

CHAPTER 2: METHODOLOGY OF THE STUDY

INTRODUCTION

Scope of the Study

The purpose of this 2003/4 Swaziland VAC HIV/AIDS, demography and livelihoods survey has been to collect data and analyse the information to explain the impact of HIV/AIDS on the demography of the rural population of Swaziland as well the impact of the epidemic on the livelihoods of rural households. For programmatic purposes information was required at sub-national level. Large numbers of respondents were required to give the study a strong statistical basis. To operationalise the study, the decision was made to conduct a sample census in rural Swaziland. Besides generating data at Tinkundla and Regional levels, this approach facilitates a comparison with information collected in the 1997 and 1986 population censuses.

Planning and Preparation

The approach used throughout this study builds upon the experience obtained during the analysis of a Regional Vulnerability Assessment Committee (RVAC) report produced in May 2003⁵. This Swazi VAC study is the first study in Swaziland specifically designed to determine the impact of HIV/AIDS on the demography of the country and household livelihoods.

As noted in Chapter One, the initial objectives of the study were straightforward and initial plans indicated a short period required to carry out the study and analyse the data. In practice, this proved to be impossible. The schedule below demonstrates the length of time required when there are many stakeholders involved in the process and a variety of consultants providing technical support often from different countries.

Timeframe of the Study

December 2002	Population issues arise from VAC reports
January/February 2003	Discussion within the Swazi VAC and generation of study idea officially sanctioned in stakeholder meeting
March 2003	Agreement in principle by the Swazi VAC and RVAC that study should go ahead with tentative budget agreement
April/May 2003	Regional electronic discussion of questionnaire format and budget
Late May to Early June 2003	Delay until budget confirmation (following agreement of questionnaire format). Training of enumerators
June 2003	Data collection
July 2003	Data entry and start of analysis
August 2003 to March 2004	Analysis and report writing

The fourth objective of the current study, namely “to analyse and learn from the process of the study” requires that great care be taken to document and analyse the development and implementation of the methodology used in this study. This is important to enable stakeholders to draw conclusions from the lessons learned during the exercise in order to enhance the capacity of the Swaziland Vulnerability Assessment Committee (Swazi VAC) and assist NVACs or other bodies wishing to carry out similar studies elsewhere.

⁵ SADC FANR Vulnerability Assessment Committee (2003), Towards Identifying Impacts of HIV/AIDS on Food Insecurity in Southern Africa and Implications for Response: Findings from Malawi, Zambia and Zimbabwe. Harare, Zimbabwe.

QUESTIONNAIRE, PLANNED ANALYSIS AND PROXY INDICATORS

Questionnaire Design

The questionnaire was developed by the Swazi VAC over a period of two months and incorporated a significant amount of technical support from the RVAC and UNAIDS. The questionnaire was based upon a concept note drafted by the Swazi VAC. The UN, through RIACSO supported the study by producing a regional multi-sectoral framework to guide multi-sectoral assessments. The Swazi VAC drafted the first version of the questionnaire format incorporating aspects from the aforementioned multi-sectoral framework. This first draft format was circulated to various interested parties for technical input e.g. the RVAC and UNAIDS (regional office⁶ and Swaziland office). In general, the feedback was that the questionnaire focused too heavily on demography and there was a need to insert more of a food security and livelihood focus. However, there was also concern that the survey should only collect data that could practically be analysed and that the questionnaire should be as concise as possible. Following input from the RVAC, Section 4 (the livelihoods section) was added to the questionnaire.

Questionnaire Content

A copy of the questionnaire is attached as Annex 1. It was intended that one questionnaire be completed at each of the households falling within the selected sample of Enumeration Areas (EAs) (see figure 5).

The household questionnaire was divided into four sections:

Section 1 contained identifying information covering administrative details as well as the wealth ranking of the household.

Section 2 contained questions about the demographic characteristics of household members. It provided for a record of all household members further elaborated by age, gender, family relationships, status and education level. This section also focused on the level of chronic illness, maternal and paternal mortality in each household.

Section 3 dealt with mortality in the household broken down by gender, age and the presence of a bout of chronic illness prior to death.

Section 4 contained questions regarding livelihood information and focused on the ranking of food sources, income sources and changes in agricultural production.

