UNIVERSITY OF MINNESOTA


# The Whole Village Project

## Village Reports for Hinduki, Ipililo, Mwang'holo, and Zebeya in Maswa District

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## ACRONYMS

| | |
|---|---|
| COSTECH | Tanzania Commission for Science and Technology |
| FGD | Focus Group Discussion |
| HH | Household(s) |
| IYCF | Infant and Young Child Feeding |
| KAP | Knowledge, Attitude and Practices |
| NGO | Non-Governmental Organization |
| NIMR | National Institute of Medical Research |
| SFTZ | Savannas Forever Tanzania |
| STD | Sexually Transmitted Disease |
| TAWIRI | Tanzanian Wildlife Research Institute |
| TDHS | Tanzania Demographic and Health Survey |
| TFR | Total Fertility Rate |
| THIS | Tanzania HIV Indicator Survey |
| TSH | Tanzania Shillings |
| UMN | University of Minnesota |
| USAID | U.S. Agency for International Development |
| WHO | World Health Organization |
| WVP | Whole Village Project |

# 1 INTRODUCTION

The purpose of this report is to present district officials and local leaders with multi-sectoral data across several villages in this district. We hope these data may be useful in seeing the strengths and weaknesses of different sectors and the variation across villages. These data may be useful in prioritizing future development projects. The villages represented here were selected by our donors for their project purposes and therefore they cannot be seen as representatives of the district. The data however, illustrate the diversity of economic and social development activities occurring across villages in the district.

The Whole Village Project (WVP) is collecting and analyzing comprehensive data at village level over an extended period of time. A collaborative project between Savannas Forever Tanzania (SFTZ), a Tanzanian NGO, and the University of Minnesota, USA, the Whole Village Project has a **vision** to work with people in rural Tanzanian villages to acquire and use knowledge for improving long-term health and well-being while sustaining natural resources. To achieve this goal, quantitative and qualitative data are systematically collected in villages across northern Tanzania by the Savannas Forever team in partnership with staff from the National Institutes of Medical Research (NIMR) and the Tanzanian Wildlife Research Institute (TAWIRI). The data are sent to the University of Minnesota for analysis and then returned to Tanzania. The SFTZ team returns to each village to present the data to villagers for their own use and decision-making. WVP intends to return to each village every two to three years in order to assess the sustainability of development projects over time and identify best practices.

In this report, we present a summary of data collected within a single district. Household surveys, interviews and focus groups were conducted in Hinduki, Ipililo, Mwang'holo, and Zebeya District during the month of September 2010.

# 2 METHODOLOGY

The Whole Village Project's survey tools and methodology has been reviewed and approved by multiple Tanzanian research authorities (COSTECH, NIMR and TAWIRI) and the University of Minnesota institutional review board for the ethical conduct of human subjects research. Further,

permissions are sought by the respective regional, district and village leadership before beginning data collection.

Village selection is based on the funding agency priorities and permission of government leaders. After permissions are received the Savannas Forever Tanzania (SFTZ) staff arrange dates for data collection with district officials and village leaders. A Tanzanian survey team of 6-7 personnel work in each village for 5-6 days. The team begins with a sensitization session with leaders and community members to introduce the project and staff. Village leaders provide a roster list of heads of households and the research team uses a computer generated randomization program to select 60-75 households from this list. A standardized quantitative survey is conducted in each selected household.

Data collection tools include both quantitative and qualitative instruments. All interviews and focus groups are conducted in Kiswahili whenever possible. If respondents are not fluent in Kiswahili, a bi-lingual villager is identified by the leadership to translate from the local language to Kiswahili. The core household survey asks questions about livelihood, earnings, educational status of all household members, assets, health and natural resource use. From the household members, two brief individual level surveys are conducted: (1) a HIV/AIDS knowledge, attitude and practice (KAP) survey and (2) an anthropometric assessment of children under-five and nutrition questions. For the KAP survey, up to 4 adults (15 years or older) within the household are asked to complete the survey. All interviews are conducted in a private space where no one else may listen. All children in the household under five are weighed and measured and the primary caretaker is asked to answer the accompanying survey.

In order to obtain more contextual data about each village, a number of focus group and key informant interview tools are used. Focus groups are conducted with men and women, village leaders, and a special group of agriculturalists and livestock holders. Village leaders invite villagers to participate and try to obtain diversity of representation by sub-village, age and gender. The research team also conducts an institutional assessment of village organizations with a mixed group of 10-15 villagers to identify the different NGOs, religious organizations, and government services working in the village and their respective strengths, weaknesses and contributions to the community. In addition, key informant interviews are conducted with school headmasters and clinic officers. A detailed list of survey instruments and focus group guides can be found in Appendix A.

# 3 KEY FINDINGS

The research captured a broad range of information from four villages in Maswa District, Hinduki, Ipililo, Mwang'holo, and Zebeya. Overarching district strengths, gaps, and opportunities were pulled from the abundance of data collected and analyzed and are presented below. Detailed results and discussion are presented in Section 4.

## 3.1 District Strengths

There are a number of common strengths observed among the four villages. In particular, they have a relatively high number of assets as compared to other villages surveyed to date, mosquito net ownership, relatively short distance to weekly market, high rates of child vaccinations for BCG, DPT and polio and a low percentage of child with malnutrition.

Mosquito nets ownership is over 90% in Ipililo, Mwang'holo, and Zebeya; in Hinduki, it is also as high as 85%. In addition, 60-70% of nets had recently been dipped in insecticide treatment. Given the high rates of malaria in the area increasing bed net coverage to 100% and regular dipping of nets should be encouraged.

Maswa district has relatively high ownership of bicycles and cell phones. Over 60% of households surveyed own at least one bicycle (except in Mwang'holo, which is 57%). Also, In Hinduki, Ipililo, and Zebeya, cell phone ownership is higher than 40%.

Infant and young child vaccination rates for BCG, DPT and polio were over 95% in almost all villages (except in Mwang'holo, and DPT vaccination in Ipililo: 92.3%). However, vaccination rates for measles drop to about 60-80%; given the virulence of this disease, clinic officers and health committee members should identify strategies to meet the gaps in measles vaccination. In addition, only 55-75% of infants and children took Vitamin A supplements, again the community should strive for 100% coverage given the low Vitamin A intake in local diets and the significant impact that Vitamin A deficiency has on child development. In most villages the z-score for malnourished children was just 0 to 2%, however in Zebeya, 3% of children were severely malnourished and 6% were moderately malnourished.

## 3.2 District Gaps

Access to drinking water is limited in Maswa district. Although the access to protected water source is very high in Ipililo and Zebeya (83%), it is as low as 13% and 35% in Mwang'holo and Hinduki. In addition, the proportion of households that do something to make the water safe is very low. In Mwang'holo and Hinduki, although the vast majority of water sources are unprotected, only 28% to 35% of households treat the water to make it safe.

Access to quality health services is also limited in the district. In Maswa District, only Ipililo and Zebeya have dispensaries. According to men's and women's focus group discussions, malaria is the number one problem followed by stomach and feet aches and HIV/AIDS.

The food security level is low in Maswa district. Around 25% to 45% of households surveyed worried about food in the last week. Over 80% in all villages had limited food during the last week. Also, as high as 1 out of 10 households in Zebeya went one day and night without food. However, given the low food security level, only 5-15% of households have kitchen garden to alleviate the problem.

The level of one's education is often a predictor of other quality of life factors such economic productivity, food security, and overall health. In Zebeya and Ipililo, the big concern is the significantly lower percent of girls attending secondary school. Girls' education often is a predictor of family health in future; further Tanzania has set increasing girls participation rate in secondary school as a Millennium Development Goal. Other quality factors include a low teacher to student ratio, low textbook to student ratio, and the limited food available at school. Children are the future. However, if they are not able to access quality education their chances for improved quality of life as adults are greatly reduced.

Newcastle Disease is the number one cause of chicken mortality in Tanzania. Vaccination rates against Newcastle Disease are low in Maswa District. Only 6% to 27% households owning chickens vaccinate those chickens against Newcastle Disease. Household surveys revealed that 30% to 45% of chickens had been lost to disease in the past year in these villages.

## 3.3 Opportunities

Safe drinking water is significant to the health condition of the residents. In villages with high access to protected water sources, as Ipililo and Zebeya, the water are mainly from public tap/standpipe and protected well while in Hinduki and Mwang'holo people get water primarily

from unprotected well and surface water. If these villages can share the technique of obtaining protected water, the chance of getting disease from drinking water will be decreased significantly. Also, village leader is responsible of spreading the knowledge of how to treat water to make it safer, for example, boiling.

Households with kitchen gardens tend to have less serious food insecurity problems. Specifically, villages with higher coverage of kitchen gardens tend to have a lower percentage of households that went to bed hungry, ate limited variety of food, and fewer underweight children. However, kitchen garden training remains very limited in the villages surveyed in Maswa district. Village leaders have the opportunity to convey knowledge about kitchen gardens as a means to alleviate food insecurity.

Girls' participation in secondary school is quite low. The education committees in all villages have an opportunity to work with district leaders to identify opportunities for identifying solutions to this and improving the quality of schools in the district overall. As education creates a foundation for overall family health and economic opportunities, prioritizing education is critical for the future development of this district.

