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# Swaziland Assessment

**HIV/AIDS and household economy in a Highveld**

**Swaziland community**

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## Executive Summary

1. This study forms part of a four-country research programme funded by DfID. The overall goal is to develop methods of measuring and analysing poverty and modelling the impact of change at household level.

2. The aim of the Swaziland study was to test the use of individual household economy methods in an area of high HIV/AIDS prevalence; to identify the main factors affecting income levels in HIV affected and non affected households and to explore possible uses of household economy methods in programme design and monitoring.

3. The study was conducted in a Highveld, maize producing community, about 40 km from the capital city, Mbabane.

4. Household economy methods were used to describe and quantify the components of household income and expenditure, including food production and employment. The assessment covered the entire community.

5. Detailed demographic information was collected for all household members, including providers of remittance income. The presence of orphans<sup>1</sup> in a household was used as a proxy for HIV/AIDS<sup>2</sup>. 35% of all households fall into this HIV/AIDS affected category. Orphans make up 11% of the total population.

6. Comparisons were made between the income and standard of living of households across the study population. These were based on comparisons of disposable income i.e. income remaining after the household had met its food requirements. A minimum standard of living was established, including basic needs and primary school costs; the standard was designed to be consistent with international Millennium Development Goals (MDGs). 25 households (23%) fell below the minimum standard of living.

7. An estimate was made of the impact of HIV/AIDS, changes in agricultural production and other shocks on household economy and living standards.

8. Overall, total community disposable income appears to have fallen by around 8.3% due to HIV/AIDS, although the figure is higher in directly affected households. Agricultural production is characterised by low yields and low use of farm inputs. Low input use among wealthier households appears to be linked to variability of returns (due to climatic risks, pests etc). With the exception of retrenchment in the South African mining industry and loss of job security in local forestry work, the pattern of employment is relatively stable.

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<sup>1</sup> Orphans are defined locally (and in this study) as children who have lost one or both parents.

<sup>2</sup> The cause of death was not known definitively; however, adult HIV prevalence in this area is estimated at 38% so it is reasonable to assume that a large number of 'prime age' adult deaths resulting in orphans can be attributed to HIV/AIDS. 2001 figures for Swaziland show that 15% of all children who are orphans ( total = 59,000 in total, of which 35,000 (59%) have lost parents due to AIDS. These figures are projected to rise by 2010 to 22%, 87,000 and 82% respectively (UNICEF 2003, Africa's orphaned generations, New York).

9. Across the population as a whole, a higher proportion of poorer non HIV affected children are out of school than HIV affected children. This can be explained by selective targeting of orphans for assistance with school fees<sup>3</sup>.

10. Analysis of the characteristics of the poorest 25 households showed that 54% had either suffered a death within the last 5 years which was likely to be AIDS related and/or accepted an orphan from outside the household. Of the 10 households in this group that had suffered an AIDS death the simulation showed that at least 5 would previously have been in a much higher income group.

11. Irrespective of HIV status, households in the very poor group have less access to land, higher levels of unemployment and more low paid employment. However, across the group as a whole, there is no single 'cause' of poverty.

12. This study provides quantitative information that could be used to guide policy and to estimate the actual investment costs of raising living standards. Interventions that reduce household costs (e.g. school fees) and increase production (e.g. farm input subsidies) would help many poor households. However, the causes of poverty vary considerably, and individual case work is also needed to match assistance to household needs and capacities

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<sup>3</sup> Due to the current availability of targeted educational support for orphans, it is not possible to draw meaningful comparisons with enrolment rates of HIV affected children in other countries (eg 'Contrasting primary school outcomes of paternal and maternal orphans in Manicaland,Zimbabwe.' Nyamukapa C and Gregson S 2003)

# HIV/AIDS and household economy in a Highveld Swaziland community

## Part I

### 1. Introduction

1.1 This work was undertaken as part of a DfID funded programme of research on the theme: 'measuring and analysing poverty and food security.' The specific aims of the work in Swaziland were:

- (i) to refine and test the use of individual household economy methods as a means of understanding poverty and food security, in an area of high HIV/AIDS prevalence.
- (ii) to identify the main factors affecting income levels in HIV affected and non HIV affected households.
- (iii) to explore potential uses of household economy methods in programme design and monitoring, where the objectives are to reduce poverty and promote children's access to education, health and other developmental needs and rights.

1.2 The economic impact of HIV/AIDS has been the subject of much research and speculation since the early years of the epidemic.<sup>4</sup> Estimating the impact of HIV/AIDS presents two main problems.

1.3 The first problem relates to the fact that in much of Africa the epidemic of HIV/AIDS has developed during a period of rapid economic change. In the case of Swaziland, it coincides with a process of economic restructuring and liberalisation, which has (i) increased the cost of farm inputs (ii) much permanent direct employment has given way to labour subcontracting, with a loss of job security and a fall in income; (iii) jobs have been retrenched in South Africa. Additionally, over the past three years the area has been affected by drought. The economic impact of HIV/AIDS can be estimated only if these effects are disentangled from the effects of the epidemic.

1.4 The second problem involves the short-term effects of HIV/AIDS on household income, which in some cases can result in net gains as well as losses<sup>5</sup>. For

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<sup>4</sup> See, for example Barnett T, Effects of HIV/AIDS on farming systems and rural livelihoods in Uganda, Tanzania and Zambia (FAO 1994)

example, household income and standard of living does not necessarily fall following an AIDS related death, as the costs of the unemployed and underemployed may exceed the value of their income. A household may be able to adapt to the loss of an income earner, e.g. by changing its pattern of labour use, or by amalgamating with other households, leading to a change in its economic potential.

1.5 In principle, these difficulties of measuring the impact of HIV/AIDS on household economy can be overcome by using controlled longitudinal studies. However, there are extreme difficulties in establishing adequate controls in areas of high HIV prevalence, where the HIV status of most individuals is not known. Moreover, longitudinal studies are costly and technically demanding, and few attempts have been made to organise them.<sup>6</sup>

1.6 In this study, household economy methods, originally developed at SC UK for famine prediction<sup>7</sup>, have been used. These methods employ quantitative economic models, based on detailed descriptions of individual households, to simulate the impact of a change or 'shock' on the ability of households to achieve a defined standard of living. Potentially, this approach overcomes some of the practical difficulties of measuring and estimating the impact of HIV/AIDS<sup>8</sup>. The chief reason for applying these methods is to explore whether they can be used to generate information of direct operational value i.e. which allow the user insight into the relationship between HIV/AIDS and household economy in terms which lead to better programming decisions.

1.7 The main partner in this study, SC Swaziland, was particularly interested in possible interventions that would protect children from both immediate and long-term deprivation, including loss of access to education, adequate nutrition and other basic needs.

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<sup>5</sup> In the longer term the outcome is likely to be more variable. Logically an affected household might be 1. more vulnerable to other shocks (i.e. as their income would be less diversified) and continue to decline economically. 2. Might be able to adapt to changed circumstances e.g. if remaining household members found alternative employment. On the survey one household was found in which a bereaved woman had set up a clothing business and maintained household income. This will be taken up in a future paper.

<sup>6</sup> For example, Booysen, F Poverty dynamics and HIV/AIDS related morbidity and mortality in South Africa, Conference on 'Empirical evidence for the Demographic and Socio-Economic impacts of AIDS, University of Natal, March 2003: Yamano T and Jayne TS, 'Measuring the impacts of prime age adult death on rural households in Kenya', World Development September 2002

<sup>7</sup> See Annexe 1 (Household Economy approaches)

<sup>8</sup> Methodological questions are discussed in Annexe 1

1.8 In this first attempt to apply household methods to HIV/AIDS, the analysis has been conducted using retrospective information on mortality, covering approximately a 5 –year period. From the perspective of measurement a better design would be to conduct at least two surveys separated by an appropriate period<sup>9</sup>. As no information was available on HIV infection or specific causes of death, the study used the criterion of households in which deaths had occurred leaving dependent orphans, as a proxy for HIV. It seems likely that most of these deaths were HIV related as the age range in which most of these deaths occurred (chiefly young adults) is one in which non-HIV mortality is likely to be low. Although some of this mortality would have been non-HIV related, for brevity the term HIV/AIDS mortality has been used in the paper.

## **2. Background and context**

2.1 Swaziland is the second smallest country in Africa (17,364 sq. km). Nevertheless, it has a wide variety of geographic features and four distinct agro-ecological zones.<sup>10</sup> Swaziland's economy grew rapidly during the 1980s, due mainly to foreign direct investment (FDI) during the period of international sanctions against South Africa. FDI fell rapidly in the 1990s resulting in a steady increase in unemployment and growing budget deficits (UN Common Country Assessment, 1997). By 2002 the average unemployment rate was around 40% and the budget deficit around 5.5% GDP (FAO 2002). The rise in unemployment has also been affected by a fall in migrant labour opportunities, particularly in the South African mining sector. Thus, by 2001, the quota of mining jobs available for Swazis had fallen from 11,500 in 1997 to 650 in 2001 (FAO 2001).<sup>11</sup>

2.2 In 1996, the government of Swaziland produced an Economic and Social Reform Agenda (ESRA), and a programme of economic liberalisation was introduced in 1997. Among the policy measures implemented in the late 1990s, the removal of agricultural input subsidies is probably the most relevant to the present study. Following the removal of fertiliser subsidies in 1999, national fertiliser use in non-commercial crop production fell from around 16,000 tonnes (the figure for 1998/9), to 12,700 tonnes in 2000/1 (FAO 2002). Use of hybrid maize seeds also fell

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<sup>9</sup> This will be discussed further in a separate paper on methodology.

<sup>10</sup> The Highveld, Middleveld, Lowveld, and Lumbombo Plateau

<sup>11</sup> According to a recent UNDP poverty assessment 66% of Swazis live in absolute poverty and in some rural areas, poverty is as high as 80%. There is also a widening gap in the distribution of income, with

substantially, from 4,000 tonnes in 1995/6 to 1,153 tonnes in 2001/2. Prior to ESRA, seeds were provided free to farmers by government, but are now supplied at market prices, through the private sector and co-operative societies (FAO 2003).

2.3 Swaziland's currency, the Lilangeni, is pegged to the South African Rand. During FY 2001/2, its value fell by over 38% against the dollar. In January 2002 the Lilangeni fell to a low of US\$1=Elangeni (E) 11.6. Average inflation in 2001 was 7.5% (FAO 2002).

### **3. The study community 'Hhohho I' <sup>12</sup>**

3.1 The study was carried out in a rural community in Hhohho province, which is situated in the Highveld region of Swaziland. According to a recent survey Hhohho province has an adult HIV prevalence rate of 36.7% (Anti natal clinics survey 2002). This is one of the highest rates recorded globally, although slightly lower than the Swazi national average (38.6%).<sup>13</sup>

3.2 The study site was selected by SC Swaziland, which works with the Orphans and Vulnerable Children (OVC) committee. This committee was set up to assist children, including those in households affected by HIV/AIDS.

#### *3.3 Geographical Location*

3.3.1 Hhohho I is situated in the North West of Swaziland, near the border with South Africa in the Highveld agro-ecological region. It is administratively within the Hhohho region and is 35-40 km. from Mbabane, the capital city.

3.3.2 The area is hilly and lies at an altitude of 900 to 1,400 metres, with patches of arable land and rocky portions. The tops of the hills are covered by commercially managed forestry land (Pinus species), owned by SAPPI <sup>14</sup>the largest paper pulping company in southern Africa. The slopes include outcrops of wattle, owned by individual homesteads.

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10% of Swazis holding 60% of national income, and 90% holding the remaining 40%. ([www.wv.org.za/countries/Swaziland](http://www.wv.org.za/countries/Swaziland))

<sup>12</sup> Based on information provided by Henry Narangui. Hhohho I is an assumed name

<sup>13</sup> HIV prevalence is highest in the town of Manzini (41.2%)

<sup>14</sup> South African Paper and Pulp Industry

3.3.3 The area is characterised by very cold temperatures particularly in the months of July to August (the winter season). The area receives an average rainfall of about 700-1200 mm per annum.