Demographic Analysis and the use of Proxy Indicators

A standard census approach was used to collect general demographic information. The sensitivities associated with HIV/AIDS made direct questioning or testing for HIV/AIDS a difficult undertaking and it was not attempted during this survey. The methodology employed in the study needed to foster an understanding of the impact of HIV/AIDS on the population structure and the link between HIV/AIDS and changing livelihood characteristics as experienced by households. The VAC emergency assessments were not designed specifically to analyse the relationships between HIV/AIDS and household food security. It was possible, however, to utilise the variables in the assessments to explore some of these relationships using a “proxy variable” approach (see Mdladla et al, 2003, for a discussion on the opportunities and challenges present in utilising proxy variables). In a general survey it is not possible to accurately identify those households with HIV infected persons or those affected by the epidemic. For this reason use was made of a set of proxy indicators. A discussion of proxy indicators is set out below.

⁶ The involvement of the regional office of UNAIDS stems from a UNAIDS sponsored review of HIV/AIDS literature in Swaziland for the May / June Vulnerability Assessment Report which was part of a regional package of support by UNAIDS to national VACs.

Proxy indicators to identify HIV/AIDS infected and affected individuals and households fall in four broad categories:

- Mortality (for instance deaths in specific age groups occurring following chronic illnesses);
- Morbidity (for example the presence of chronically ill individuals in a household);
- Demography (for example the absence of adults measured for instance by the dependency ratio – traditional or effective (see chapter 3));
- Social relationships (such as the presence of orphans).

The paragraphs below list the specific information that was collected during the 2003 Swaziland VAC survey with an elaboration of the potential use of this data.

Mortality information

Mortality information was obtained by asking respondents the following questions:

i) During the last 12 months has any member of the household died?

If the answer was “Yes”, the age and sex of the deceased individual had to be written on the questionnaire.

ii) In addition, respondents were asked if the individual who died was ill for more than three months continuously before his/her death, or whether he/she suffered bouts of illness before dying. (This information was asked in an attempt to differentiate deaths as a result of accidents etc. from deaths that might have been the result of illnesses due to AIDS- related causes.)

Information collected in this way made it possible to calculate crude death rates by any age grouping or by sex, in addition to analysis by region, agro-ecological zone, food economy / livelihood zone or Tinkundla.

Mortality indicators can be constructed at the household level to function as HIV/AIDS proxy variables during an analysis to investigate the impact of HIV/AIDS on livelihood strategies. Examples of such proxies are:

- a) Households in which an adult died in the last year after being chronically ill;
- b) Households in which a child died during the last year after being chronically ill.
- c) Households in which the household head died in the last year after being chronically ill.

Morbidity information

Respondents were also asked whether any of the listed household members was continuously ill for more than three months or kept getting ill over and over during the last three months. Information collected in this way allowed the calculation of crude morbidity rates by age and sex.

The prevalence of chronic morbidity in a household can be used as a proxy for HIV/AIDS induced illness within households. Such proxies can be employed during an analysis to determine the impact of HIV/AIDS on livelihood strategies. For instance, the following variables can be constructed at the household level:

- a) Households with a chronically ill adult member.
- b) Households with a chronically ill child member.
- c) Households with a chronically ill household head.

Demographic information

During the survey individuals living in a household were listed in the questionnaire. Interviewers completed the questionnaire by asking the age and sex of each individual, his/her relationship to the head of the household, and their marital and residency status. The availability of this kind of information made it possible to calculate a variety of age and sex specific indices. It is also possible to construct indicators to employ as explanatory variables

when analysing the link between household structure and for instance livelihood strategies. Examples are:

- a) The “*standard* dependency ratio” (the age group 0-14 and 60 + as a ratio of those aged 15-59) within each household.
- b) The “*effective* dependency ratio” in a household, calculated by excluding ill adults from the denominator.

Social Information

The presence of orphans in the household and the absorption of orphans from other households are a direct indication of parental deaths and also a possible indication of the dissolution of other households. During the survey, a set of questions was directed to capture information on household members younger than 15 years to measure the prevalence of orphanhood. Firstly, respondents were asked if the natural mother of each child in the household under 15 years was still alive. If not, did she die during the last 12 months? Information on the status of the natural father was also collected and whether, if deceased, he died during the last 12 months.