Increasing livestock vaccination rates will reduce the rate of cattle and goats lost to disease, which is still relatively high. In addition, although many households have heard of Newcastle disease, only a small proportion of chickens are vaccinated. Therefore, villages have an opportunity to reallocate resources to increase livestock vaccination rates, which is effective in reducing livestock lost to diseases.

In the past year, only Hinduki and Ipililo were visited by an agricultural extension worker. These agricultural extension workers typically train a small group of local farmers in agricultural best practices and established model farms (growing maize, sunflowers, etc.) as demonstration plots. The trained farmers are expected to transfer knowledge and skills learned to their own farms. Given that the most common complaints of farmers was lack of knowledge of improved farming techniques and other measures, there appears to be an opportunity to further spread agricultural knowledge from model farmers to others and improve the productivity of farming. The district should monitor the impact of the work done by agricultural extension workers.

District leadership also has an opportunity to further protect the children in the district from vaccine-preventable disease. A high percentage of children under-five in Maswa District are

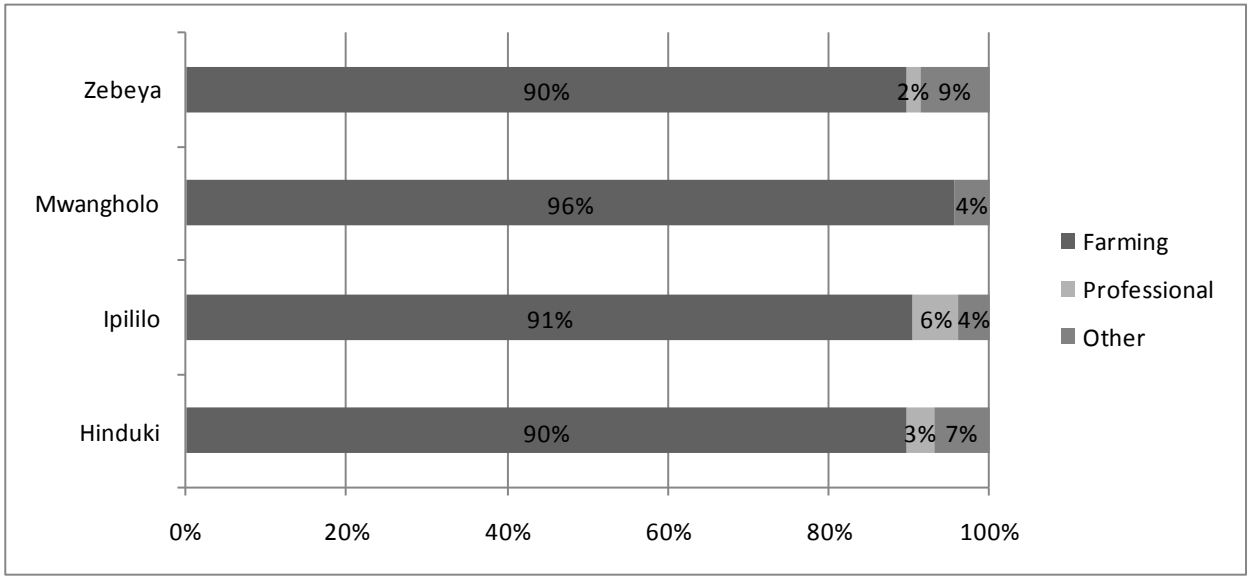
vaccinated against tuberculosis (BCG), DPT, and polio, as recommended by the World Health Organization (WHO). However, vaccination coverage is not universal, especially for measles. Given the already high level of vaccination, the district has an opportunity to reach universal coverage against vaccine-preventable disease given the proper allocation of resources.

# 4 RESULTS AND DISCUSSION

## 4.1 Household Livelihood and Assets

In the villages surveyed, over 90% of household heads reported farming as their main occupation (see Figure 1). The remaining primary occupations of household heads included professionals and small business owners. Only one household head (Mwang'holo) listed livestock keeping as their main occupation.

**Figure 1. Main Occupation of Household Head**




More households are headed by a man than a woman in all villages surveyed. The percentage of households headed by women varies from 11% to 14%.

Income, in the form of cash or goods, is most commonly generated through agricultural production. Village leaders in all villages listed cash crops as the top one livelihood strategy and including subsistence farming and livestock as the three most common forms of livelihood strategies. This is reflected by the fact that majority of the households sell cash crops in Mwang'holo (50%), Ipililo (80%), Zebeya (100%), and Hinduki (100%). Other cash sources include small business, fire wood, alcohol, and medicinal plants.

Focus group discussions (FGDs) facilitated with men and women investigated activities that could improve the livelihoods of village members. The highest ranked recommendation by participant type by village is listed in Table 1.

**Table 1. Village Recommended Activities to Improve Local Livelihoods**

| Village | Men | Women |
|---|---|---|
| **Hinduki** | Fish farming<br>Vegetable farming<br>Microfinance, small business | Borehole<br>Keeping local chickens<br>Keeping hybrid cows/goats for milk |
| **Ipililo** | Sewing machine<br>Fish farming<br>Microfinance, small business | Sewing machine<br>Microfinance, small business<br>Vegetable farming |
| **Mwangholo** | Borehole<br>Vegetable farming<br>Microfinance, small business | Microfinance, small business<br>Borehole<br>Sewing machines |
| **Zebeya** | Irrigation agriculture | Poultry<br>Goat husbandry<br>Cows for milk |

The recommended activities did not vary significantly between gender focus groups. The most frequently mentioned activities include microfinance for small business, fish and vegetable farming, sewing machine, and borehole.

Asset ownership, a proxy indicator of a household's socioeconomic status, was polled. When households were asked about ownership of durable goods such as hoes, ploughs, mobile phones, radios or bicycles, the most common items owned are hoes, lanterns, chairs, and beds; on average, more than 70% households in this district own these durable goods. Also, in Hinduki, 70% of households surveyed own bicycles, and almost 50% own cell phone. Among the villages, average ownership of bicycles was 62%, radios 39%, and mobile phones 40%.

**Table 2: Ownership of Bicycle, Radio, and Cell Phone, by Village**

| Village | Bicycle | Radio | Cell Phone |
|---|---|---|---|
| Hinduki | 70% | 45% | 48% |
| Ipililo | 63% | 42% | 41% |
| Mwangholo | 57% | 33% | 30% |

| | | | |
|---|---|---|---|
| Zebeya | 60% | 35% | 42% |
| **Average ownership** | **62%** | **39%** | **40%** |

The WVP has also created a "wealth index" based on 30 household assets including items such as roof type and radio ownership but excluding livestock. The variation in scores across the four villages is relatively high: 2.58 for Mwang'holo, 3.18 for Hinduki, 3.29 for Zebeya and 3.51 for Ipililo. Across the 48 villages surveyed by WVP to date, these villages fall into the higher half of villages for overall assets (except Mwang'holo).

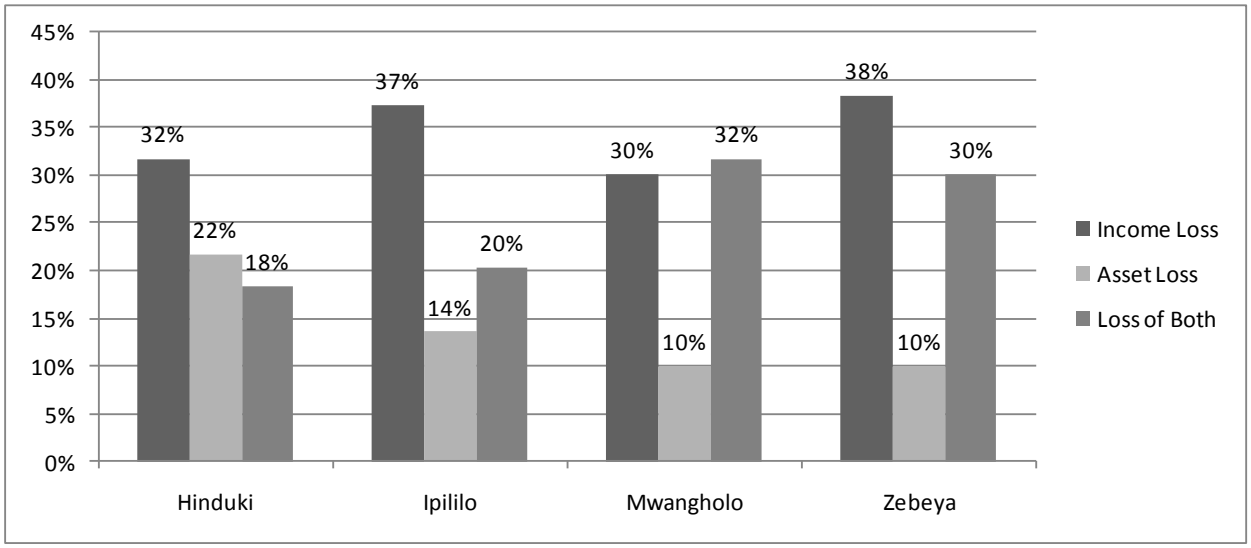
The vast majority of houses surveyed in Maswa District were built with natural materials, with walls made of mud bricks and floors made of earth or clay. There is a significant gap considering roof type among villages in Maswa district. In Ipililo, 71% of the roofs were made of corrugated metal, while in Hinduki and Mwang'holo; the majority (67% in Hinduki and 70% in Mwang'holo) of the roofs are made of natural material, including mud/straw/poles and grass/palm thatch. In Zebeya, half of the households surveyed chose to use corrugated metal.