#### *3.4 Demography and Pattern of Settlement*

3.4.1 The study area has around 120 homesteads, although not all homesteads are permanent residences<sup>15</sup>. The land available to each household for cultivation, grazing and/or forestry occupies about 0.5 – 5 Ha. As homesteads are on or close to cultivable land the pattern of settlement is very dispersed and the community covers a large area (approximately 3km by 3km).

3.4.2 Many rural households in this area include three generations of family members. Typically, grandparents maintain the homestead, while young adults (male and female) work outside the community, either in South Africa, or in other parts of Swaziland.

3.4.3 Orphans were defined by the OVC committee to include children who have lost one or both parents. Vulnerable children include children whose parents are incapacitated.

3.4.4 In common with other Swazi communities, household demography in the study area has been affected by excess mortality, chiefly in the 25-50 year age range. In households where parents in this 'middle generation' die, children generally remain with their grandparents. Grandparent headed households may also take in orphaned grandchildren whose families had left the community.<sup>16</sup> Remittances may still be received from other members of the extended household. Orphaned children without grandparents either remain on their parents' land in child/adolescent headed households or (it is assumed) the household disintegrates. Very little is known about the fate of children in these circumstances.

#### *3.5 Land Tenure and Inheritance*

3.5.1 Hhohho I is sited in an area of Swazi National Land (SNL). The local Chief is responsible for the allocation of land to both residents and migrants from other

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<sup>15</sup> Non resident households generally have salaried work and only visit periodically.

<sup>16</sup> Source: OVC committee key informants.

regions of the Kingdom. Population increase and migration from other areas are reported to have led to a steady reduction in the size of homesteads over the past 50 years.

3.5.2 Traditionally, land is not transferable without approval by the Chief. However, land can be passed on from parents to their descendants and in cases where children are orphaned, the traditional system allows relatives to 'take care' of the land. The elder relative has the role of overseeing any redistribution, and should ensure official approval by the Master of the High Court. However, this process is not widely understood or adhered to.

3.5.3 Traditional systems allow widows to inherit their husband's land. The traditional system protects the orphans and should ensure that they inherit their parents' land. Girls are allowed to inherit land and can marry and settle on their parents' land. However, if a household has no sons, and girls move to their husband's land, relatives can re-distribute the property among themselves after approval by the Master of the High Court.

3.5.4 In Hhohho I, the Chief has allocated about 2-3 hectares to the Orphans and Vulnerable Children (OVC) Committee (part of 'NERCHA', a national HIV/AIDS project), to use for crop production to feed the orphans. However, the allocated land has not been used. We understand that this was due to lack of money for fencing and other agricultural inputs (fertilisers, lime, hire of tractor for ploughing, etc).

### *3.6 Infrastructure (roads, telecommunications, electricity)*

3.6.1 The area has a good road network of both tarmac and well-maintained murrum roads and a twice-daily bus service to Mbabane. However, there are no electricity connections in the community. Cellphone network coverage is patchy.

### *3.7 Access to Social Services (education, water, health)*

3.7.1 There is one primary school in the community and two primary schools at a distance of about 10-15 km. Some students (mainly in secondary schools) access education in South Africa. Save the Children Swaziland is sponsoring education (primary and secondary) for about 45 orphans in Hhohho I. where it is providing

school fees and clothing for children affected by HIV/AIDS<sup>17</sup>. Further assistance with school fees is currently available for orphans through government and donor schemes.

3.7.2 There is only one public health clinic, also about 10-15 km away and residents tend to use the better facilities in Mbabane. The settlement has three traditional healers, two of whom practice mostly in South Africa.

3.7.3 Water is chiefly obtained from seasonal or permanent streams although a few households have gravity fed piped water (using plastic hosepipe) from hill springs to homesteads.

### *3.8 Main sources of food and cash income*

3.8.1 Maize, livestock (mostly cattle and poultry) and forest production are the main sources of agricultural income. Maize cultivation is highly dependent on fertiliser, pesticides and other inputs. The soils are acidic, hence lime is critical for maize cultivation. Animal manure is used to replace chemical fertiliser to some extent although the accumulation of animal manure is limited by free range grazing practices.

3.8.2 Land preparation and crop processing are largely mechanised (using Government and privately hired machinery), although poorer households, working smaller plots, do use hand labour. Herbicides are used for weed control, and weeding itself is sometimes mechanised. This means that there is very little agricultural employment in the village as most agricultural work is carried out by family labour.

3.8.3 People from this community are employed in a wide range of occupations, including self-employed trades and salaried work in Swaziland and in South Africa. Income sources are described in greater detail in section 7.2.

3.8.4 In recent years income has been lost due to HIV/AIDS mortality, retrenchment of jobs, particularly in mining in South Africa and from the restructuring in the Swazi forestry sector. According to our survey information, 5 households currently gain

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<sup>17</sup> Through funding from Bristol Myers Squibb.

income from South African mining remittances. However, a further 6 households have recently lost mining income due to retrenchment and two have lost income through the death of an employed miner.<sup>18</sup>

3.8.5 Restructuring by SAPPI, the company controlling local forestry land, in 2000/2001, was also reported to have resulted in substantial job losses. SAPPI now contracts out all forestry work (fire fighting, felling, planting, forest maintenance etc).<sup>19</sup>

#### **4. Field work: Assessment methods**

4.1 The study site was selected in consultation with SC Swaziland, who also provided background information on the population and the economy of Hhohho district. This included recent reports of the National Vulnerability Assessment Committee (VAC).

4.2 SC Swaziland is well known in the selected community and prior to the field work, a member of the SC Swaziland programme team visited community leaders to explain the purpose of the work, and hold preliminary meetings with the OVC committee. Orphans were identified by the OVC committee in liaison with the Chief and the Inner Council.

4.3 The main field work was carried out over a period of 18 days (2-20 August 2003). An additional 8 days' field work was undertaken by two team members to gather more detailed demographic, employment and agricultural information. The Swazi team included three members of the national Vulnerability Assessment Committee (VAC), who had some prior experience of household economy approaches and two experienced community level workers. The assistant team leader had extensive experience of standard Household Economy Analysis (HEA) methodology and had also been involved in pilot assessments in Kenya, using the new individual household methods. The Food Security and Livelihoods Unit (FLSU) London provided training and overall direction.

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<sup>18</sup> Key informant information suggests that ten years ago up to 40 households in the community received mining remittances.

<sup>19</sup> Survey data indicates that prior to restructuring, around 18 people from Hhohho I were employed by SAPPI. Of this total, 1 has stopped working due to ill health, four continued to work full time, eight were only working part time and five had been retrenched. Loss of income from forestry work was cited by a number of informants as a cause for lower input purchases.

4.4 The fieldwork was conducted in two stages. The first stage was to obtain as complete as possible an overview of the economy from the secondary literature; farmers (men and women from different economic groups); traders; the local agricultural extension worker; and other key informants. This overview was then used to inform the more detailed information collection from individual households.

### *Stage 1*

The information collected included:

(i) A comprehensive list of all crops (including minor crops, fruit trees, timber, fodder, vegetables etc) and all livestock and their uses (traction, milk, meat, live sale and sale of products).

(ii) For each agricultural activity information was recorded on:

- Seasonal agricultural labour requirements (crops and livestock) i.e. a labour calendar, identifying the labour inputs for a defined area of land, for each task (e.g. land preparation), and who (men/women/children) typically does this work.
- The costs of all crop and livestock inputs (land, labour, fertilisers and pesticides, veterinary services etc); the yields expected at different input levels; and details of seasonal prices.

(iii) All types of employment. For each type of paid employment (including salaried and self-employment) information was obtained on the amount of labour typically available for each type of employment (days per month), seasonal variation in this, wage rates, and the requirements (age, gender, skill or qualification) for employment.

(iv) Market information was collected, including the names and locations of local markets for goods and services. Information on the operation of markets, e.g. price setting, for major traded commodities.

(v) Information was collected on credit, loans and local farm input support schemes.<sup>20</sup>

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<sup>20</sup> The 'Chinese Scheme', a development co-operation programme with the Governments of China and Swaziland, has enabled a small number of farmers in the settlement (currently 3) to maximise maize production. The scheme provides a credit for agricultural inputs. Inputs per Ha include: Fertiliser 23238

(vi) Enquiries were made into the social and economic context. To gain further understanding of wider issues affecting household economy, including the impact of HIV/AIDS, interviews were conducted with members of the OVC committee. These focussed on questions of land tenure and inheritance e.g. who in the extended family is normally considered responsible for supporting orphans, the availability of external NGO and government support etc. A list of children receiving support from SC Swaziland via the OVC committee was provided. Other changes, including a loss of employment opportunities and the impact of privatisation and retrenchment in the commercial and government sector were also discussed with key informants

(vii) A map of the community, marking each homestead and the name of the household head was drawn up to assist in the location of households and to ensure that all households were visited.

(viii) A group of key informants, (knowledgeable men and women from the community) defined the characteristics of wealth groups and estimated of the proportion of households falling into each group.

## *Stage 2*

4.4.2. The second part of the field work involved individual household interviews.

Questionnaires were designed on the basis of information obtained in the first stage, and in close consultation with the Swazi team, to ensure that information was gained in a way that was acceptable to respondents. Two samples of households were drawn for individual household interviews: one for long interviews, in which very detailed household budgets were obtained, and one for short interviews.

*Long interviews.* Households were selected for long interviews in proportion to the wealth distribution obtained from key informant estimates. Long interviews (which typically take about 2 hours) used standard semi-structured interview techniques<sup>21</sup>, to obtain a detailed account of land holding and cultivated land, household membership,

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type (3 x 50 kg); lime (2 tonnes); maize seeds (10 kg) and top-dressing, (lime ammonium nitrate – 2 x 50 kg). After harvest the farmer pays back 22 x 70 kg bags of maize. The Scheme also provides a shelling machine without charge. The area extension worker identifies farmers with the capacity to produce and pay back the required maize. In the past a local Co-operative group made up of local farmers supported maize production and marketing. However, this collapsed due to poor management.

<sup>21</sup> The Household Economy Approach, (Seaman J et al SCF UK 2000)

changes in household membership in the past 3 years, a household budget (food and cash income and expenditure) and assets (land, livestock holding and items such as bicycles).

*Short interviews.* A short questionnaire was designed after the long interviews were completed (which took approximately 25 minutes). This covered a basic set of questions, required to obtain a reliable estimate of all household income sources, land ownership and use, demography and other relevant information. The short interviews did not cover household expenditure. Every household not included in the long interviews was visited, in an attempt to obtain a complete enumeration of the community. If homesteads were empty, two further visits were made. As already noted, a further round of short interviews was conducted to cover households which were empty on the first visit and to obtain more detail on demography (specifically on relationships within the household) and on the use of agricultural inputs.

4.4.3 Information in both the long and short interviews was collected with reference to the period October 2001-September 2002, the most recent complete agricultural year.

4.4.4 No attempt was made to estimate household assets and savings, other than livestock holdings and land. Better-off households may be assumed to have savings (held in a Bank or Building Society) and the very poorest households none. It was not felt to be appropriate to discuss this on a short visit to the household.

4.4.5 A total of 113 households (20 long and 93 short interviews) were included in the analysis. Five incomplete interviews were discarded. No interviews were carried out for twenty households where after 3 attempts, no one could be found<sup>22</sup>.

## **5. The analytic approach**

5.1 The overall aim of the analysis was to identify the main factors affecting income levels in HIV affected and non-affected households. The first stage in the analysis was to rank households according to their current disposable income and to identify households falling beneath a defined standard of living. Further analysis could then be carried out, using modelling techniques described in section 6. These techniques

were used to simulate changes in household disposable income, resulting from HIV/AIDS or other deaths; reduced agricultural output etc.

## *5.2 Definitions and terms*

5.2.1 In order to make meaningful comparisons between the income and standard of living of different households, food and non-food income must be reduced to common terms. There is no completely satisfactory way of doing this. The households included in the study obtain part of their income as food produced for consumption and part in cash (from the sale of food and non-food crops, employment, remittances and gifts<sup>23</sup>). Converting all income to its money equivalent runs into the difficulty that some items of food produced (milk and some fruit production) could not be sold in the volumes in which they are produced. Conversion of income to food energy (kilocalories (kcal)) is also inexact as the quality (i.e. nutrient content) of food produced for consumption varies between households.