The availability of orphan data made it possible to calculate maternal orphan rates, paternal orphan rates or even “double orphan” rates by any specific age grouping or even sex. The information also allowed the calculation of the number of orphans in any selected area or age group - an important item for programmatic interventions.

The information collected on orphans also made it possible to construct indicators for use as explanatory variables during analysis for instance - the presence of orphans in a household.

Data collection issues

Surveys are prone to limitations emanating from the use of the general population as respondents. A variety of reasons (the level of education of respondents, clarity of questions, ability to recall events and the willingness to supply the correct information etc.) can impact on the quality of information collected in these types of surveys. In this respect one can also refer to the sizes of the samples, sampling methodologies, and training which all have a bearing on the data.

Inclusion errors in the selected proxy indicators

There is a possibility that selected proxy indicators are not able to discriminate sufficiently between HIV/AIDS infected/affected households and those less or unaffected. The following extraction from Mdladla et al (2003) elaborates:

"By all accounts, rural areas are not very healthy environments, as shown by relatively low life expectancies in the absence of AIDS. Illnesses such as malaria, bilharzia and tuberculosis, to name a few, are common. When reporting a chronic illness in a household, a respondent would have included persons suffering from these diseases. Thus, chronic illness as a proxy for HIV/AIDS, is somewhat weakened by the presence of other diseases although the impact on the household may be the same - but not necessarily.

The same applies to deaths that occurred in a household. In the case of deaths other inclusion errors may also provide a misleading picture such as difficulties for respondents in defining the period in which the chronic illness occurred. In addition, the shock of a death, even 18 or 24 months previously, may still haunt the members with the result that such a death is recounted. In addition, respondents are required to provide a medical opinion on the cause of death i.e. “after a chronic illness”.

In the case of orphans, it should be remembered high rates of fosterage/orphanhood was found in rural areas as a result of high mortality and migration, prior to HIV/AIDS. Thus orphans do not necessarily indicate HIV/AIDS consequences.

The possibility of including non-HIV/AIDS households was increased by the wide age ranges applied to many of the morbidity and mortality indicators during the VAC surveys. AIDS related deaths are concentrated in the younger adult ages and the use of the age range 15-60, as was the case in some of the VAC surveys, probably led to the inclusion of many deaths due to other causes in the older age ranges. "

Interpretation of proxy indicators

The presence of orphans may increase food insecurity and strain the financial position of the receiving household. However, in rural households orphans depending on their age, may function as a labour source offsetting labour shortages in the household. Other factors such as the sex and age of the orphan, the socio-economic position and demographic characteristics of the host household are also important. The crude proxy: "presence of orphans" cannot detect these important nuances, and this reduces its usefulness for the purpose of analysis.

The (standard) dependency ratio is a demographically determined indicator. Apart from the impact of a reduction in the number of adults that increases the dependency ratio, the dependency ratio is largely influenced by the fertility rate of a population. Under conditions of high fertility, high dependency ratios are the norm. High fertility will be reflected in high dependency ratios independent of the HIV/AIDS epidemic. Also, higher dependency ratios due to higher mortality rates among adults are partially offset by a reduction in the dependency ratio due to high mortality among young children. Another factor that impacts upon the dependency ratio at a household level in rural areas is the out-migration of members in the economic active ages to look for employment in the urban areas. Therefore, more work needs to be done to tease out the exact cause and effect relationships of dependency at a household level.

In the case of deaths in rural areas, these may be inflated as a result of sick members returning from urban areas. Such deaths may negatively impact on remittance income, but such remittances probably ended some time before the death of that person, but they will also add to the expenditure burden and care allocation burden on the household. The impact of these deaths on household livelihood strategies needs further investigation.