## 4.2 Unexpected Loss of Income or Assets

In a given year, a household may experience unanticipated crises such as the death of a family member, the loss of a job or the loss of crops or livestock. Some families or households are able to cope with these losses better than others.

77% to 90% of households in these villages reported unexpected loss in the past year. The highest happened in Zebeya village, while even in Hinduki, more than 3 in 4 households reported unexpected loss. The most common unexpected losses were a substantial loss of crops due to weather (drought, flooding, etc) and crop diseases or crop pests. On average, 54% and 40% households in the four villages suffered from the above losses, respectively. Crops lost due to weather were a very serious problem in Zebeya; 68% of households reported unexpected loss due to this reason. Other severe losses included livestock which died, a large fall in the sale prices for crops, and a large rise in the price of food.

**Figure 2. Impact of Unexpected Loss**




As demonstrated in Figure 2, unexpected losses result in a significant setback to stability within both households and the villages themselves. 32% of respondents in Zebeya reported both income and asset loss; even in Hinduki which had the least impact, almost 1 out of 5 households experienced both income and asset loss.

## 4.3 Village Institutions

Table 2 presents a picture of the institutional analysis conducted in the villages surveyed in Maswa District. Village institutions and services are categorized according to the following types: village-run, village committee or group, and operated by third party. The sector column indicates the type of service or resource that the institution provides. The sector of an institution provides a general description of services provided; however, such descriptions are not exhaustive nor do organizations necessarily provide the same services to different villages.

## Table 3. Institutional Resources by Village

| Institution | Hinduki | Ipililo | Mwang'holo | Zebeya | Sector |
|---|---|---|---|---|---|
| Village-Run | | | | | |
| Community Health Worker | | | X | | Health |
| Community Animal Health Worker | X | | | | Animal Health |
| Court of Law | | X | | X | legal/law enforcement |
| Education | X | X | X | X | Education |
| Health Service | | | | X | Health |
| Religious Institution (church, mosque, etc.) | X | X | X | X | Aid/development, food/hunger, human development, social welfare |
| Veterinary Services | X | X | | | Health, wildlife/conservation |
| Village Council | X | X | X | X | Politics/government |
| Village Market | | | X | X | Business development |
| Community/publicly owned water | X | X | X | | Water/civil service |
| Sub-total Village-Run | 6 | 6 | 6 | 6 | |
| Village Committee/Group | | | | | |
| Environment/Natural Resources Cmte | | X | | | Energy/environment, farming/agriculture |
| Ag & Livestock Cmte | | X | | | Farming/agriculture |
| Farmers Coop/Ag Assn | | X | X | | farming/agriculture |
| Security Cmte | X | X | X | X | legal/law enforcement, |
| Community Development/ Planning/ Financial Cmte | | X | X | X | social welfare |
| Sub-total Village Committee/Group | 1 | 5 | 3 | 2 | |
| Third-Party Operated | | | | | |
| Cargill | | | X | | Agriculture |
| CRS | | X | X | | Aid/development |
| CARE | | X | X | X | |
| CBO | | X | | | |
| DADP | X | | | | |
| GAKI | | | X | | |
| ICF | X | | | | farming/agriculture |
| OXFAM | X | | | | aid/development |
| SACCOS | | X | X | X | financial/socioeconomic |
| SUNGUSUNGU | | | | X | legal/law enforcement |
| TASAF | X | | | X | |
| TTCL | X | | | | telecommunications/ technology |
| Togo | X | | | | telecommunications/ technology |
| World Vision | X | X | X | X | social welfare |
| Zantel | X | | | | telecommunications/ technology |
| Sub-total Third Party | 8 | 5 | 6 | 5 | |
| TOTAL | 15 | 16 | 15 | 13 | |

Although these tallies only give a glimpse of the types of services available in each village, they do indicate the relative level of activity by type of service providers and sector. The gap among the total number of institutions in the four villages is not significant; however, the number of village

committee/group and third-party institutions is quite different. Hinduki has the lowest number of village committee/group but the highest of third party institutions, while Ipililo is the highest in the former and lowest in the latter. All four villages have the same number of village-run institutions, six.

## 4.4 Education

### 4.1.1 Household-Head Education

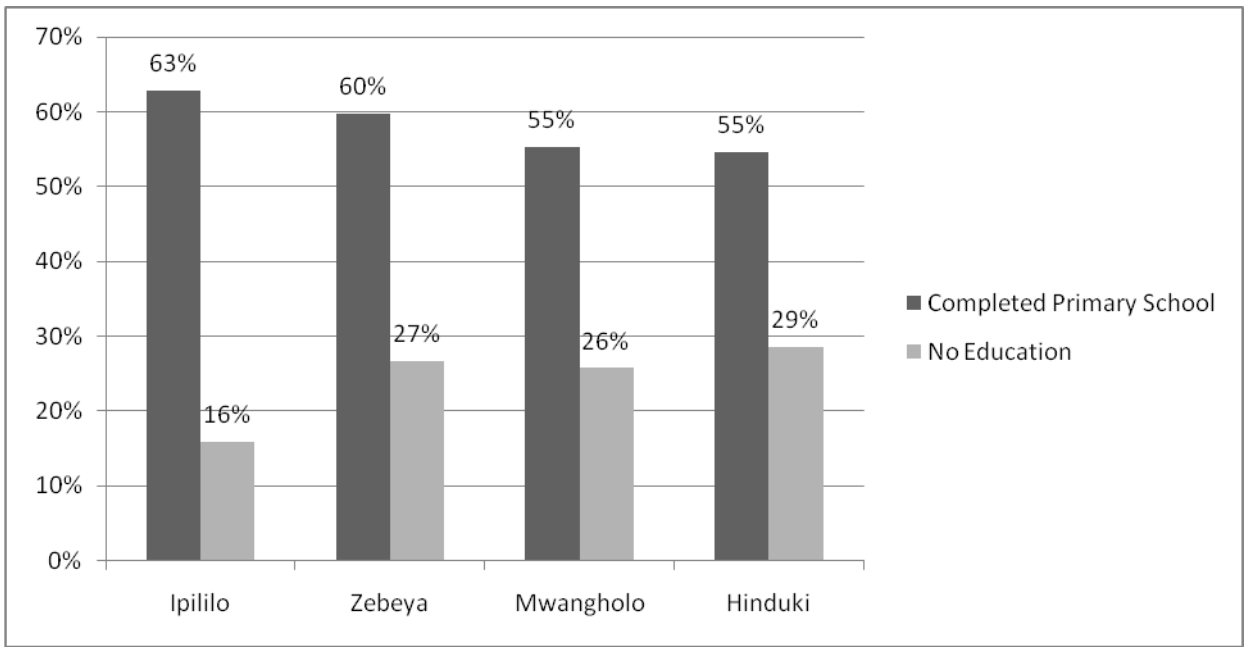
Among household heads in these four villages, proportions of primary school completions are in the range of 36% to 52%; Zebeya had the highest rate at 52% while only 36% in Mwang'holo (see Figure 3). Also, the gap among villages in the proportions of household heads with no education is high too: while it is as low as 17.5% in Ipililo, all the other three villages exceeded 34%. There were seven people who went to secondary school but did not complete in this district; there was only one person in Zebeya who completed secondary school. Other types of education, such as adult or vocational education, were low.

There was a sharp education contrast between male and female household heads in Maswa district, especially in Hinduki and Ipililo. Primary school completion rates were 57.5% and 56.8% of male household heads for Hinduki and Ipililo while the rates for female were only 18.2% and 23.1%, respectively. The percentage variants may be attributed to the low number of respondents.

### 4.1.2 Primary School Completion

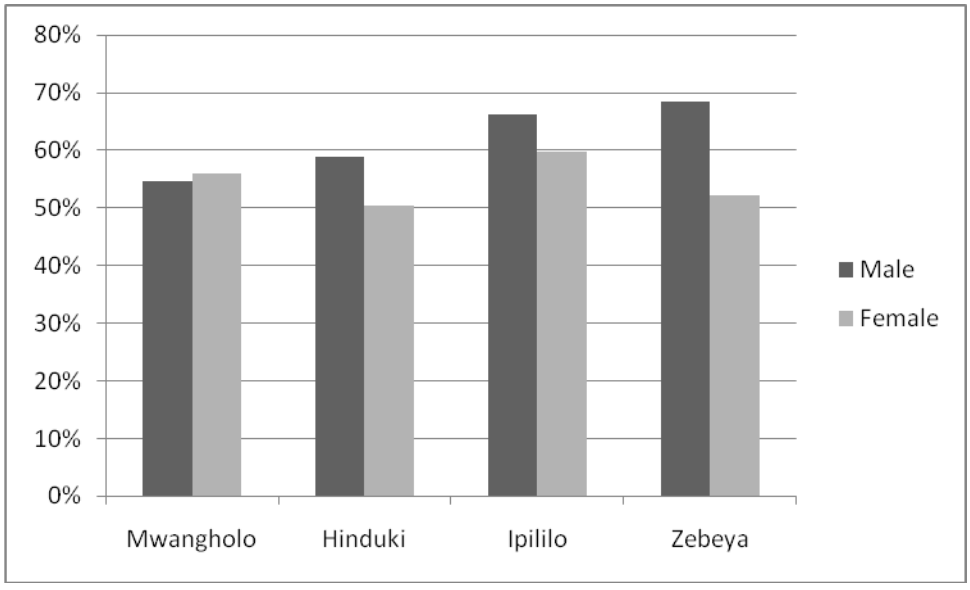
We also assessed the primary school completion rate for all adults (age 15 and over) and saw slightly higher rates of primary school completion as compared to household heads (see Figure 3).