5.2.2 Additionally, the primary interest of the study is not in gross household income but in household standard of living. The expenditure of each household required to meet a defined standard of living is unique to that household. The household information has therefore been organised in the following way:

## *5.3 Disposable income*

1. The results of the analysis have been presented in terms of household disposable income, defined as the money remaining to the household after their minimum food needs have been met.

2. The minimum household food need is calculated as the sum of the food energy requirement of each household member. The requirement estimates used are those given by WHO (1995) by age and sex for a population of a developing country. As many households produce less food than they consume, any household food needs not met by household production is met by the purchase of maize at the price prevailing in the study period (E2/Kg): the cost of any maize purchase is subtracted

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<sup>22</sup> According to key informants, around 6 of the empty homesteads were only used periodically, and belonged to wealthier householders whose permanent residence was in town

from the household's money income. For example, a household with a requirement of 1000kg maize/ year to meet its consumption needs, which cultivated 400kg maize/ year for consumption, and had a cash income of E2,000/ year from employment would be calculated to have a disposable income of: (E2,000 - (cost of 600kg maize, i.e. E1200)) = E800/year.

#### *5.4 'Adult equivalents'.*

5.4.1 To ensure the comparability of disposable income between households, results have been standardised in terms of 'adult equivalents'. The number of adult equivalents = the total annual household food energy requirement / average (male and female) annual adult energy requirement.

#### *5.5 The standard of living.*

5.5.1 A minimum standard of living has been defined as the ability of a household to meet:

- basic household expenses i.e. kerosene/candles/, matches, and household utensils and blankets.
- personal expenses i.e. clothing, soap and medical costs.
- primary school costs i.e. school fees, uniforms and books.

The cost of farm inputs has not been included, as this separately identified in the analysis.

5.5.2 The cost of these items is based on the costs reported in the long interviews. Basic household costs were calculated at E466; personal expenses at E108 and primary school costs at E470/ child. Taxation has been excluded as in practice only employed individuals pay this.

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<sup>23</sup> 'Gifts' include all transfers between households and to households on 'non-market' terms. This would include charitable gifts, gifts between kin, reciprocal arrangements between households, food aid etc.

5.5.3 As demographic composition varies between households, the cost has been calculated for each household separately as: household costs + (personal expenses \* number of people in household) + (number of primary school age children \* cost child). Primary school age has been taken as 7 years to 14 years of age.

5.5.4 This approach approximates the efficiencies which larger households may enjoy in the consumption of some items (e.g. a larger household is likely to spend less / person on fuel for household lighting and utensils) and the higher cost associated with personal expenditure and school fees in larger households.

5.5.5 Comparisons between households are therefore in reasonably common terms. Minor approximations aside, the only specific omission is the difference in the food quality (nutrient composition) of food grown by each household for its own consumption. As maize accounted for almost all production for domestic consumption in the reference year this difference is likely to be small.

## **6. The model**

6.1 The technique used was to simulate the impact on disposable income and standard of living, of changes occurring within a household or external to it. The aim was to disentangle the effects of HIV/AIDS and other changes in the economic context. Changes within the household include loss of income due to the death of a household member; changes external to the household include factors such as an increase in agricultural input prices, or a drop in crop production/ unit area.

6.2 The simulation is a simple arithmetic calculation of the impact of a stated change (in demographic composition, production etc) on household disposable income. The aim is to ensure that the calculations that are being made and the assumptions on which these are based, are clear to the user.

6.3 A very simple example would be the estimated change in disposable income that would result from an increase in maize production. For a household of 2 members

- with an annual food energy requirement equivalent to 400kg maize.
- maize production of 600 kg using agricultural inputs costing E500.
- an employment income of E 2000

- at a maize price of E2/Kg, would be as follows:

The calculated household disposable income would be E2400 i.e. (the value of maize surplus to consumption, (200kg @ E2)) + employment income of E 2,000 = E2400.

If production increased by 200Kg to 800Kg, disposable income would rise by E400 i.e. the value of the additional maize, to 2,800.

Multiple simultaneous changes e.g. a change in employment income, household costs, input costs and returns, can be calculated using exactly the same method.

Although the calculations are simple, their application to large numbers of households is difficult and software was written to facilitate the analysis <sup>24</sup>

## **Part II**

### ***Findings and analysis***

The findings are presented in three sections. Section 7 describes the population and economy of the study community. Section 8 models (i) the direct impact of identified HIV/AIDS mortality on household disposable income and living standards and (ii) the impact of changes in agricultural input prices and drought on household income.

Note that in the figures households are shown in ascending order of disposable income except where otherwise indicated.

## **7. Overview of results: Population, sources of income and living standards**

### ***7.1 Population***

7.1.1 Figure 1 shows the recorded population, grouped by one-year divisions from birth to 80 years of age, and all ages above 79 years. A summary is given in Table 1. For each sex the population has been divided into three groups: Resident, Orphans and Visitors.

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<sup>24</sup> In principle it would be possible to use a spreadsheet for the entire analysis, although the large number of categories and subcategories e.g. of income sources, makes this difficult. The software written is based on an access database and was used to conduct the basic calculations and sorting operations e.g. of households by disposable income. These intermediate results were exported to a spreadsheet for further analysis.

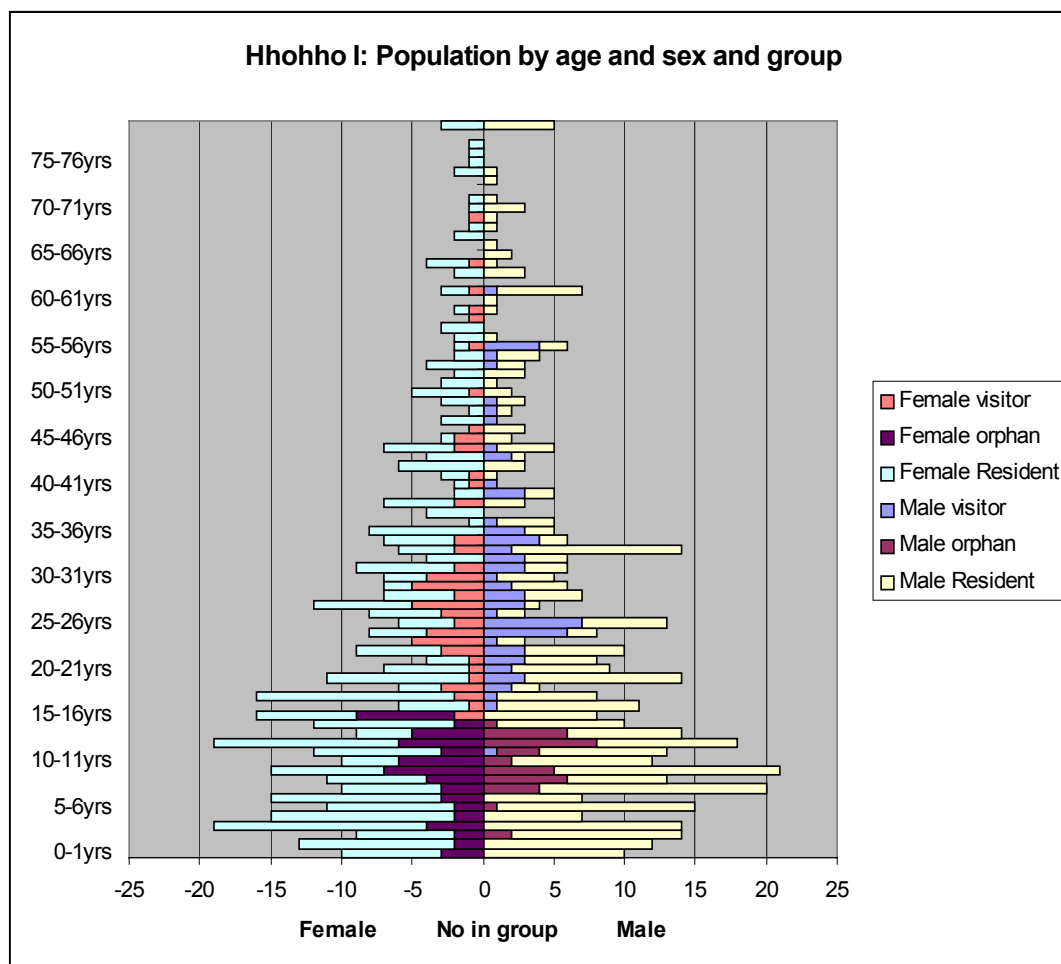


Figure 1. Population by age, sex and group. Ages by 1-year intervals and over 79 years of age.

Table 1 Population Categories

	Male	Female	Total
<b>Resident</b>	333	328	661
<b>Orphans</b>	38	61	99
<b>Visitors</b>	73	66	139
		<b>Total:</b>	899

- (i) Residents: people who live (i.e. sleep) in the community.
- (ii) Orphans, as defined by the village OVC committee i.e. children under the age of 17 years who may have lost one or both parents. Ninety-nine orphans were identified, 61 female and 38 male. Orphans make up 11% of the entire population of the community and 24% of all children under 17years.<sup>25</sup>

<sup>25</sup> 23% of orphans have lost their mother, 59% have lost their father and 18% have lost both parents

- (iii) Visitors: People who are part of the core household economy (i.e. they contribute to this) but who visit the household for only a short time each year (e.g. at weekends, or every few months). This group is made up mostly of younger adults who are working, or seeking work at a distance (typically in Mbabane, Manzini and other parts of Swaziland and South Africa) and some school children at residential schools.

In calculating the disposable income of each household the expenses of visitors have been calculated in proportion to the time which they spend at the household (ranging from a few days each year to every weekend).

7.1.2 Eighty-nine of the 99 orphans identified were members of the household in which they are currently residing, at the time of their parent's death. Ten orphans entered the community to join a household following the death of an adult living elsewhere. Girl orphans outnumber boy orphans by approximately 2:1.<sup>26</sup>

## *7.2 Sources and levels of household income*

7.2.1 Figure 2, shows the total (i.e. not disposable) income per adult equivalent by source for each household. Food produced for consumption has been converted to its equivalent cash value (although as noted not all of this food could in fact be sold). Food makes up the larger part of the income of the poorest households, a proportion that declines with increasing wealth. Larger incomes are derived chiefly from employment. Table 2 shows the types of employment in 4 categories and Figure 3 shows amount of employment income by employment type and household.

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<sup>26</sup> This observation is consistent with other studies and anecdotal evidence. The question 'what happens to boys?' requires further rigorous investigation. The assumption is that many leave their communities prematurely and migrate to urban areas.