CONDUCT OF THE SURVEY

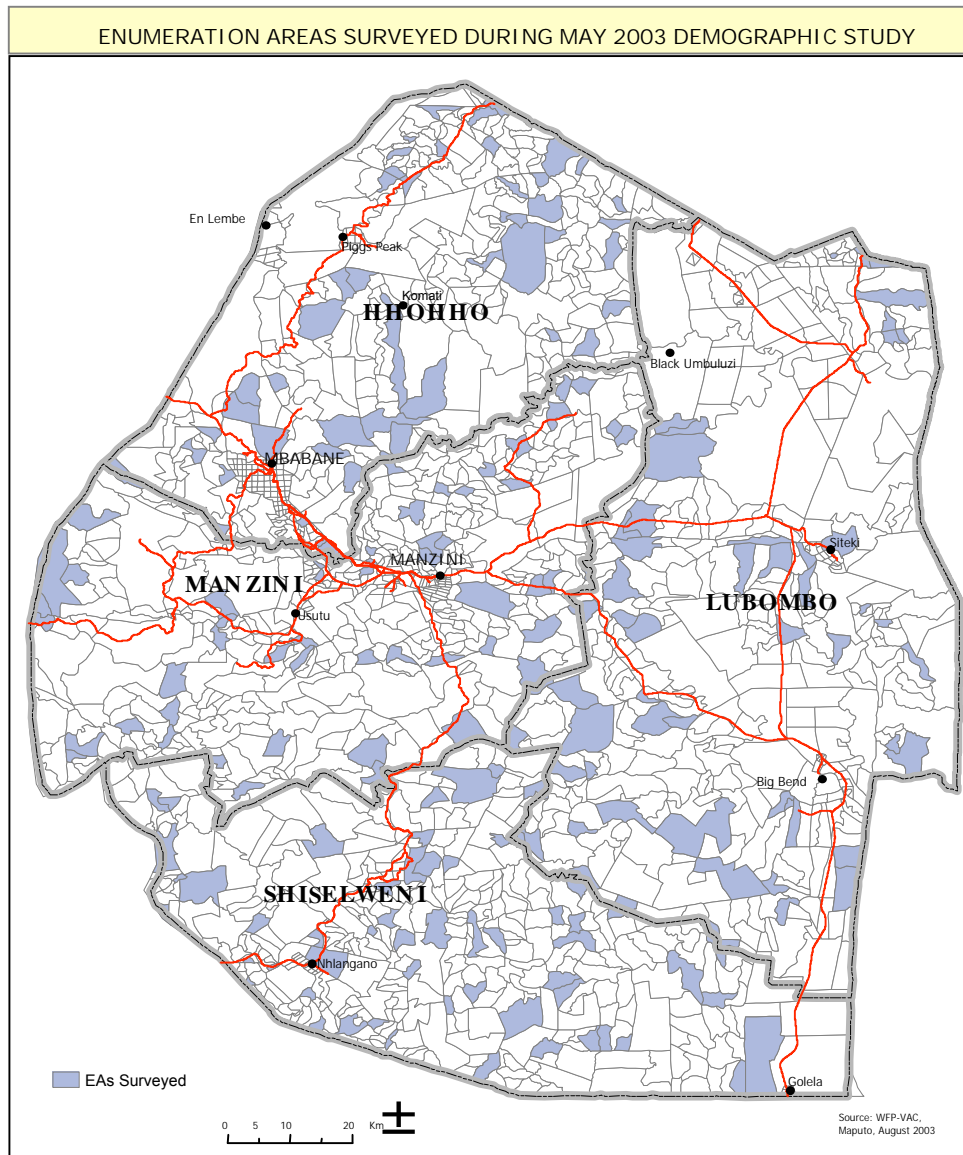
Sample design

It was determined that data records representing all households in 15% of the EAs in Swaziland would provide reasonably reliable estimates for the demographic and livelihood indicators at National, Region, Agro-Ecological, Food Economy / Livelihood Zone, and Tinkhundla levels. A total of 207 Enumeration Areas (EAs) were selected by a systematic sampling procedure with probability proportional to size (PPS), measure of size being the number of rural homesteads from the 1997 national population census (falling within 1,349 EAs in Swaziland). The EAs were representatively distributed among Regions, Agro-Ecological Zones, and Rural Development Areas (RDAs). Included is a map showing all the enumeration and district boundaries in Swaziland (Figure 5).

Enumeration areas classified as urban or private company estates were excluded from the sample. All EAs were classified according to Region namely Hhohho, Manzini, Shiselweni and Lubombo. EAs were also classified by agro-ecological zone (Highveld, Middleveld,

Lowveld and Lubombo Plateau), food economy / livelihood zone and by type of land tenure system (SNL-RDA, SNL-Non RDA, and ITF)⁷. These classifications constituted the strata from which the statistically sound random sample was drawn (see tables 1 to 3). The choice of sample design and its size was dependent on the available financial resources and the required precision of the estimate at national and at sub-national level.