**Figure 3. Percent Adults Completed Primary School versus No Education**




Between 16% to 29% of the adults in this district have had no education with the percentage twice as high for women as men except in Mwang'holo. However, the gap of primary school completion rates between male and female is not very high. As shown in Figure 4, except in Mwang'holo where female primary school completion rate is slightly higher than male, the rates for female were 6% to 15% lower than male in other villages.

**Figure 4. Adult Primary School Completion Rates, Disaggregated by Sex**



As with other education figures, all the villages have a low percentage of adults with at least some secondary education, but even in the highest village Zebeya, the proportion is still as low as 10%. There was only one person in Zebeya surveyed who had completed secondary school. In Ipililo and Zebeya, twice as many boys attend secondary school as girls Both schools need to work harder at retaining female students.

### 4.1.3 Access to Primary Education

There were two primary schools in the villages of Hinduki and Ipililo and one each in Zebeya and Mwang'holo; all the villages except Mwang'holo had one secondary school. Access to primary education is not only measured by presence of a primary school, but also by resources – teachers, classrooms, textbooks – available at that primary school. Data presented in Table 3 were compiled from questionnaires completed during interviews with school headmasters.

**Table 4. Primary School Environment**

| Village | Students Enrolled | Teacher to Student Ratio | Classroom to Student Ratio | Textbook to Student Ratio | % Teachers completed Form IV |
|---|---|---|---|---|---|
| Hinduki | 804 | 1 : 67 | 1 : 67 | 1 : 7 | 100% |
| Ipililo | 1877 | 1 : 70 | 1 : 78 | 1 : 10 | 78% |
| Mwang'holo | 617 | 1 : 88 | 1 : 88 | 1 : 3 | 86% |
| Zebeya | 858 | 1 : 107 | 1: 86 | 1 : 10 | 100% |

A shortage of classrooms/studying facilities and teachers and staff/student housing are noted by school headmasters and male and female focus group discussion participants as the greatest weaknesses of the primary schools in their villages. As supported by the data presented in Table 3, in general, the primary schools in Maswa District have poor teacher-to-student ratios, (especially in Zebeya the ratio is 1:107), classroom-to-student ratios (in Mwang'holo and Zebeya, over 80 students need to use one classroom), and textbook-to-student ratios.

Another measure of access is regular school attendance. Attendance rates of primary school in this district are in the range of 70% to 80%. In Zebeya, girls' attendance rates were consistently lower compared to the other villages.

Access to a quality primary school education is further affected by the physical condition of the learning child. Children who attend school hungry are less likely to be able to learn. The primary schools of Hinduki, Ipililo, and Mwang'holo have a vast majority of students coming to school

hungry (see Table 4); in Zebeya, however, no student went to school hungry according to the headmaster. In Hinduki, Hinduki Primary School did not provide any meal during the day; but Mwafa Primary School provided porridge as breakfast at a cost of 400 Tsh. In Zebeya, lunch was offered by the primary school; however, it would cost 9000 Tsh and is was served to standard 7 only.

**Table 5. Percent of Students Attending Primary School Hungry**

| Village | % Students Attending School Without Eating Food or Having Tea Only | School Meals Provided |
|---|---|---|
| Hinduki | 95%, 100% | No; breakfast, porridge at a cost of 400 Tsh |
| Ipililo | 90%, NA | None |
| Mwangholo | 81% | None |
| Zebeya | 0% | Lunch (porridge), 9000Tsh, served to Std 7 only |

## 4. 5 Health

### 4.5.1 Access to Health Services

Access to health services is central to the delivery of prevention and care services and health outcomes. Here we consider service availability and service quality as a measure of "access." Service availability can include distance or time required to reach the facility (or trained health providers), hours of operation, appropriate personnel on-staff, and necessary equipment to run laboratory tests; service quality may address proper staff training and appropriate treatment (and availability of commodities) according to established guidelines.

Qualitative information on the problems facing villages in Maswa District was collected through focus group discussions with men and women and clinic officer interviews. In all villages assessed, respondents ranked malaria as the number one ranked health issue facing men, women, and children (see Table 5). Other issues for adults included stomach and feet aches, and HIV/AIDS. For children, diarrhea and malnutrition were also mentioned by parents as disease of primary concern.

**Table 6. Top Ranked Health Issues for Men, Women, and Children**

| Village | Men's Health | Women's Health | Children's Health |
|---|---|---|---|
| Hinduki | 1. Malaria<br>2. Stomach Aches<br>3. Urinary Tract Blockage<br>4. Hernias | 1. Malaria<br>2. Stomach Aches<br>3. Cervical Cancer<br>4. Swollen Legs<br>5. Typhoid | 1. Malaria<br>2. Stomach Aches<br>3. Diarrhea |
| Ipililo | 1. Malaria<br>2. HIV/AIDS<br>3. Hernia<br>4. Tuberculosis | 1. Malaria<br>2. HIV/AIDS<br>3. Feet Pain | 1. Malaria<br>2. Measles<br>3. Skin Diseases |

| | | | |
|---|---|---|---|
| | | 4. Cancer | |
| Mwangholo | 1. Malaria<br>2. Influenza<br>3. Impotence | 1. Malaria<br>2. Foot Aches<br>3. Prolonged Menstrual Cramps | 1. Malaria<br>2. Poor Nutrition<br>3. Diarrhea/Vomiting |
| Zebaya | 1. Malaria<br>2. Diabetes<br>3. Urinary Failure<br>4. Hernias<br>5. AIDS | 1. Malaria<br>2. Foot Aches<br>3. Headaches<br>4. Ulcers | 1. Malaria<br>2. Diarrhea<br>3. Typhoid<br>4. Malnutrition<br>5. Convulsions |

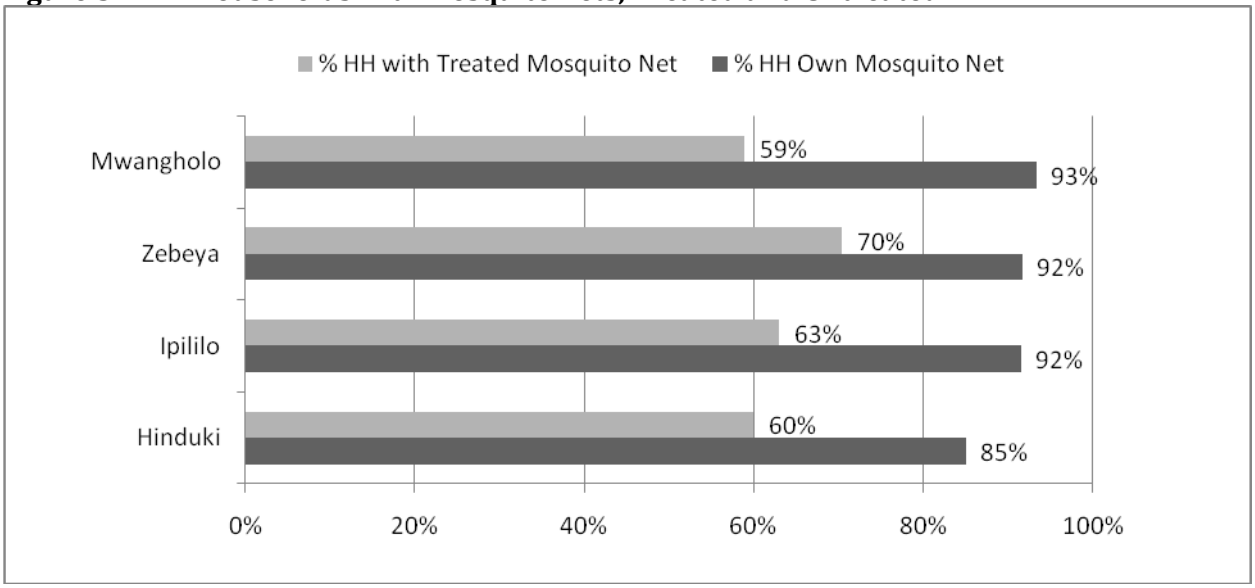
In Maswa District, only Ipililo and Zebeya have dispensaries. The dispensary in Zebeya is staffed by one medical officer and one assistant medical officer while Ipililo has an assistant medical officer, one nurse and one nurse assistant. Both dispensaries have one refrigerator each. These two villages both offer maternal/child health and family planning services.