Table 2: Types of employment by category

<b>Employed, private sector</b>	<b>Employed, casual</b>	<b>Self-employed/ petty trade</b>	<b>Government employment</b>
Driver	Agricultural labour	Dressmaker	Heath worker
Company employee	Tree/wattle cutter/feller	Carpenter	Road grader
Panel beater	Casual labour/ gardening	Sale fruit and vegetables	Assistant primary teacher
Casino employee	Mudding houses	Construction	
Bus conductor	Grass sales	Sale charcoal	
Mechanic		Sale meat	
Messenger		Sale clothing	
Cook,		Tailor	
Purchasing officer		Grocer	
Miner		Traditional healer	
Driver, high		Beer brewing	
Sales assistant		Chicken sales	
Junior Clerk		Sale biscuits/ fat cakes	
Police officer		Mat/basket/broom/ rope production	
Secretary		Street hawker	
Fireman,		Builder	
Forestry labour			
Guard watchman			
Maid			
Cleaner			

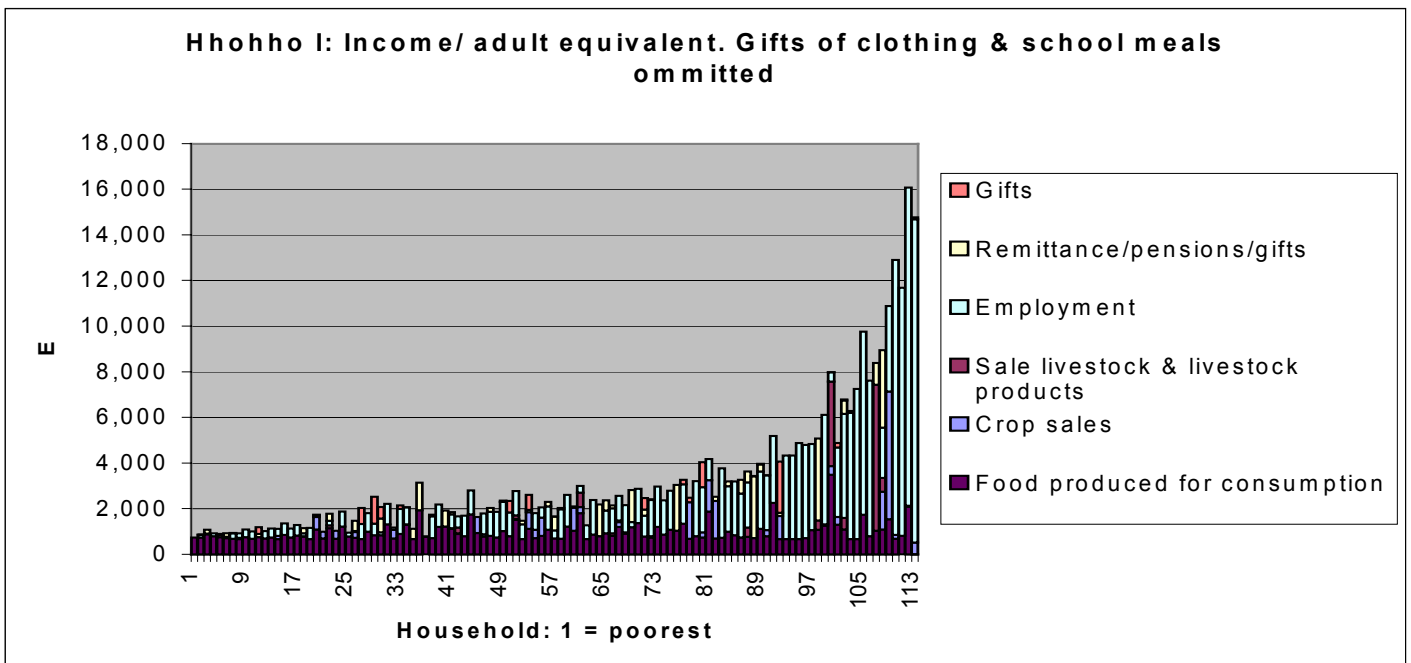


Figure 2. Sources and amount of income/ adult equivalent/ household (E), excluding gifts of clothing and school meals. In order of disposable income.

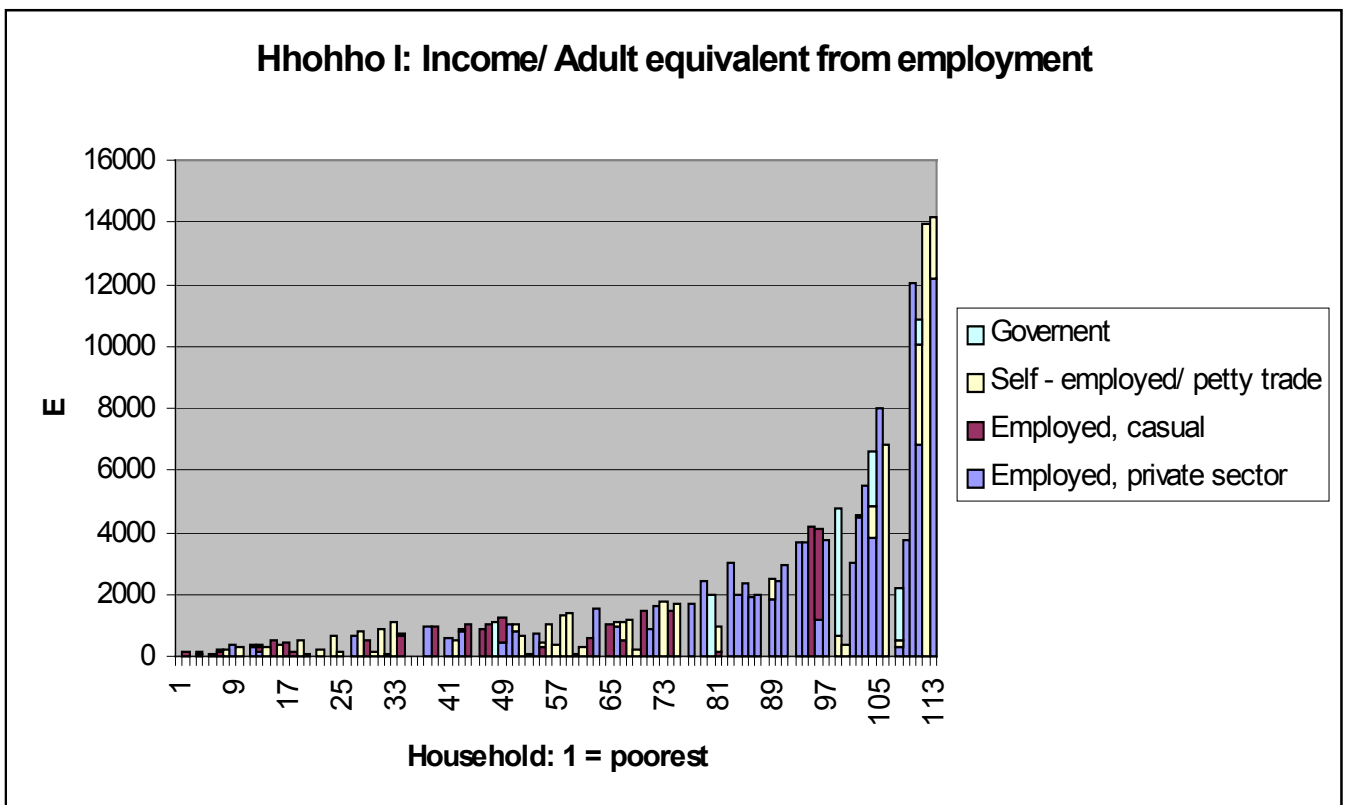


Figure 3. Employment income (E) by household, in order of disposable income.

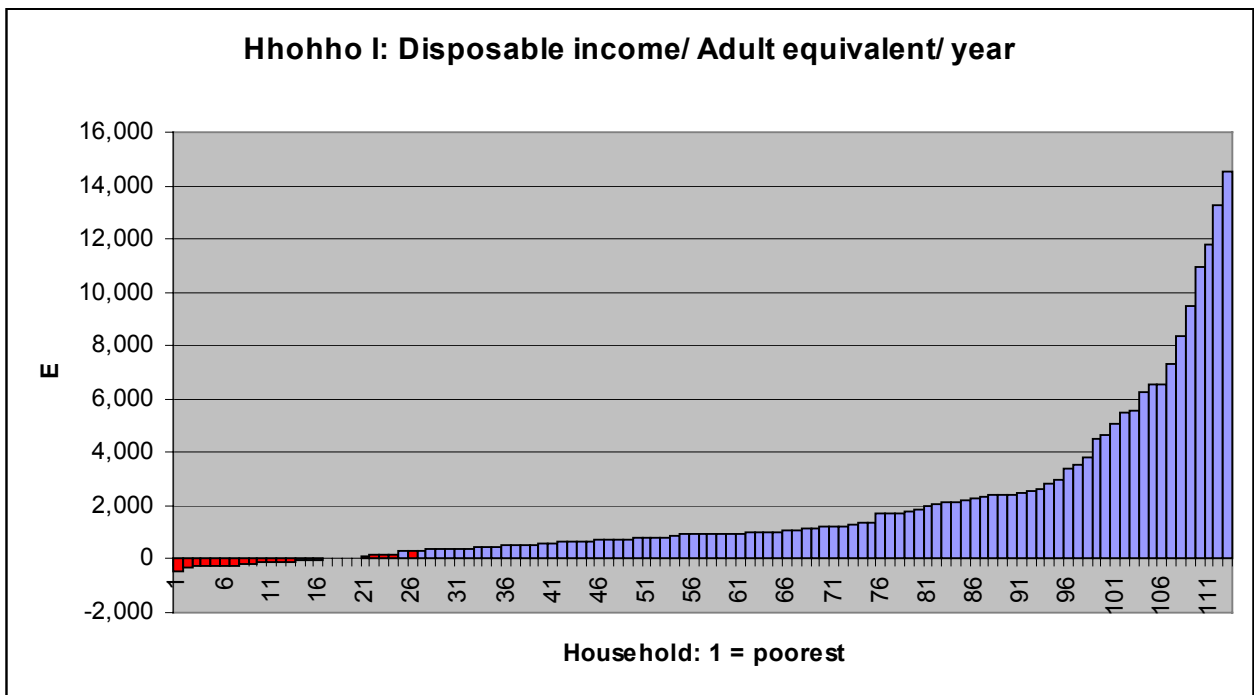


Figure 4. Disposable income/ Adult Equivalent by household, in order of disposable income. Households in red fall below the defined poverty threshold.

### 7.3 Disposable income and the standard of living

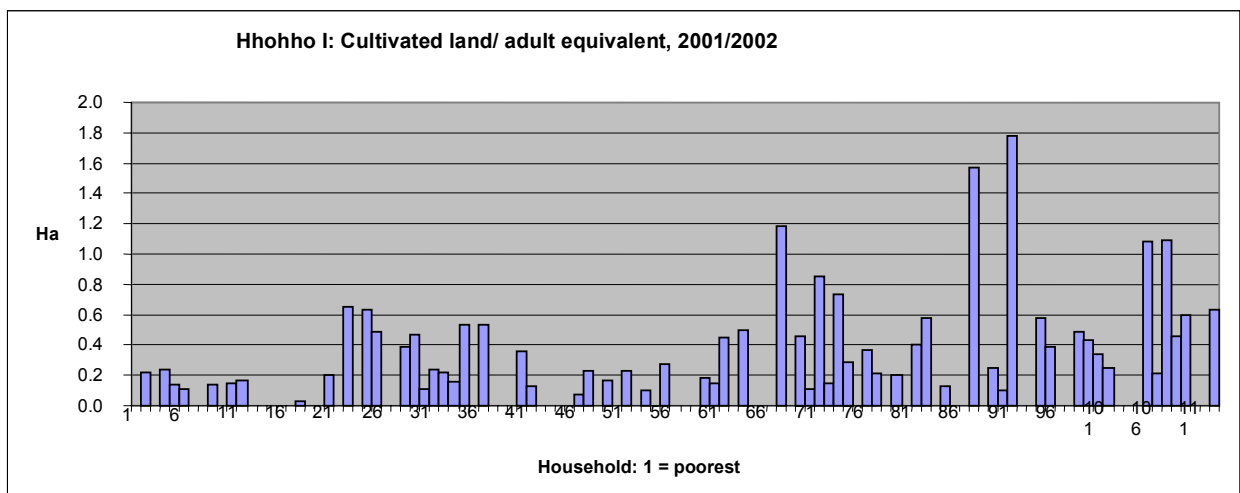
7.3.1 Figure 4 shows the disposable income per adult equivalent by household, i.e. cash remaining after household food costs have been met (see para 5.3) in ascending order of disposable income. Households that fall below the defined minimum standard of living are shown in red (para 5.5). Note that the method used to calculate household costs (para 5.5.3) means that a household with a higher income per adult equivalent may have less disposable income (e.g. they may have many school age children and greater school costs) and a lower standard of living than a household with a lower disposable income. Twenty-five households (22% of households) fall below the defined poverty threshold.

7.3.2 Several of the poorest households are shown with a negative disposable income. This is to say that in the reference year, the recorded household food and cash income is insufficient to meet the household's food needs. All of these households were observed to be very poor. The explanation is likely to include (i) some under-reporting of small income sources, particularly charitable gifts; (ii) a lower actual level of food consumption than was allocated in the analysis (para 5.3); (iii) in cases where income was well below minimum consumption and there had been a recent shock to the household (e.g. due to retrenchment or ill health), the households may be using savings and other capital to survive.

7.3.3 From Figure 4 it can be seen that disposable income is very unequally distributed, ranging from less than zero to E 14,529 / adult equivalent (i.e. approximately US\$1,200 / adult equivalent). At the highest income level a household is likely to own a tractor or pickup, use bottled gas for fuel, pay for children in secondary education etc: at the lowest a household is effectively destitute.