Figure 5: Regions and enumeration area boundaries (total and sampled(blue))



The tables below give a breakdown of the 207 EAs sampled in the study according to Region, Agro-Ecological Zone and Food Economy Zone.

⁷ Swaziland – Rural Development Area, Swaziland non-Rural Development Area, Individual Tenure Farm

Table 1: Size and allocation of the sample by administrative region

<i>Region</i>	<i>Total Number of Rural EAs</i>	<i>Number of EAs in sample</i>	<i>Number of households in the sample</i>
Hhohho	337	51	4,997
Manzini	340	51	4,484
Shiselweni	362	55	4,330
Lubombo	310	50	4,717
Swaziland	1,349	207	18,528

Table 2: Size and allocation of the sample by agro-ecological zone

<i>Agro-Ecological Zone</i>	<i>Total Number of Rural EAs</i>	<i>Number of EAs in sample</i>	<i>Number of households in the sample</i>
Highveld	402	62	5,241
Middleveld	504	74	6,790
Lowveld	342	56	4,978
Lubombo Plateau	101	15	1,519
Swaziland	1,349	207	18,528

Table 3: Size and allocation of the sample by food economy / livelihood zone

<i>Food Economy/Livelihood Zone</i>	<i>Total Number of Rural EAs</i>	<i>Number of EAs in sample</i>	<i>Number of Households in the sample</i>
Highveld Maize & Cattle	258	42	3,567
Timber Highlands	142	20	1,664
Urban Corridor	106	15	1,438
Middleveld Maize & Cattle	397	59	5,367
Lowveld Cattle & Cotton	77	12	917
Lowveld Cattle, Cotton & Maize	271	46	4,291
Lubombo Plateau	42	6	536
Lomahasha Trading & Arable	45	7	755
Unclassified ⁸	11	-	-
Swaziland	1,349	207	18,528

Survey organisation

An agreement was reached between the Swazi VAC and the Central Statistical Office (CSO) in the Ministry of Economic Planning and Development (MEPD) providing for the latter to carry out the data collection on behalf of the Swazi VAC. It was recognised that the CSO had significant experience in carrying out surveys and capturing data, as well as having the field capacity to conduct the VAC survey. With CSO as an integral member of the Swazi VAC, the collaboration process was straightforward.

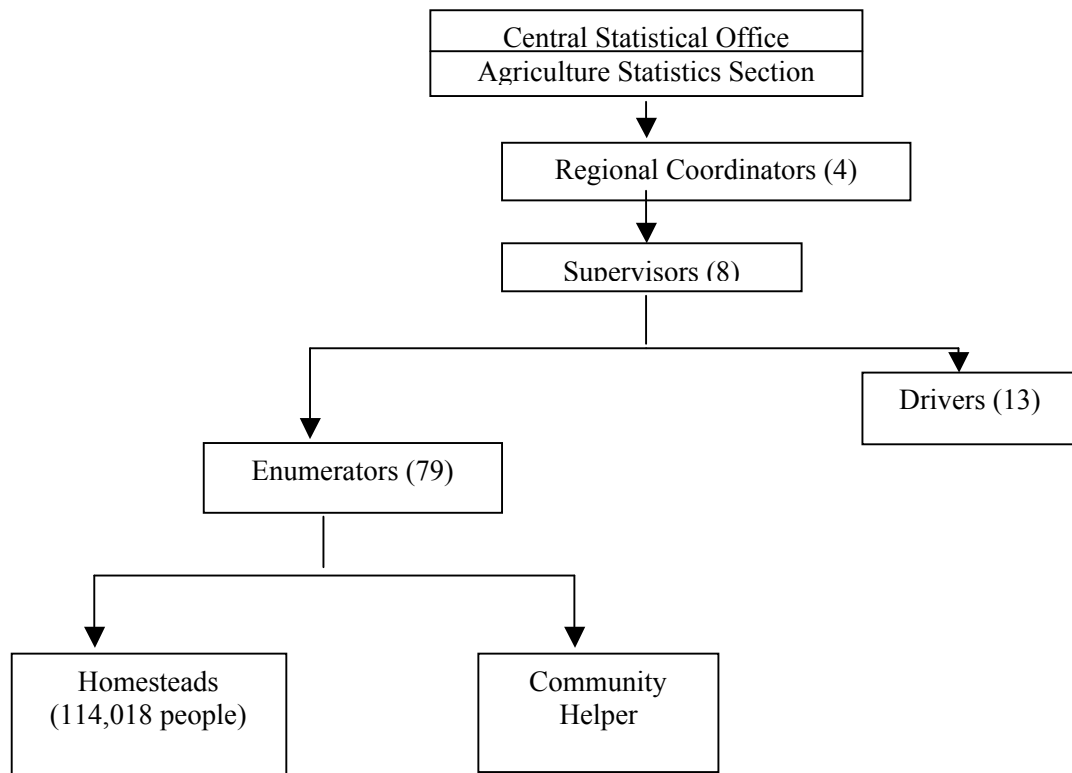
Prior to data collection, there was a training programme for the CSO enumerators and supervisors between the 25th and 31st May 2003. This took place in four locations, one per Region, lasting three days each. The content of the training sessions was fairly simple because the majority of enumerators were experienced questionnaire interviewers. The first day of training was spent familiarising the enumerators with the questionnaire focusing on sections three and four (death and livelihoods) because these subjects were fairly new to the