The Focus Group surveys indicate that except that people in Mwang'holo go to clinic/dispensary/hospital for all sorts of diseases, there is a mixture of clinic and traditional healer in the other three villages.

### 4.5.2 Malaria and Other Illnesses

Given the prevalence of malaria, all households are asked if they own at least one mosquito net and if it has been treated with insecticide. Figure 5 presents data by village on percentage of households owning a mosquito net insecticide treatment. Overall, all villages have high rates of mosquito net ownership with Mwang'holo, Zebeya, and Hinduki having the ownership rate over 90%; approximately 60-70% of household have insecticide treated nets. If consistent mosquito net use is practiced by household members, they should begin to see their malaria rates decrease as well.

**Figure 5. Households with Mosquito Nets, Treated and Untreated**




Although malaria was the most frequently identified health problem by participants in male and female focus group discussions (FGDs) other health problems were also mentioned as concerns. These included: AIDS, foot and stomach diseases, hernias, typhoid, headaches, diarrhea, diabetes, and impotence (for men). The Health Officers in Ipililo and Zebeya villages noted that the most common symptoms treated in the village over the past 12 months for adults were fever, coughing, pains while urinating, and dysentery. Also, the health officer in Zebeya expressed concern about the lack of HIV/AIDS knowledge, insufficient medicinal supply, and a general problem with hygiene and sanitation.

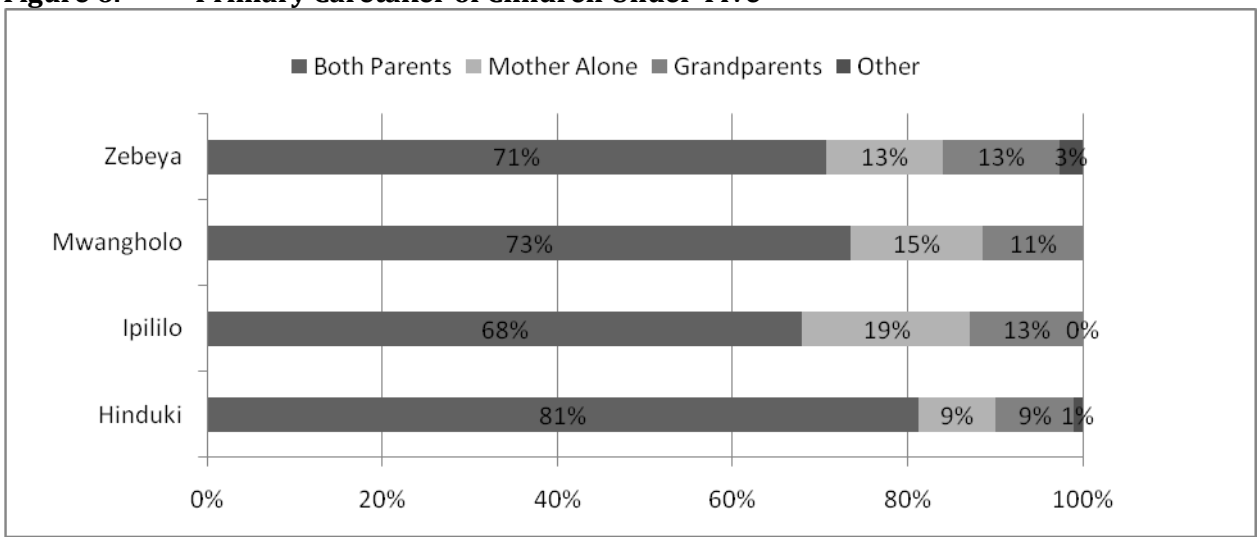
### 4.5.3 Under-Five Health Status

The health status of children under five is critical to their future physical, mental and emotional quality of life as well as expected mortality. In order to assess the quality of children's health at this age we inquire about primary caretakers, exclusive breastfeeding as an infant, primary food eaten, vaccines, and experience with disease. In addition, the field team weighs and measure the height of children to determine how close they are to a normal growth curve and if they are over or undernourished.

The morbidity and mortality of children under five years can be correlated to the presence or absence of biological parents, especially the biological mother. 88-95% of mothers (304 in total) of children under 5 in the four villages are alive and in the household. Six mothers have died and 23 are alive but not living in the household. 18 out of 278 households had lost the natural father. Mwang'holo has the lowest percentage of households with the father alive and living in the

household, 67% while the highest in Hinduki is 80%. There was a high percentage of households with the father alive but not living in the household; the highest is Ipililo and Zebeya, roughly 25%. Figure 6 indicates that childcare is mostly shared among parents and grandparents. No household has a father alone as the primary caretaker of the children.

**Figure 6. Primary Caretaker of Children Under-Five**




In the villages surveyed, approximately 13-20% of children under five are considered frequently sick. 15 children less than five years old died in the last 2 years.

**Figure 7. Percent Children Under-5 Who Have Had a Disease in the Past 3 Months**

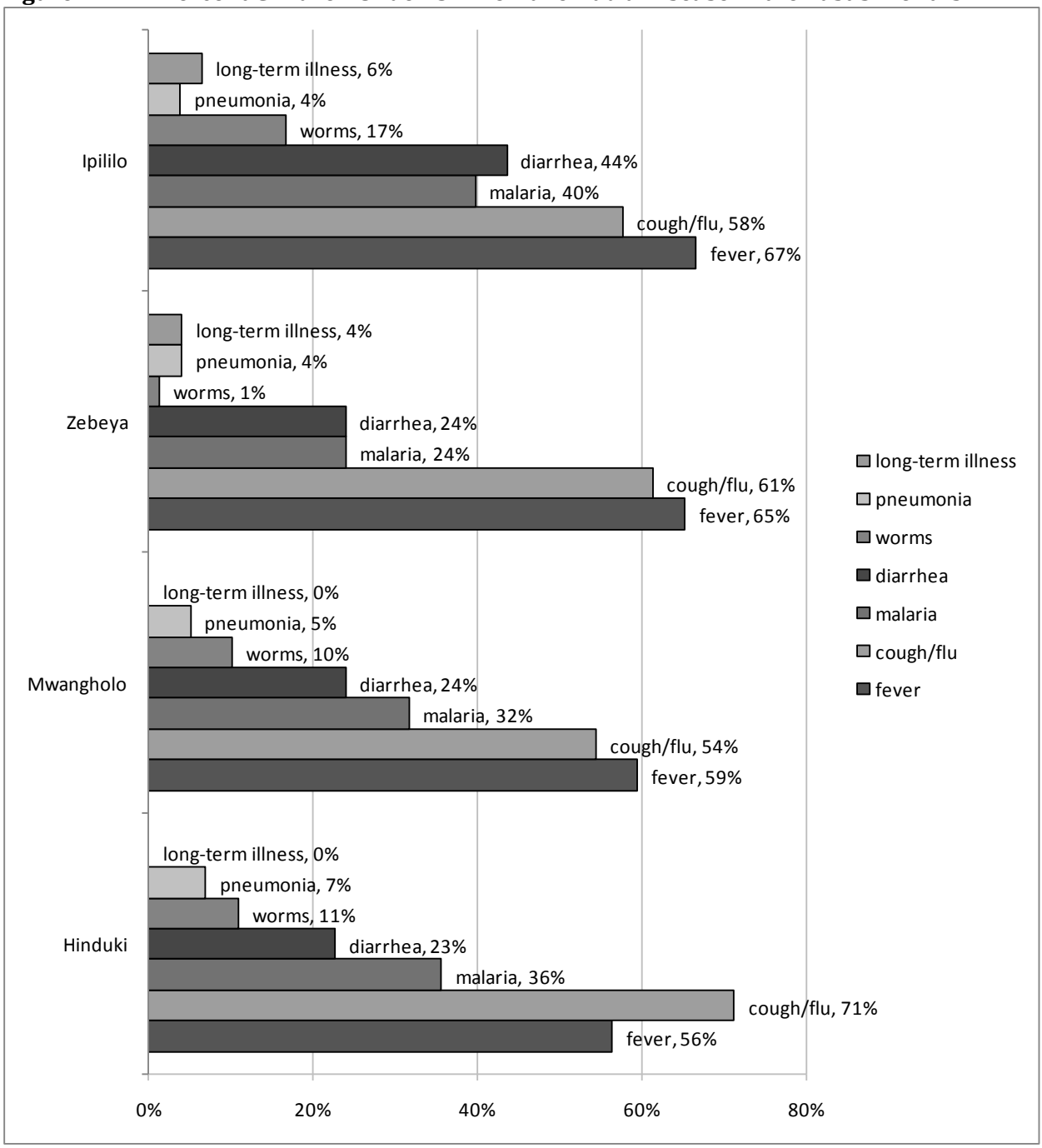
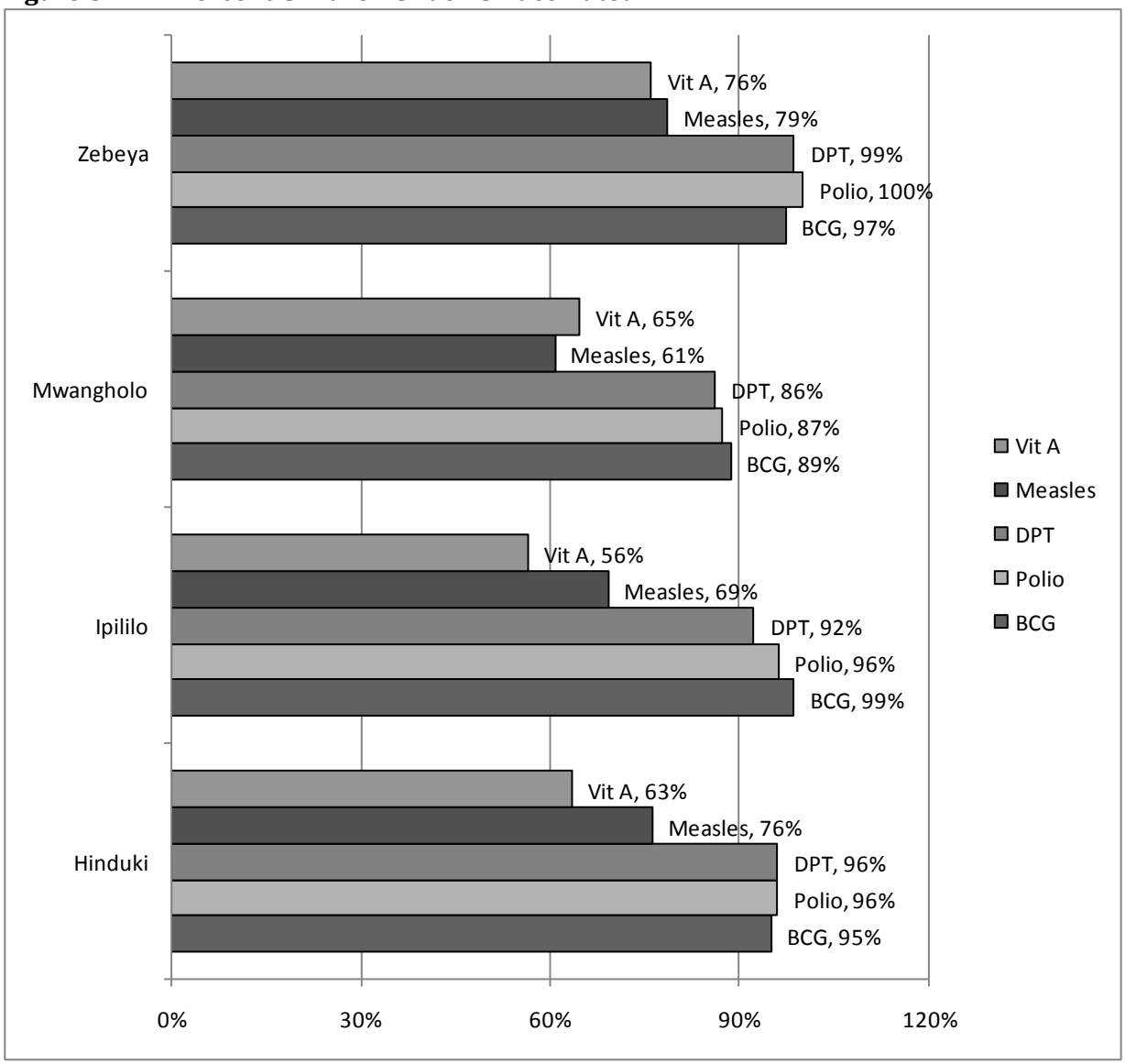