7.3.4 A greater disposable income is associated with larger landholdings and a smaller number of people in the household (expressed as adult equivalents), although in both cases the correlation is weak ( $R^2 = 0.05, 0.04$  respectively) (Figures 5-7.) The dependency ratio, calculated as the ratio of the number of people over 16 years of age: number under 16 years age (Figure 8) in the household, shows little obvious relationship with wealth. The visitor population was included in the dependency ratio. Omitting this makes little difference to the trend as does using different ages as the basis for calculation. Older people were omitted as some of these have (in some cases substantial) pension income: the numbers are anyway too small to influence the outcome.

Fig 5 Land cultivated/adult equivalent 2001/2002



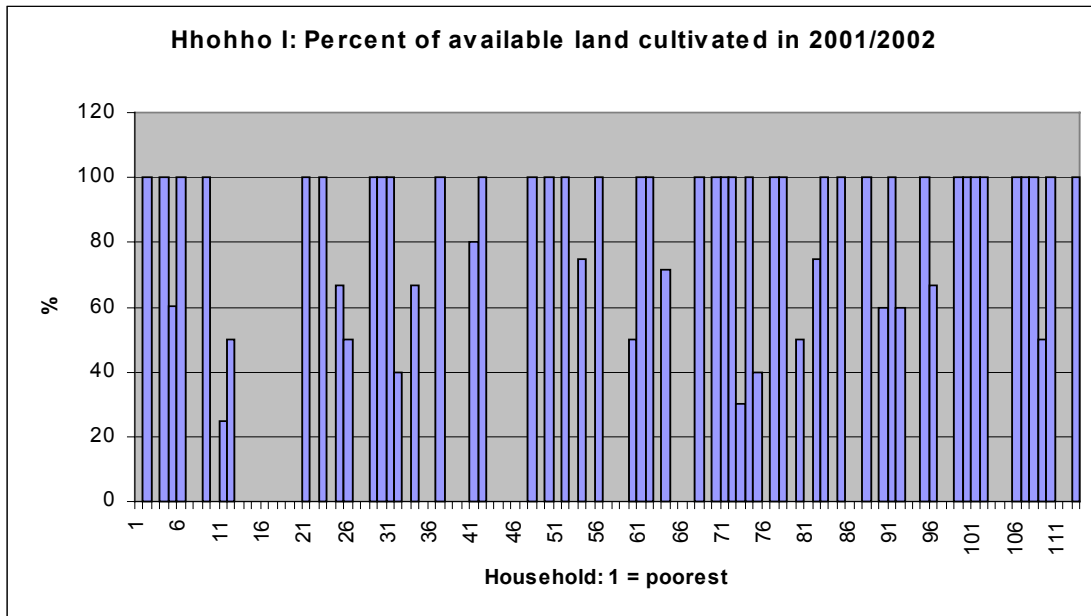


Fig 6 Percent of available land cultivated in 2001/2002, by household

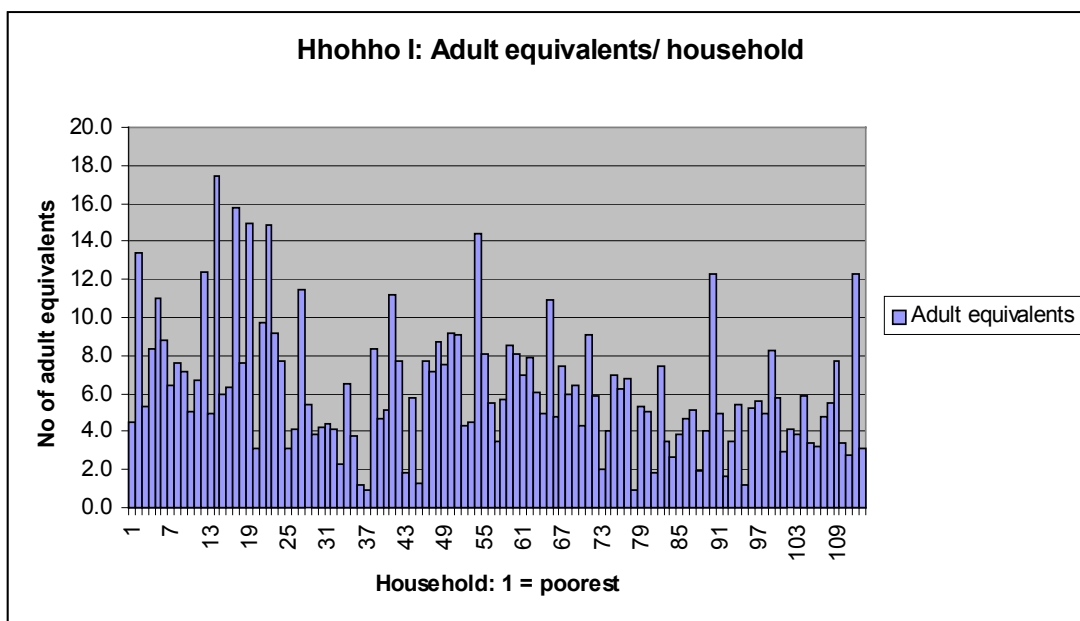
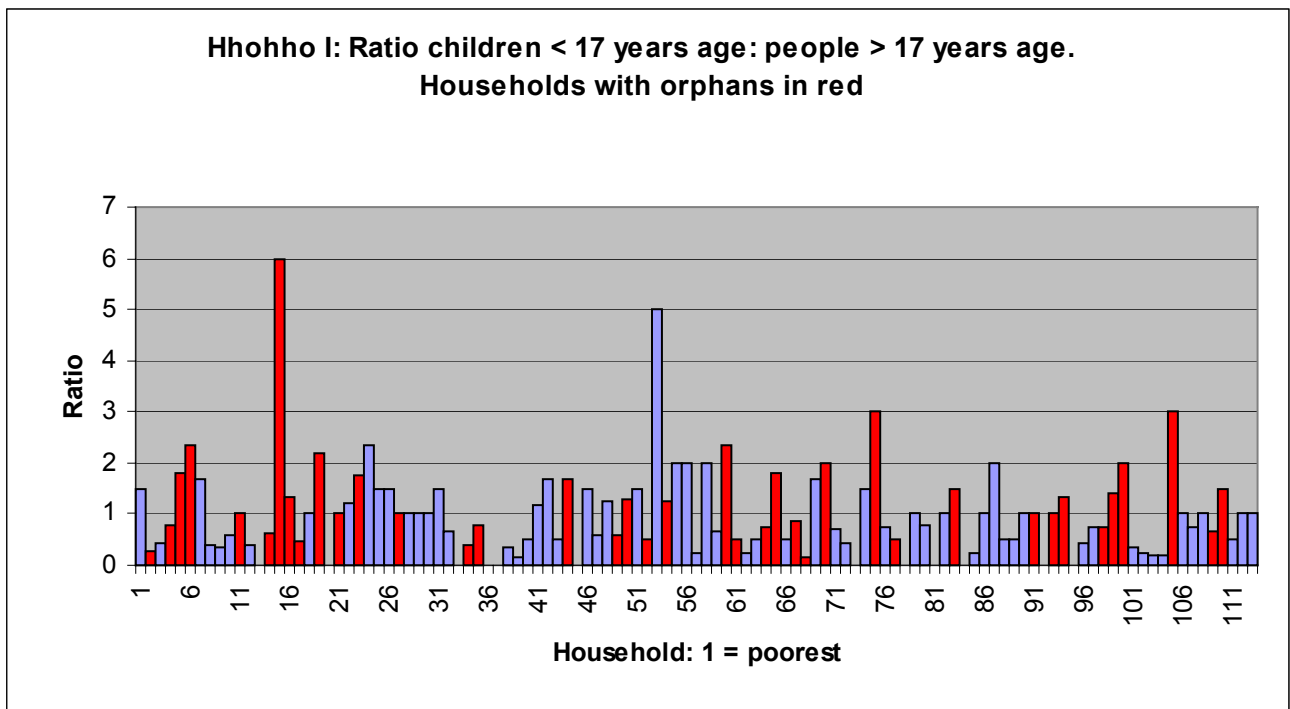


Figure 7. Adult equivalents/ household.

7.3.5 In Figure 8, households with orphans are shown in red (35% of all households included in the survey). Figure 8 (a) shows the number of households with orphans by disposable income group. Households with orphans are distributed across the range of disposable income with no clear relationship between the presence of orphans and household disposable income. Comparing the number of households with orphans in groups of households (e.g. in groups of 10 by relative wealth) suggests that there are relatively more households with orphans in the poorest and the richest groups. Forty percent of the 25 households which fell below the poverty line were households with orphans. This would be consistent with expectations as richer households can afford to take in orphans, and (Section 8) adult mortality causes economic decline in household status. However the result depends to some extent on the grouping used and the results are not presented here. As might be expected, households with orphans have a greater dependency ratio (average = 1.4) than those without (average = 0.8).



**Fig 8 Ratio of children <17 years: people >17 years. Households with orphans shown in red**

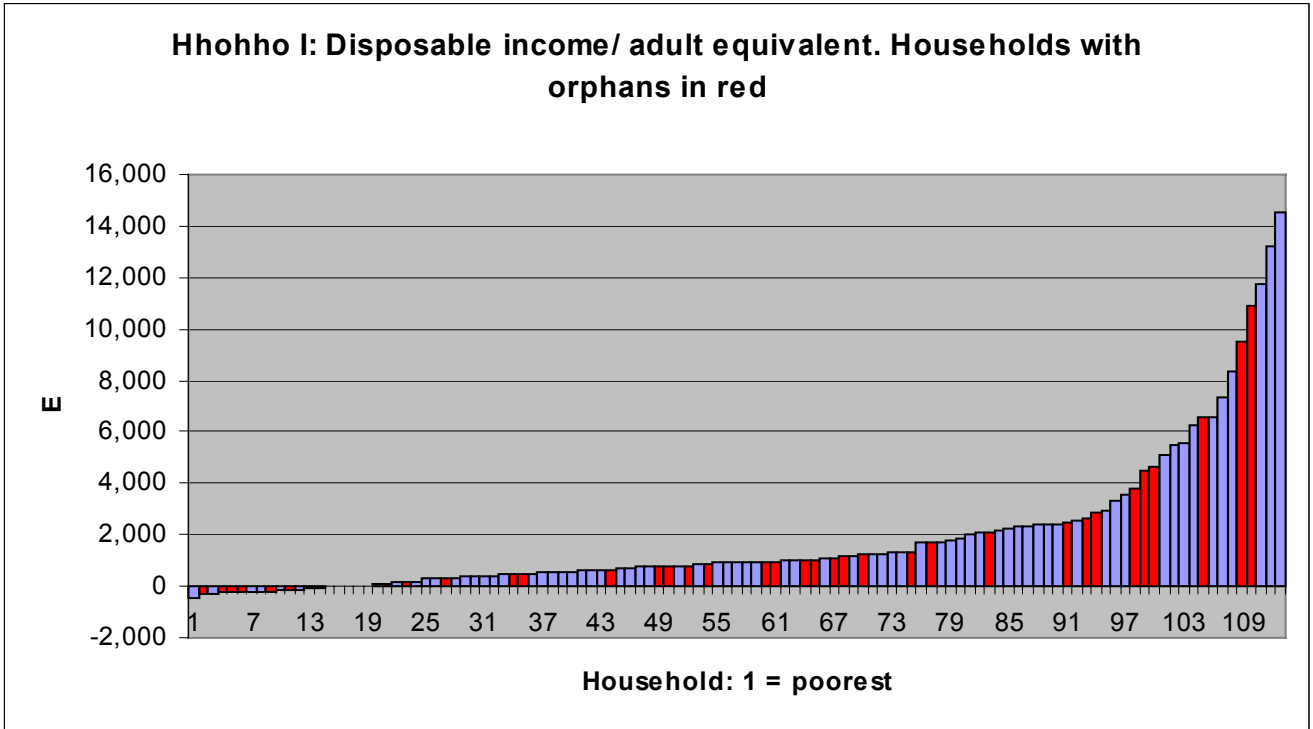


Fig 8a Disposable income /adult equivalent. Households with orphans shown in red

## **8. The impact of HIV/AIDS and production and other shocks on household economy and the standard of living**

8.1 In this section an estimate has been made of:

- (i) The direct impact of mortality on household disposable income and the standard of living.
- (ii) The additional economic burden of orphans where these have entered the community (i.e. because of the death of people resident elsewhere).
- (iii) The impact of drought and increased agricultural input prices on disposable income. The change in the vulnerability of households to agricultural shocks arising from HIV/AIDS.
- (iv) Changes in employment resulting from retrenchment and privatisation.