⁸ Unclassified: 11 rural EAs are not linked to any Food Economy Zone as they occur mostly in urban or peri-urban areas.

enumerators. The second day of training included mock interviews and on the third day a review of the mock interview exercise was held to discuss difficulties that were encountered and identify ways to overcome problems. The training was staggered so that the Acting Head of the Agricultural Statistics Section of the CSO could attend the first day of training in each Region. In addition, the Acting Head developed a manual to assist field staff during the fieldwork. The CSO staff contingent consisted of one National survey co-ordinator, four Regional co-ordinators, eight supervisors and seventy-nine enumerators.

In order to facilitate entry of enumerators into communities, contact was made in advance with the traditional leaders in areas included in the sample. The flowchart (Figure 6) depicts the organisational structure of the CSO data collection staff in the VAC survey. Data collection in the field lasted twenty-one days.

Figure 6: Fieldwork organisational chart



Data editing and data entry

The questionnaire was pre-coded precluding the need to code the completed returns from the field. However, checks were done to ensure the level of completion of questionnaires and where necessary and possible, an imputation process was used to account for missing information. Data entry was completed in two weeks. The computer package CS Pro 2.3 was used for data entry, cleaning and merging different files. Ox Edit software was also used to thoroughly edit and clean the data. The data was subsequently exported to SPSS to facilitate analysis. SPSSWIN 10.0, WesVar 4.2 and RR1.7.1 were used for data analysis.

Weighting process

Since this VAC demographic / livelihood survey was conducted in a sample of enumeration areas of the country, the data had to be weighted to provide an accurate reflection of the universe (total national number) of households residing in the rural areas of Swaziland. The

livelihood indicators survey utilised a single stage-sampling plan. The following procedure was utilised to weigh the data set:

Let N_h denote the total number of homesteads in stratum h, and N_{hi} denote the total number of homesteads in the enumeration area i that is in stratum h, using this information the sampling procedure in the h_{th} stratum ($h=1,2\dots H$) is shown in the following table:

Stage	Unit	Total EAs in stratum	Sampled EAs in stratum	Selection Probability	Weight (fhi)
1	Enumeration Area	Gh	gh	$\pi_{hi} = \frac{N_{hi}}{N_h} \times g_h$	$\frac{N_h}{(N_{hi} \times g_h)}$

The weight for a household is simply the inverse of the selection probability of the respective EA. This implies that an unbiased estimator of the h_{th} stratum total Y_h ($h=1,2\dots H$), obtained from the i_{th} first stage-sampling unit (FSU) ($i=1(1)\dots gh$) is:

$$y_h^* = \sum_{k=1}^{g_h} \sum_{j=1}^{N_{hi}} \left(\frac{N_h}{N_{hi} \times g_h} \right) \times y_{hij}$$

Legality and confidentiality

The survey was conducted by the CSO and completion of the questionnaires was a legal requirement according to the 1967 Statistics Act. This in all likelihood increased participation rates during the survey. The information collected from respondents is strictly confidential and only assigned members of the Swazi VAC are able to gain access to the information. All members of the Swazi VAC signed a data protocol document that prohibits use or dissemination of the information other than for the study itself. It is prohibited for the data set to leave Swaziland.