Figure 7 gives a picture of the disease burden for children under-five in these villages in the past three months. The most commonly reported illnesses in the past three months were fever (55% to 67% of children under 5), cough or flu (71% to 54%), malaria (24% to 40%) and diarrhea (23% to 44%). The incidence of pneumonia and long-term illness in children under five was relatively low among these villages. The proportion of children under-five who suffered from worms had a big gap: the lowest happened in Zebeya (1%), while 17% of kids surveyed in Ipililo reported the incidence of worms in the past three months.

According to World Health Organization (WHO) guidelines, children are considered fully vaccinated when they have received a vaccination against tuberculosis (BCG), three doses each of the DPT and polio vaccines, and a measles vaccination by the age of 12 months. Figure 8 shows the percentage of children under five who have been vaccinated by village; data were also collected on percentage of children under five who had received a vitamin A supplement.

**Figure 8. Percent Children Under-5 Vaccinated**



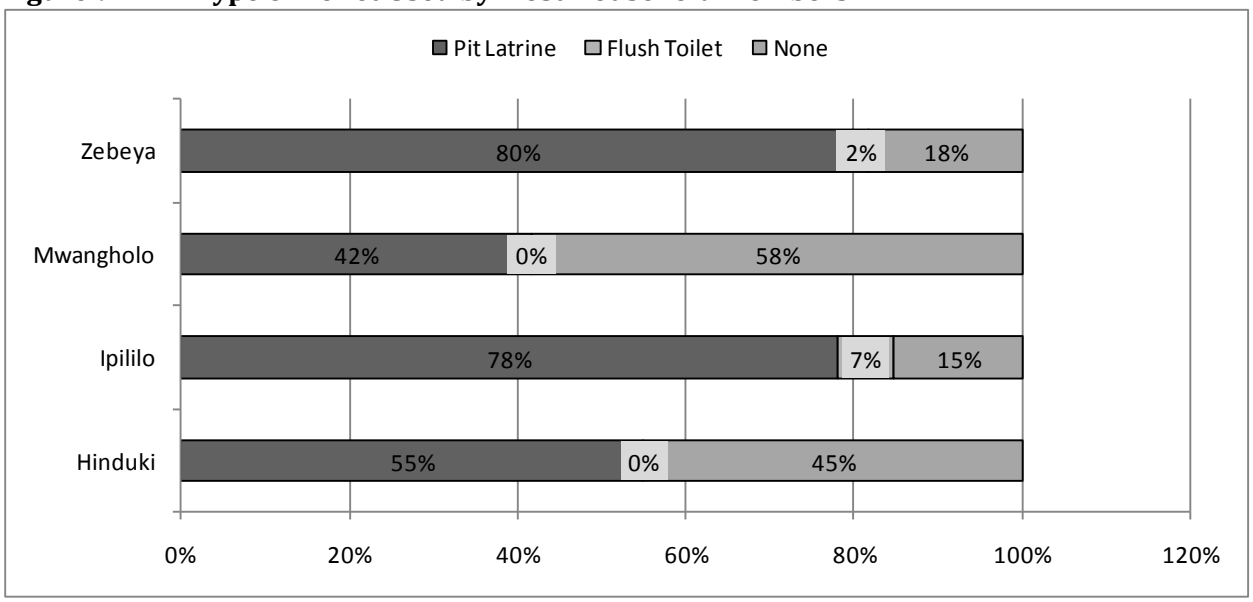

Except in Mwang'holo, Over 92% of children under-five in Maswa district have received a DPT, BCG, or polio vaccine; the vaccination rates in Mwang'holo were in the range of 86% to 89%. Among all recommended vaccines, measles vaccination rates (61-79%) were the lowest within each village surveyed; Mwang'holo also had the lowest measles vaccination rate. Vitamin A supplements rates were in the range of 56% to 76%. The lower rates of measles vaccination and Vitamin A

supplements are a cause for serious concern. The data shown in Figure 8 do not take into account age at vaccination or number of doses, so a determination of whether or not children are fully vaccinated is not possible.

### 4.5.4 Environmental Health

Many infectious diseases, especially diarrheal diseases, can be a result of poor hygiene and contaminated water and food sources. In general, villages surveyed in Maswa district had low rates of latrine coverage, especially in Mwang'holo and Hinduki, the latrine coverage rates were only 42% and 55% respectively.