### *8.2 The direct impact of mortality on household disposable income and standard of living*

8.2.1 The impact of HIV/AIDS mortality on individual households and the overall economy of Hhohho I has been estimated by:

- replacing household income lost as the result of deaths which led to children becoming orphaned.
- adjusting household expenses in those households to take account of the increased household costs had that death or deaths not occurred.
- deducting the costs of orphans in households where orphans had moved into the community as the result of a death elsewhere.

8.2.2 This calculation represents a simulation of the economic status of each household had there been no HIV/ AIDS, all other factors remaining constant.

8.2.3 *This is based on two main assumptions:* (i) That the income lost from HIV/AIDS and adult mortality generally would in fact have continued up to the time of the survey; (ii) That the people who died would in fact have survived. This cannot be known, although we do know that employment income has generally remained

stable, particularly for those in salaried employment (see Table 4. below), and that non HIV mortality amongst young adults is likely to be low.

*8.2.4 The estimate omits* costs to the household associated with a period of chronic illness before death, and health care and funeral costs. The reason for this omission was that no information was gathered on the length of the illness of the person concerned or its effect on employment and income, or of levels of household cash savings (para 4.4.4). The impact of the former on household income during the period of illness could be considerable (e.g. if a spouse was unable to work). The impact of funeral costs would depend on household income but would tend to reduce savings or to force the sale of assets, and would increase their vulnerability and reduce their capacity to invest in subsequent economic activity. For scale, the lowest funeral costs are roughly equivalent to the total annual disposable income of the poorest 19% of households or the value of one cow<sup>27</sup> and for people in the lower and middle of the income range the burden is likely to be considerable.

*8.2.5 The estimate refers* to the 5-year period in which adult deaths occurred, resulting in orphanhood. This means that some HIV/AIDS deaths have probably been omitted. This might have included: a) people who were childless at the time of death b) people who died in the last 5 years with older children who would have moved out of the age group used to define an orphan by the time of the survey. The maximum number in the latter category would be 8 (the number of orphans identified in the age group 17-21 years).

8.2.6 The simulation result is shown in Figures 9 and 10 and Table 3. Figure 9 shows the impact, household by household, using the observed disposable income as the reference point. In Figure 10, the same data as in Figure 9 has been rearranged in ascending order of disposable income, to allow comparison of the change in the distribution of household disposable income. From Figure 9 it can be seen that the estimated disposable income/ adult equivalent of some households increases, and for others falls.

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<sup>27</sup> Funeral costs, including burial and feeding of mourners was estimated by key informants as follows:

Poor households:	E 1,100
Middle households:	E 3,000
Rich households:	E 5,000

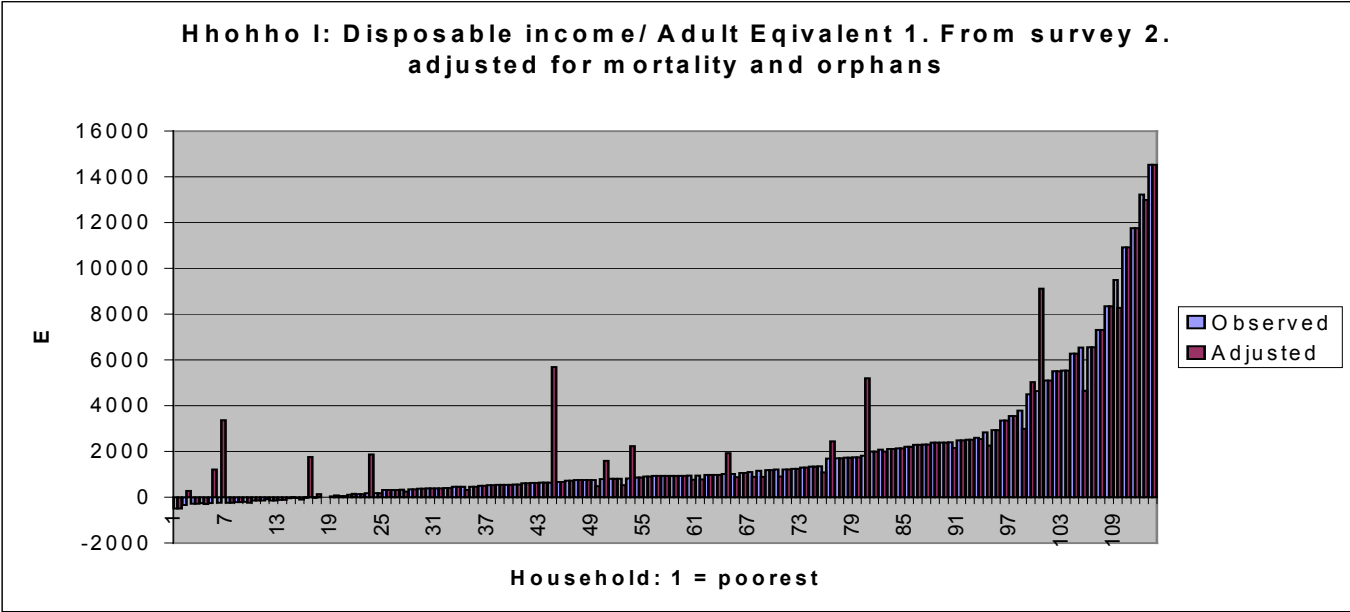


Figure 9. Disposable income/ Adult Equivalent by household: 1. As recorded on survey. 2. Adjusted for mortality and orphans. In both series households are in order of disposable income on survey.

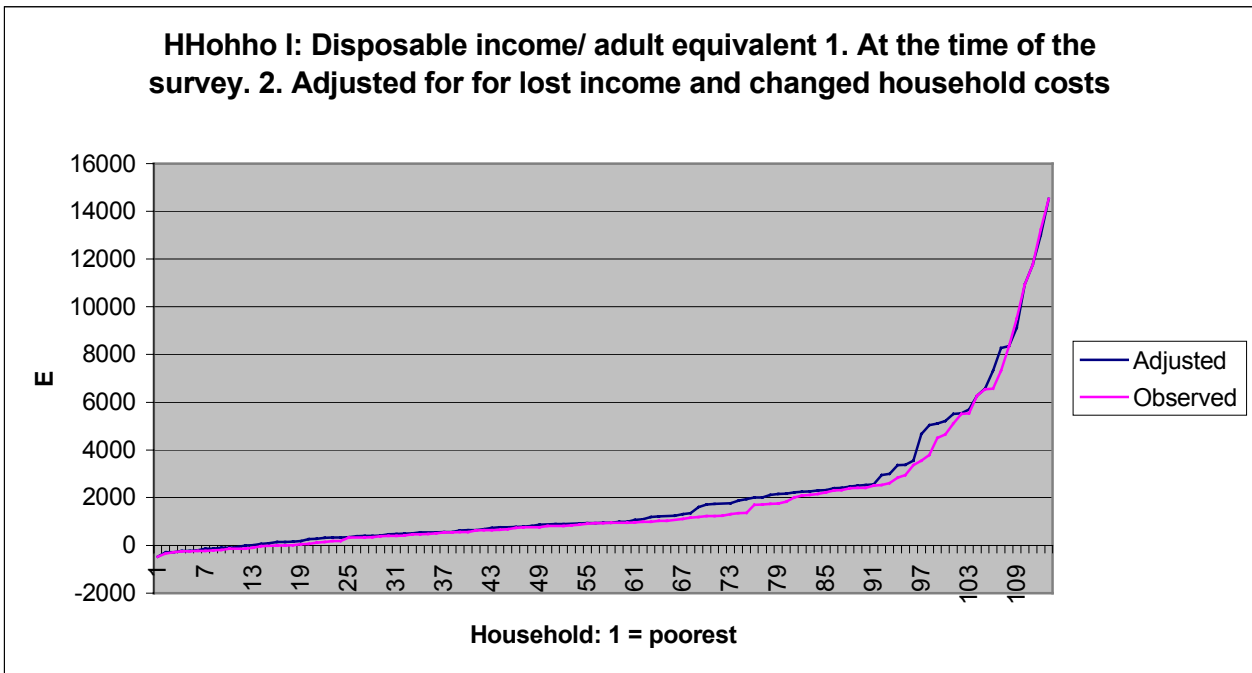


Fig 10 Disposable income/adult equivalent (observed) and adjusted for lost income and changed household costs

A	B	C	Occupation of deceased person(s)/ orphans entering the community	A	B	C	Occupation of deceased person(s)/ orphans entering the community	A	B	C	Occupation of deceased person(s)/ orphans entering the community
1	1	0	Long-term adolescent headed	37	39	2		70	77	7	
21	2	-19	Driver	38	40	2		71	78	7	
3	3	0		39	41	2		72	79	7	
2	4	2	Not employed ,	40	42	2		100	80	-20	Electrician, labourer
64	5	-59	2 forestry workers	41	43	2		77	81	4	
95	6	-89	Miner, 1 not employed	103	44	-59	Soldier	76	82	6	Not employed,+ orphan*
4	7	3		42	45	3		78	83	5	
6	8	2		43	46	3		79	84	5	
5	9	4	Housewife	44	47	3		81	85	4	
7	10	3		45	48	3		84	86	2	
11	11	0	+orphan *	32	49	17	Not employed(2)	85	87	2	
8	12	4		69	50	-19	Labourer SA	86	88	2	
9	13	4		48	51	3		87	89	2	
12	14	2	Not employed + orphans*	34	52	18		80	90	10	Not employed
10	15	5	Not employed	82	53	-29	Guard, housewife	89	91	2	
73	16	-57	Driver, butcher	49	54	5	Unemployed	90	92	2	Not employed
17	17	0	Waitress SA; not employed	53	55	2		91	93	2	SA Labourer
13	18	5		55	56	1		83	94	11	Not employed
15	19	4	Not employed, + orphan *	56	57	1		92	95	3	
14	20	6		57	58	1		94	96	2	
18	21	3	Not employed, + orphan*	58	59	1		96	97	1	
16	22	6		46	60	14	Not employed	93	98	5	Not employed
74	23	-51	Teachers(2)	47	61	14	Not employed	98	99	1	Sister-in-law, not employed
19	24	5		59	62	3		109	100	-9	Govt employee
23	25	2		60	63	3	Casino manager	99	101	2	
24	26	2		75	64	-11	Labourer	101	102	1	
20	27	7	Not employed	50	65	15	Not employed	102	103	1	
25	28	3	Labourer	61	66	5		104	104	0	
26	29	3		52	67	15	Not employed	97	105	8	
27	30	3		51	68	17	Not employed	105	106	1	
28	31	3		63	69	6		106	107	1	
29	32	3		54	70	16	Housewife	108	108	0	
30	33	3		65	71	6		107	109	2	Not employed
22	34	12	Not employed	66	72	6		110	110	0	Not employed
31	35	4	Not employed + orphan*	67	73	6		111	111	0	
33	36	3		68	74	6		112	112	0	Foreman, Housewife
35	37	2		62	75	13		113	113	0	
36	38	2		88	76	-12	Not employed, +orphans*				

TABLE 3 (previous page) shows (a): Simulated order of household disposable income, assuming no HIV/AIDS losses. (b): order of household disposable income from survey. (c): Change in rank between (a) and values found on survey e.g. The household which was 73<sup>rd</sup> above the poorest household (column A) assuming no HIV/AIDS, fell to 16<sup>th</sup> poorest (column B) with HIV/AIDS.

8.2.7 Increases in household disposable income, which are small, reflect the loss of an underemployed or unemployed individual, whose cost to the household exceeds their income. Falls in income, which are much larger, result from the death of people in employment. In several cases, household income collapses and the household descends into poverty. Table 3 shows, household by household, the change in relative disposable income between the two scenarios and the occupations of those who died.