Data analysis

The wealth of data available from the study meant that it was essential to determine the analytical approach in order to make the most of the huge data set in a systematic manner. A series of meetings were held by the Swazi VAC to discuss analysis of the data. Technical support was provided by RVAC and UNAIDS at the beginning of the analysis. A tabulation plan was developed based on 57 proxy indicator variables to investigate the impact of HIV/AIDS and rural livelihood strategies (see Annex 2 for a complete list of proxy indicators developed during the initial tabulation phase). The output was a series of tables (several thousand) that required desk-study to identify trends and patterns. Various geographic and other breakdowns were used in the analysis, e.g., by Region, Food Economy / Livelihood Zone and Tinkhlunda as well as by socio-economic group. Additional tabulation requests were put to CSO regarding a variety of other matters. UNAIDS⁹ consultants led with the analysis of the impact of HIV/AIDS on demography and an independent consultant¹⁰ was engaged to analyse information on the impact of HIV/AIDS on livelihoods.

CONSTRAINTS AND LESSONS LEARNT

The size of the study and buy-in from interested parties as a result of the collaborative nature of the project means that the study results have significant credibility within Government, UN and NGO circles. However, the number of agencies involved both within Swaziland and regionally, in the development of the methodology and in particular the questionnaire, meant

⁹ Consultants were from the Human Sciences Research Council (HSRC) in Pretoria, South Africa

¹⁰ Neil Marsland

that the planned timeframe for the study was not realistic. The eventual study was many times larger than the study conceived at the beginning of 2003 particularly when considering the size and complexity of the data set and its potential for analysis. From a technical viewpoint, the considerable interest in the study resulted in a heavy focus on the construction of the questionnaire at an early stage of the study, rather than first clarifying the conceptual basis of the study, particularly the goal and objectives and identifying the data required. There was a need to more clearly link the objectives of the study, the data outputs and the tool used to develop those outputs. As new concepts for the study were developed through, a systematic revision of the conceptual basis of the study should have occurred.

Overall, the training of interviewers/enumerators was to an acceptable standard, but it could have been improved by the support of a trainer(s) with wider sectoral backgrounds that could explain a livelihood based approach. There were some difficulties explaining wealth ranking and other household economy / livelihood terminologies and approaches. This translated into isolated problems during data collection. The quality of a training programme prior to a field assessment should be of a high standard. It is also important that trainers have a clear idea of the objectives of the study and how the information that is collected will be analysed. In this way, potential problems and difficulties can be minimised before the analysis stage. Although the quality and validity of the data collected during the Swazi VAC survey is of a general high standard, some difficulties were experienced by a limited number of enumerators. For instance:

- Some of the enumerators had difficulty differentiating between wealth groups particularly because the criteria were not made clear enough in the training. The main criteria for ascertaining wealth status used in six Food Economy / Livelihood Zones (all except Timber Highlands and Lomahasha Trading and Arable) were the area of land cultivated and quantity and type of livestock owned by the household. In the other two Food Economy / Livelihood Zones, a more sophisticated approach including consideration of employment levels was used to differentiate between wealth groups.
- Defining chronic illness is always difficult and some enumerators agreed. A small minority of enumerators used slightly different definitions. Some defined it as bedridden for 3 months, others defined it as sick for 3 months but still mobile, a small minority included chronic illness that clearly came from other forms of ailment etc.
- Some enumerators confused the timeframe for death to have occurred within the family. A few enumerators recorded deaths in the household in the last few years when it should only have been the last year.

A more sophisticated computer set up in the CSO would have enabled a smoother process of data entry. The absence of a local area network within the CSO meant that the data was captured on a number of different computers and daily back-up had to be done using floppy disks.

The absence of any full-time staff working for the VAC in Swaziland proved to be an obstacle to finalise tasks. Members of the VAC Secretariat have permanent posts within their respective agencies or government ministries, with resultant delays in report production. Data analysis was inhibited by the part-time nature of all the participants in the study within the Swazi VAC and regional technical support from UNAIDS and RVAC.