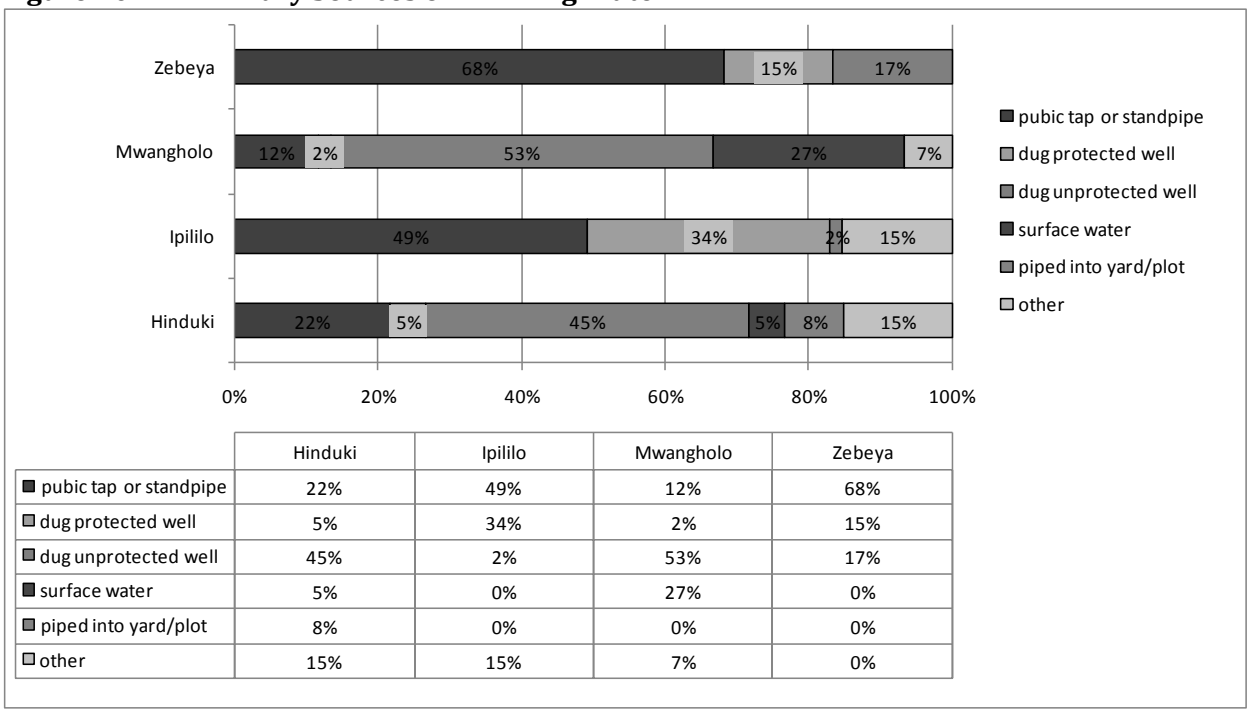
**Figure 9. Type of Toilet Used by Most Household Members**




Qualitative data indicates the primary mode of refuse disposal in Maswa District villages was to bury refuse on a compound; in Ipililo, indiscriminate disposal was a more common way.

The gap between the proportion of households with high and low access to protected drinking water was very significant. In Ipililo and Zebeya, 83% of households have access to protected water; however, the percentage in Hinduki was 35% and as low as 13% in Mwang'holo. As shown in Figure 10, sources of protected drinking water were generally public taps or a standpipe and protected well. The main reason for higher percentage of household with access to protected water sources in Zebeya and Ipililo is the relatively high coverage of public tap/standpipe. In Mwang'holo, unprotected well provided 53% of drinking water; and surface water also account for 27%.

**Figure 10. Primary Sources of Drinking Water**




| | Hinduki | Ipililo | Mwangholo | Zebeya |
|---|---|---|---|---|
| pubic tap or standpipe | 22% | 49% | 12% | 68% |
| dug protected well | 5% | 34% | 2% | 15% |
| dug unprotected well | 45% | 2% | 53% | 17% |
| surface water | 5% | 0% | 27% | 0% |
| piped into yard/plot | 8% | 0% | 0% | 0% |
| other | 15% | 15% | 7% | 0% |

Given the fact that the majority of households in Mwang'holo and Hinduki are drinking unprotected water, treating the water through boiling, a filter, bleach tablets or other means is important to protect the health of all family members. However, the percentage of households that were treating their water in some way was really low: 42% in Ipililo, 35% in Hinduki, 28% in Mwang'holo and Zebeya.

Table 6 shows the average amount of time households from each village spend collecting water. The total water collection time encompasses the time it takes a household member to get to the water source, collect the water, and return home. In addition to significant time required to collect water, access to drinking water is further limited by long distances. Residents in Hinduki have to travel 2-4 kilometers to access drinking water, and the water source is salty. In Zebeya, the distance is between 1km to 100km; the water quality is quite low: salty and muddy. In Mwangholo, people need to travel 2km to get clean water. Ipililo has the shortest distance to drinking water because they have bore-hole 0.25 km away; residents there also spend the shortest time to collect water.

**Table 7. Average Time to Collect Water**

| Village | Average minutes to collect |
|---|---|
| Hinduki | 66.12 |
| Ipililo | 40.69 |
| Mwang'holo | 67.90 |
| Zebeya | 68.17 |

Cooking fuel type and primary cooking location affect respiratory health, primarily of women and children. In addition, accidents around fires lead to more burns for women and children. The majority of households in all villages cook with wood (over 95%); the rest of the households use charcoal or coal lignite.

### 4.5.5 HIV/AIDS

In addition to the household survey, up to four adults were interviewed in each household on their Knowledge, Attitude and Practice (KAP) regarding HIV/AIDS. This section focuses exclusively on correct knowledge of HIV prevention data as collected through these KAP surveys. A more detailed report that includes additional data and analysis on HIV/AIDS knowledge, attitudes, and practices is available from Savannas Forever Tanzania (refer to Acknowledgements section for contact information).

This discussion on HIV knowledge examines the differences in knowledge level between men and women. As shown in Table 7, a higher percentage of women than men participated in the survey with 62% to 69% in these villages. Eligibility was defined as anyone 15 years or older living in the household. The main reason for this variance in response rate is that men were less likely to be present when the KAP survey was conducted.

**Table. 8 Sample Size of KAP Survey, by Sex**

| | Sample size | | |
|---|---|---|---|
| | Male (%) | Female (%) | Total |
| Hinduki | 40 (37%) | 69 (63%) | 109 |
| Ipililo | 33 (31%) | 72 (69%) | 105 |
| Mwang'holo | 35 (38%) | 57 (62%) | 92 |
| Zebeya | 37 (33%) | 75 (67%) | 112 |

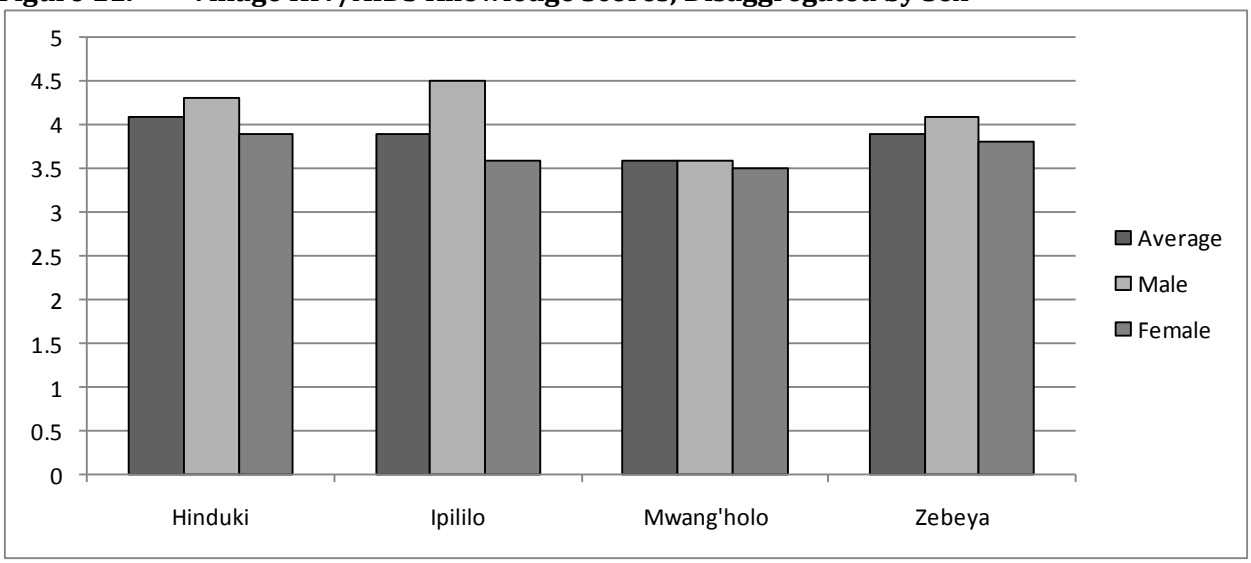
To assess an individual's correct knowledge of HIV/AIDS, the KAP survey asks six questions:

1. Can people reduce their chances of getting the HIV/AIDS virus by having just one sex partner who has no other partners? yes

2. Can people get the HIV/AIDS virus from mosquito bites? no
3. Can people reduce their chances of getting HIV/AIDS by using a condom every time they have sex? yes
4. Can people get the HIV/AIDS virus by sharing food with a person who has HIV/AIDS? no
5. Is it possible for a healthy looking person to have HIV/AIDS? yes
6. Can HIV/AIDS be transmitted from mother to child? yes

Correct responses to the six questions are added together to compute a composite HIV/AIDS knowledge score, which can range from 0 (no correct answers) to 6 (all correct answers). Village and sex differences in average HIV/AIDS knowledge scores are summarized in Figure 11.