8.2.8 The estimated change decline in total community disposable income is 8.3%. If only households that lost income are included, this estimate rises to 11.5%. As noted this is likely to underestimate the true cost.

8.2.9 The proportion of households below the poverty line changes very little, from 22% recorded on the survey to 20% 'without HIV'. This reflects no more than the fact that most of the households with orphans were comparatively wealthy and the loss of an adult did not push them below the poverty line.

8.2.10 Seven households accepted a total of 10 orphans following the death of a non-resident relative. The estimated total cost of these orphans is E 11,797, including school fees (1% of total community disposable income). This is accounted for in the calculated change in total community disposable income i.e. it is not additional.

*8.3 The impact of increased agricultural input prices, and drought on household disposable income.*

8.3.1 The rise in input costs

Highveld agriculture is highly input dependent. Without agricultural inputs, maize cultivation was estimated to yield approximately 750kg/ Ha. With full inputs (i.e. ox or tractor hire, lime, seed, fertiliser, pesticides and herbicides) and good weather conditions, the maximum return is estimated at 6,800kg/Ha, although from local sources 4000kg/Ha may be a more typical level of production. Full inputs / ha,

omitting fencing costs<sup>28</sup>, in the reference year (2001-2), cost E2648 / Ha. In 1999, before the rise in input price, full inputs cost E1705 / Ha.

8.3.2 Neglecting inflation, assuming the use of full agricultural inputs and taking the local maize price of E 1.45/ kg for the reference year (2001-2), the rise in input prices between 1999 and 2002 reduced net return on maize production by 24% i.e. from E4100/ Ha to E3,152 / Ha.

8.3.4 The reference year was a drought year in much of southern Africa. The Highveld was less affected than other parts of Swaziland although rainfall was reduced to 80% of normal (Swaziland Government Early Warning Unit) and maize production was affected by a dry period in January 2002. Average reported maize yields of 77 households which grew maize in the reference year, and for which data is available, was only 780 Kg /Ha, although with wide variation around the mean (Figure 11).

8.3.5 Neither the value of inputs use/ Ha and household disposable income, nor production/ Ha and household disposable income were correlated ( $R^2 = 0.0012$ , 0.0000 respectively) i.e. on average, area for area, better off households made no greater investment in maize cultivation than poor ones, and had much the same production/ Ha. However, of the 14 households that used no purchased inputs, 13 were in the poorest 34% of households.

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<sup>28</sup> Fencing is required to exclude livestock. The cost varies with the type of posts and the number of strands of barbed wire. Wire lasts for up to 10 years; as most households grow some wattle the cost of replacing wattle posts is only the labour required.

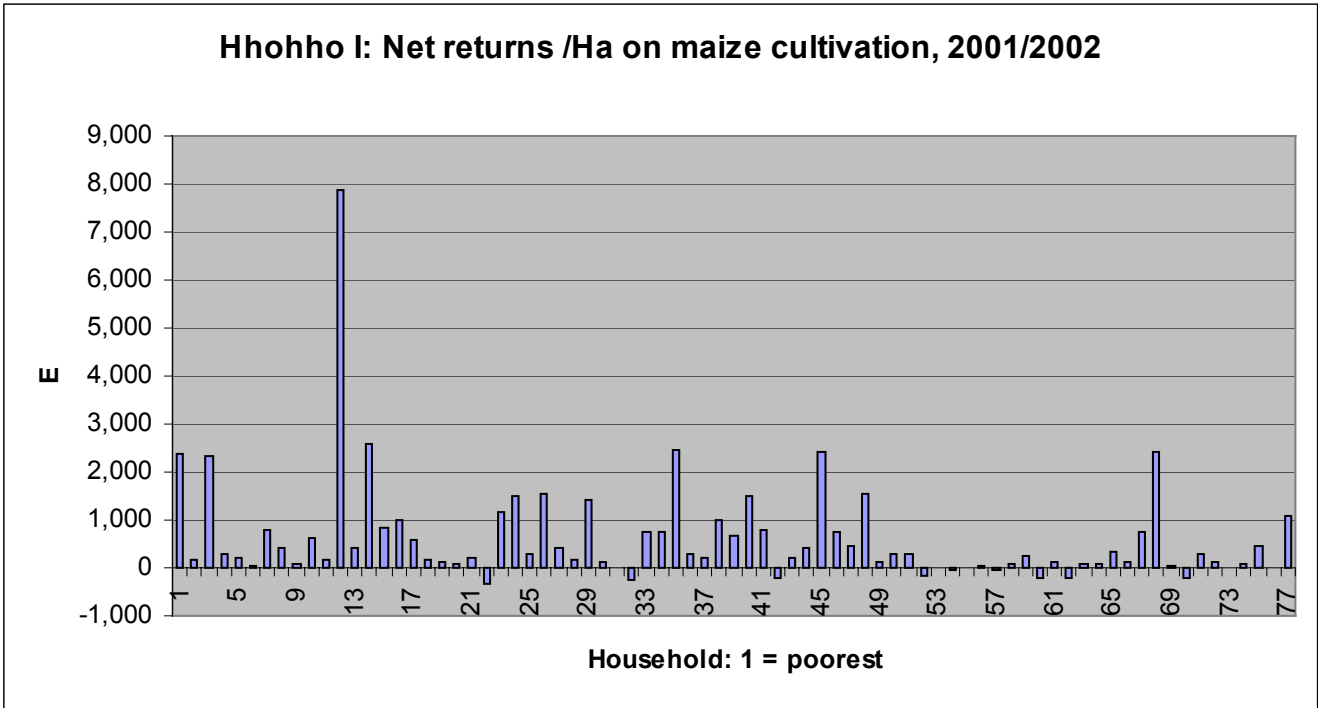


Figure 11. Reported net return on maize cultivation/ Ha, by household. Households in order of disposable income

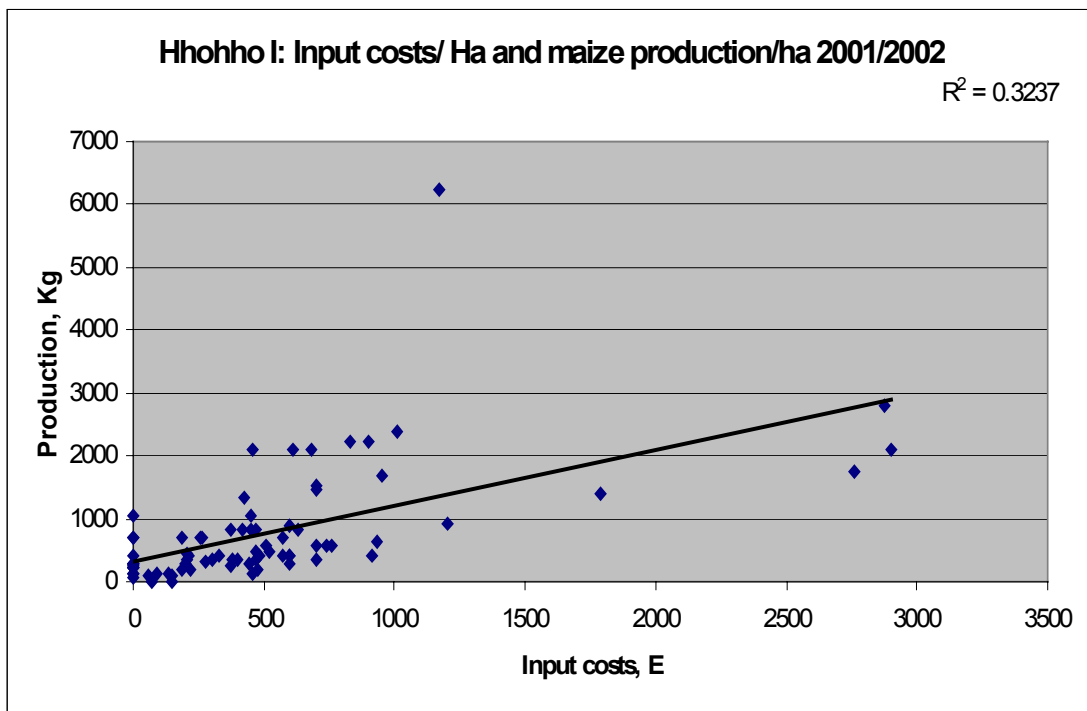


Figure 12. Relationship between input costs / Ha (E) and maize production/ Ha (kg), 2001/2002

8.3.6 Maize production/ Ha was correlated with the levels of inputs used/ Ha (Figure12, Input Costs and Maize production) ( $R^2 = 0.32$ ). On average, greater input use led to greater returns. Assuming a linear relationship, average production varies by a factor of about 10 between no inputs and full inputs. However at all levels of input use production varies widely.

8.3.7 Net returns/Ha (i.e. the value of maize produced – input costs) were also very variable. However, very few farmers appear to have lost money on cultivation. Sixty-six farmers made an average of E747/Ha: 11 farmers (15%) lost an average of E153/Ha<sup>29</sup>.

8.3.8 The data is consistent with those farmers who could afford inputs, minimising inputs to maximise the likelihood of getting some return. For poorer farmers who cannot afford inputs, a low input simply leads to low returns. A similar pattern is found in the other years for which we have some data: in 1999/2000 a year of reported normal rainfall, inputs and returns are more highly correlated ( $R^2 = 0.55$ ), and average yields are low (517 Kg/Ha) and very variable, although data is available for less than half of all households (N=47). It is therefore not possible to say to what extent the observed pattern of low investment is a recent one, arising from a period of uncertainty resulting from changes in input and maize prices and drought, or is a longer term pattern resulting from some other cause (e.g. uncertain production from crop diseases).

8.3.9 From the perspective of household income and standard of living, the situation is one where, if more consistent returns could be obtained, maize production remains potentially highly profitable. Figure 13 shows the change in disposable income/adult equivalent that would be expected if maize were grown by all households in Hhohho I (1) as reported for 2001/2002 i.e. a drought year, (2) using the low input scenario (para 8.3.1) and (3) using full inputs on all cultivable land and assuming a return of 4,000Kg/Ha. The simulations ((2) and (3)) assume good weather conditions.

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<sup>29</sup> At a price of E1.45/ Kg. This figure was obtained as an average of prices actually obtained by households during the long interviews. The 2001/2002 National Marketing Corporation price was E0.985 /Kg.

**Hhohho I: Disposable income/ Adult Equivalent 1. Reported  
2001/2002. 2. Low input simulation. 3. High input simulation using  
all cultivable land**

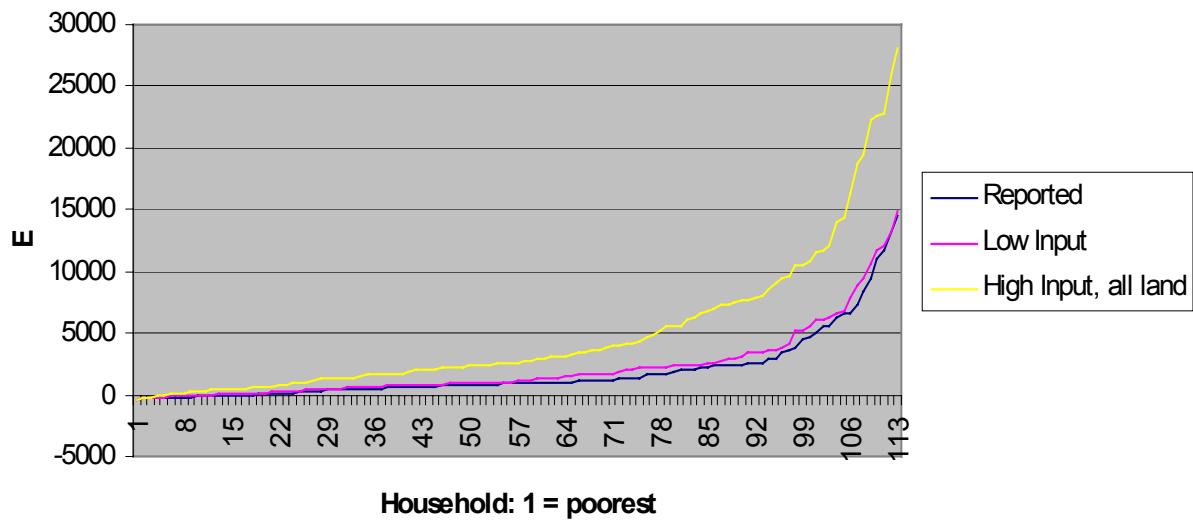


Figure 13. Disposable income/ adult equivalent. 1. From survey findings. 2. Low input simulation (750kg/maize/Ha). 3. High input (4000kg/maize/ha). All series in order of disposable income.

