified for households classified as food insecure and current receivers of food aid. Because dietary intake among receivers of food aid was usually adequate (probably because of food aid), this variable was not analyzed for this group.

Administrative Info			% of Rural Households						Number of Rural Households					
Administrative Areas	Sample Size	Estimated Rural Population 2006*	Food Insecure and Poorest	Food Insecure and Poorest and Very Inadequate Diet	Food Insecure and Poorest and Very Inadequate Diet and Unusual situation	Food Insecure and Poorest and Unusual situation	Food Aid Receivers and Poorest	Food Aid Receivers and Poorest and Unusual situation	Food Insecure and Poorest	Food Insecure and Poorest and Very Inadequate Diet	Food Insecure and Poorest and Very Inadequate Diet and Unusual situation	Food Insecure and Poorest and Unusual situation	Food Aid Receivers and Poorest	Food Aid Receivers and Poorest and Unusual situation
Hhohho	224	318,602	11%	2%	0%	4%	4%	4%	35,558	5,689	1,422	12,801	14,223	12,801
Manzini	230	352,983	9%	1%	0%	7%	8%	5%	32,229	3,069	1,535	26,090	27,625	18,417
Shiselweni	211	240,671	5%	2%	2%	4%	16%	10%	12,547	5,703	4,562	10,266	38,781	23,953
Lubombo	250	233,794	17%	8%	6%	10%	19%	16%	39,277	19,639	14,028	24,315	44,888	36,472
Total	915	1,146,050	11%	3%	2%	7%	12%	9%	123,999	40,080	26,303	76,403	137,777	101,454

* Population Figures based on CENSUS 1997 projections for total population in 2006. Rural population calculated based on the rate of rural to urban population of 1997 multiplied by population projections for 2006