8.3.10 The effect of a substantial increase in maize cultivation is to almost double the disposable income of the richest household. For the poorest households the effect is much less dramatic but proportionally similar. *Not including the cost of inputs* the proportion of households below the poverty line falls to 9% (from the 22% recorded on the survey). *Including input costs* in household expenses the proportion below the poverty line rises again to 20% - which is no more than to say that despite a rise in income from maize production, many households would still be unable to afford input costs in a subsequent year.

## 9.0 Changes in employment resulting from retrenchment and privatisation

9.1 The pattern of employment of those people in employment at the time of the survey, or who had been employed 5 years previously is shown in Table 4; the previous employment of people who are currently unemployed is also indicated. The table omits individuals who were not in defined self-employment or in paid employment (overwhelmingly farmers and housewives).

**Table 4 Stability of Employment**

<b>Higher paid occupations</b>	
All employed people:	88
In same occupation 5 years ago	58 (66%)
In a different paid job 5 years ago	11(12%)
Unemployed 5 years ago	5 (6%)
School leaver	14 (16%)
Of those who changed job in the last 5 years:	
Moved up to a better job:	8
Moved down:	3, of whom 2 were miners
<b>Lower paid occupations</b>	
Of all employed people:	98
In same occupation 5 years ago	48 (49%)
In a different paid job 5 years ago	11(11%)
Unemployed 5 years ago	18(17%)
School leaver	21(21%)
Of those who changed job in the last 5 years:	
Moved up to a better job:	6
Moved down:	5
<b>Unemployed people</b>	
Of all unemployed people:	13
Unemployed 5 years ago	4
Employed 5 years ago	9, of which 1 miner, 1 soldier, all others lower paid
Retired	4

9.2 With the exception of three people who had been miners (a higher paid occupation), the impression is of a relatively stable employment market: almost all people who were unemployed 5 years ago are re-employed, more often than not in a

better paid job. This is consistent with the reported retrenchment in mining and the change in income and job security from forestry work.

## **10. The characteristics of the poorest households**

10.1 This study was not designed to establish the determinants of poverty and wealth in Hhohho I. Access to regular salaried employment is the critical factor that separates rich and poor households and access to most higher paid jobs is contingent on a certain level of education. We did not systematically record adult education levels.

10.2 However, as already noted, 40% of the 25 households which fell below the poverty line were households with orphans, a figure which rises to 54% if households which had accepted an orphan or orphans from outside the community are included. This is a much greater proportion than in the remaining 83 households (29% and 8% respectively). Of the 10 households that had suffered an HIV death, the simulation suggests that at least 5 of these had previously been in a much higher income group (table3). The remaining households have the characteristics of less access to land, greater levels of unemployment and low-paid employment; they have a larger number of children to support or face a variety of social difficulties. One household is the disadvantaged half of a polygamous marriage; one abandoned by the male head of household and the poorest household in the community is headed by an adolescent and does not cultivate due to lack of inputs.

## **11. Conclusions**

11.1 Omitting the costs associated with illness and funeral costs, extra adult mortality attributable to HIV/AIDS over the past 5 years, has caused a fall of approximately 8-12 % in total community disposable income. The economic impact on individual affected households is specific to the circumstances for the household, ranging from a small improvement in income/adult equivalent to devastating loss. In this relatively wealthy community, the net effect is to make very little change to the proportion of households falling below the defined poverty line

11.2 A disproportionate number of households below the poverty line had suffered an HIV/AIDS death, or were supporting orphans from outside the community.

From the perspective of action to mitigate the impact of HIV/AIDS two main issues arise:

1. From the policy/ intervention perspective the problem is to find ways of assisting poor households according to their particular needs and capacities.
2. Although this community has managed to absorb the economic impact of HIV/AIDS to a remarkable degree, the question remains as to the future evolution of the epidemic and the economic burden that this will place on households and the community. At the time of the survey there were 99 children in this community who have lost one or both parents, a figure that would seem likely to rise further in future.

11.3 From the survey, the areas which suggest themselves are support with school fees for all poor children, support with agricultural inputs and, potentially, community based agricultural initiatives.

#### 11.3.1 *School fees*

In many countries, high rates of non-attendance and primary school drop out are associated with HIV/AIDS. In this community, school attendance rates are high (95% of the primary school aged population does attend school). As would be expected, non-attenders (with one exception<sup>30</sup>) all fall into the poorest half of the income distribution. However, of the 16 children who do not attend primary school, only 4 come from HIV/AIDS affected households, whereas 12 come from non-HIV affected households. Six of these children are from the poorest 10 households in the community. This suggests that government and NGO programmes aimed at keeping AIDS affected children in primary school are effective in their targeting. However, poor children from households that are not affected by HIV/AIDS do not receive assistance - a clear indication of the problems that can result from 'AIDS exceptionalism'. Moreover, this support is only available on an ad hoc/year on year basis.<sup>31</sup>

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<sup>30</sup> The reason for this child's non attendance was not explored and may be due to a range of reasons including disability, chronic ill health etc

<sup>31</sup> Detailed study of these schemes was beyond the scope of the present study.

11.3.2 Lifting the burden of primary school fees on a *regular* basis would both open opportunities to children who are currently unable to complete primary school due to the cost of education, and free up income for other items of expenditure in households where children attend school but household income is low. As in this context education often leads to higher earning potential it would be a logical approach to securing the economic future of at some HIV/AIDS affected households.

#### 11.4 *Agricultural inputs*

11.4.1 Support with agricultural inputs, agricultural management and access to land. The potential benefits of supporting input costs for households that are not currently cultivating all the land to which they have access, and who cannot afford to pay for inputs, would be considerable (assuming a good return) and offer a sustainable way of providing support. However, given the observed risks of maize cultivation (section 8.3) this requires further investigation. As maize cultivation requires only low labour inputs, it would potentially possible for almost any household (e.g. adolescent headed) to engage in maize cultivation.

#### 11.5 *Community based initiatives.*

Given the fairly high levels of underemployment in the community, it is feasible that land set aside under the NERCHA programme could be used to provide assistance to the poorest households. However, unless additional money is made available for fencing and input costs, this land is likely to remain uncultivated. For 1 hectare approximately E10,000 would be needed for fencing and inputs.

#### 11.6 *HIV/AIDS and targeted interventions*

11.6.1 Other interventions, such as targeted food aid, distributed through school feeding projects, mother and child health (MCH), and community based orphan support programmes, have been widely canvassed as a means of mitigating the effects of HIV/AIDS (e.g. FAO 2003). However, the view that that households that have lost labour and cash income through HIV/AIDS, could best be assisted by this mechanism, is not wholly supported by this study. There would be some scope for food distribution to selected poor households.

11.6.2 Further areas that merit consideration might include price subsidies on basic foods for the poorest consumers, effective taxation on higher income earners and promotion of local formal sector employment.

## **Save the Children, March 2004**

### **Annexe 1**

#### ***The Model***

##### *Background*

In this study, household economy methods adapted from methods originally developed at SC UK for famine prediction, (the 'household economy approach') have been used. Famine prediction requires the ability to estimate household 'food entitlement' i.e. the ability of a household to acquire food under changed conditions e.g. of price, production, market access (Sen, 1981). Knowledge of reduced food production levels, (for example from drought) is not in a reliable or useful predictor as some or all households may (i) not grow crops, or crops that are drought prone (ii) may be able to make up any deficit in production in other ways e.g. by selling assets, falling back on wild foods etc.

The household economy approach was developed to see if it was possible to estimate household entitlement within and between defined populations of different economy (e.g. poor, better-off; cultivating, pastoral) with sufficient accuracy to allow predictions to be made of the likely impact on household economy of production failure and other shocks. To be effective the method also had to

- Produce output in terms that would be convincing to donors and other agencies.
- Be based on clear objectives e.g. to allow for a household to retain livestock and other assets and to maintain some access to non-food goods as well as food.
- Be able to identify possible interventions e.g. market support, which could be used to prevent a food crisis occurring.

The approach developed was therefore based on an economic model, to simulate the most likely outcome of the impact a shock or shocks on household food entitlement. To meet the other operational criteria it was important to keep the model as simple as possible. Put in other terms, the aim was to allow a user to develop a logical, quantified case about the most likely impact of a stated shock on economy at a high level of disaggregation (e.g. the impact on the poor) where the assumptions are explicit, areas of uncertainty are revealed, and where the prediction is open to test e.g. if a prediction is made that people will sell livestock, this, or a fall in livestock prices should be observed.

For famine prediction, information is required on large areas of diverse economy and a simplified data set is used. For each defined population, this includes a household budget and an estimate of household assets, for each of at least three 'typical' wealth groups (poor, middle, rich), with information on access to wild foods and gifts e.g. charity, food and asset transfers between kin. In larger scale applications an understanding of the market in labour, livestock and other goods is required.

The basic simulation is extremely simple i.e. the shock is used to adjust household food and non-food income to reveal the amount of food and cash remaining to the

household and therefore (given stated assumptions about non-food costs) the ability of the household to acquire sufficient food. For example, at the simplest level, a household that made 50% of its income from maize cultivation in a baseline year, would, if maize production fell by 50%, suffer a fall of 25% in its income. If the household had maize stocks equivalent to 10% of its annual requirement, this would reduce the deficit to 15%.

In practice, households may produce some of their own food, exchange this for other food items and cash and have multiple employment and other income sources, and the 'shock' may involve multiple changes e.g. to prices and production levels. The basic calculations become very intricate but remain the same.

This approach has proved to be very effective. In all cases where we have some measures of actual outcome (a total of 14 examples) this has been consistent with prediction. The method has been widely used (e.g. by Operation Lifeline Sudan (OLS) in southern Sudan, for the prediction of the recent famine in Malawi), and has been adopted by USAID/FEWSNET and others. The operational effectiveness of the model lies largely in its structure (i.e. the simulation of the actual steps which households can take to preserve their livelihoods); the detail and 'completeness' of the data set, and the relative simplicity of the mathematics.

#### *Methods used in this study*

In this study the same basic model has been used. The differences are:

- That all households in the community were included and data was collected on each household separately.
- The data set was extended to include a detailed description of household membership and relationships and for households with orphans their origin and (because of its importance as an actual and potential income source) maize production.
- The output is in terms of the household disposable income/ adult equivalent.

In this case, the 'shock' (HIV/AIDS), unlike production failure or a price change, has been of varying intensity and spread over many years. The estimate of impact therefore relates to only part of the epidemic (a period of approximately 5 years), in which deaths leaving orphans occurred. The assumptions on which this calculation is based are discussed in the text (section 6).

#### *Example*

The calculation of the impact of an (assumed) AIDS death on a single household is carried out as follows. Taking for example a household of 4.2 adult equivalents with 2 primary school age orphans, which produced all the food it required for consumption and had a total cash income from all sources, of E3,000, where the death was of a person earning E5,000/year.

The recorded disposable income/adult equivalent in the reference year would be  $E3,000/4.2 = E714/\text{year}$

If the death had not occurred, the household would have

$4.2 + 1 = 5.2$  adult equivalents.

A cash income of E3,000 + E5,000 = E8,000/year.

However household food production would now be insufficient to meet household needs. If the adult requirement is 949,000kcal/year, the maize flour equivalent would be, at E3/kg, E780/year.

The disposable income/ adult equivalent if there had not been an HIV death would be  $E8,000 - E780 / 4.2 = E1719$ .

In estimating the household standard of living, household costs would be increased for one additional adult household member.

This calculation is repeated for all households in the data set.

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This study forms part of a four-country research programme funded by DfID. The overall goal is to develop methods of measuring and analysing poverty and modelling the impact of change at household level. The aim of this study was to test the use of individual household economy methods in an area of high HIV/AIDS prevalence; to identify the main factors affecting income levels in HIV affected and non affected households and to explore possible uses of household economy methods in programme design and monitoring.

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