**Figure 11. Village HIV/AIDS Knowledge Scores, Disaggregated by Sex**

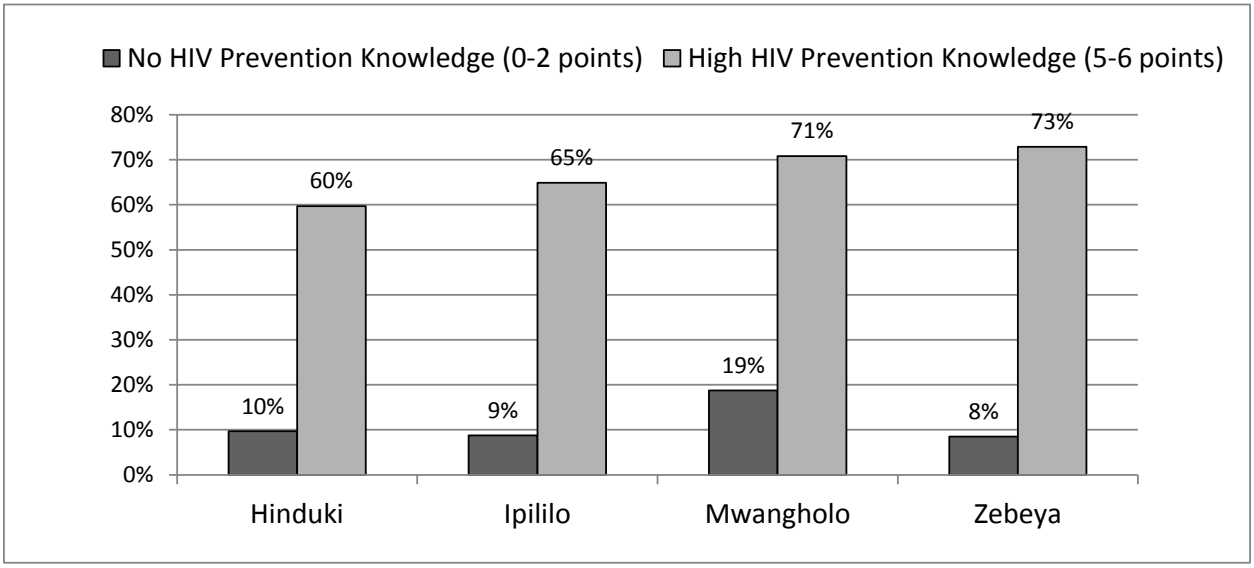



Hinduki has a slightly higher average HIV/AIDS knowledge score (average 4.1), while Mwang'holo is the lowest with average score of 3.6. The female knowledge score is relatively close in the four villages, from 3.5 to 3.9. The greater variance is among the male's knowledge scores: from 3.6 to 4.5. In all villages surveyed, the women's average knowledge score is lower than the men's.

The skip pattern of the KAP questionnaire means that individuals who say they have not heard of HIV/AIDS do not answer any of the six questions, and individuals who say they do not know of any ways to prevent HIV infection do not answer the first four questions, which concern prevention. Since the responses that trigger these skip patterns imply lack of knowledge, skipped questions earn zero points. Therefore, those who say they have not heard of HIV/AIDS get a score of zero, while those who have heard of HIV/AIDS but report no knowledge of prevention measures receive a score between 0 and 2 based on their answers to questions numbers 5 and 6. As shown in Figure

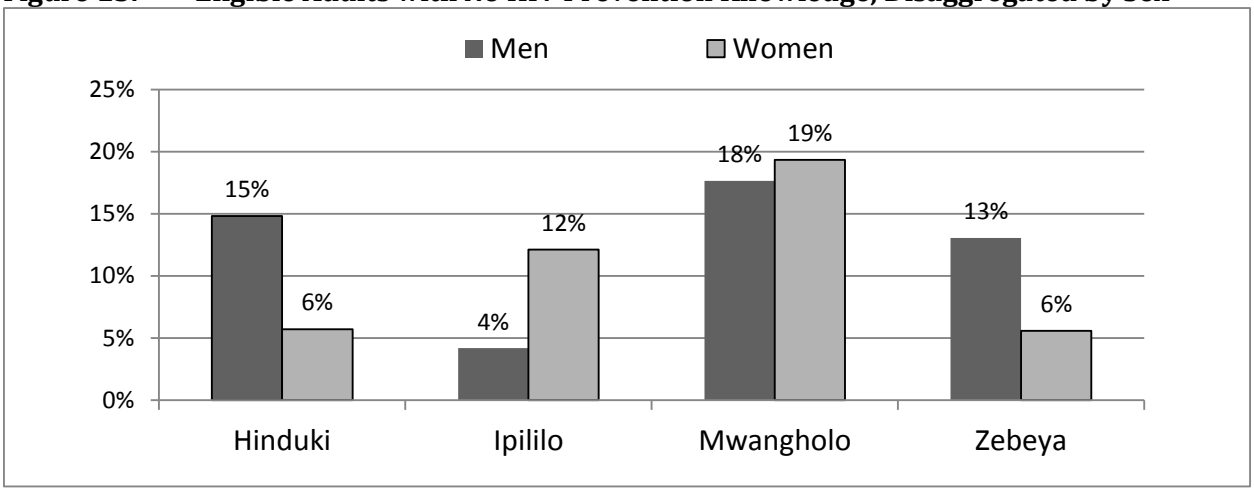
12, 73% of eligible adults in Zebeya, which is the highest, have high knowledge of HIV and its prevention. The proportion of high HIV knowledge score is over 60% in all villages. The greatest percentage of adults with no HIV prevention knowledge is in Mwang'holo (19%) although it has the second highest percentage of high HIV score.

**Figure 12. Percent Eligible Adults with No versus High HIV Prevention Knowledge**




As shown in Figure 13, the proportion of women with no HIV prevention knowledge is higher than men in Ipililo and Mwang'holo. In Hinduki and Zebeya, however, the percentage of men without HIV knowledge is significantly higher.

**Figure 13. Eligible Adults with No HIV Prevention Knowledge, Disaggregated by Sex**



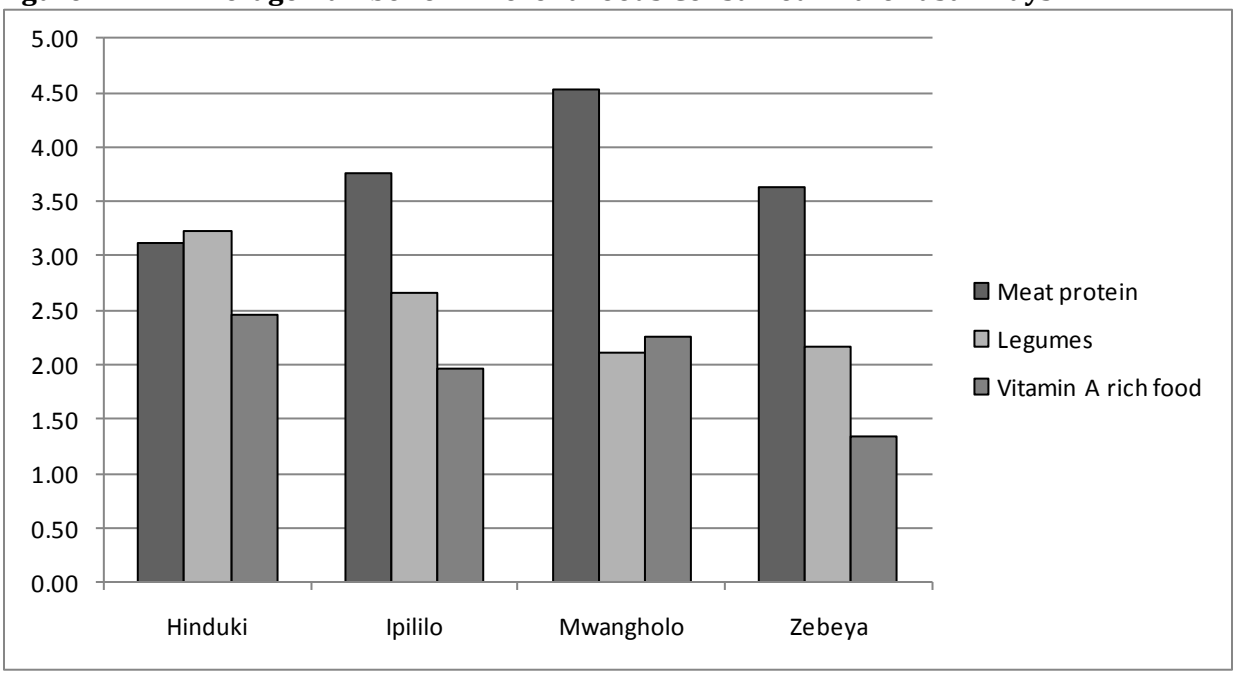

We also ask men and women if they have ever been tested for HIV. The response rates are different from village to village; but the response rate from men was not significantly higher than women. More people at Ipililo have tested for HIV (62%) and the lowest is in Hinduki, 40%. In Hinduki and Zebeya, the proportion of males who have tested for HIV is lower than females (35% and 51% for males, 43% and 55% for females).

## 4.6 Nutrition and Food Security

### 4.5.6 Household Nutrition

Diversity of daily diets and consistent intake of recommended vitamins and nutrients is limited. On average, household ate a variety of 5.8 to 6.3 (Zebeya is the lowest with 5.8, the rest villages are all the in range of 6.2 to 6.3) types of different foods in a week. In Mwang'holo, households eat more meat protein than other villages, but less legumes. Zebeya has similar meat protein and legumes consumption level as other villages, but vitamin A rich food eaten is the lowest as shown in Figure 14.

**Figure 14. Average Number of Different Foods Consumed in the Last 7 Days**



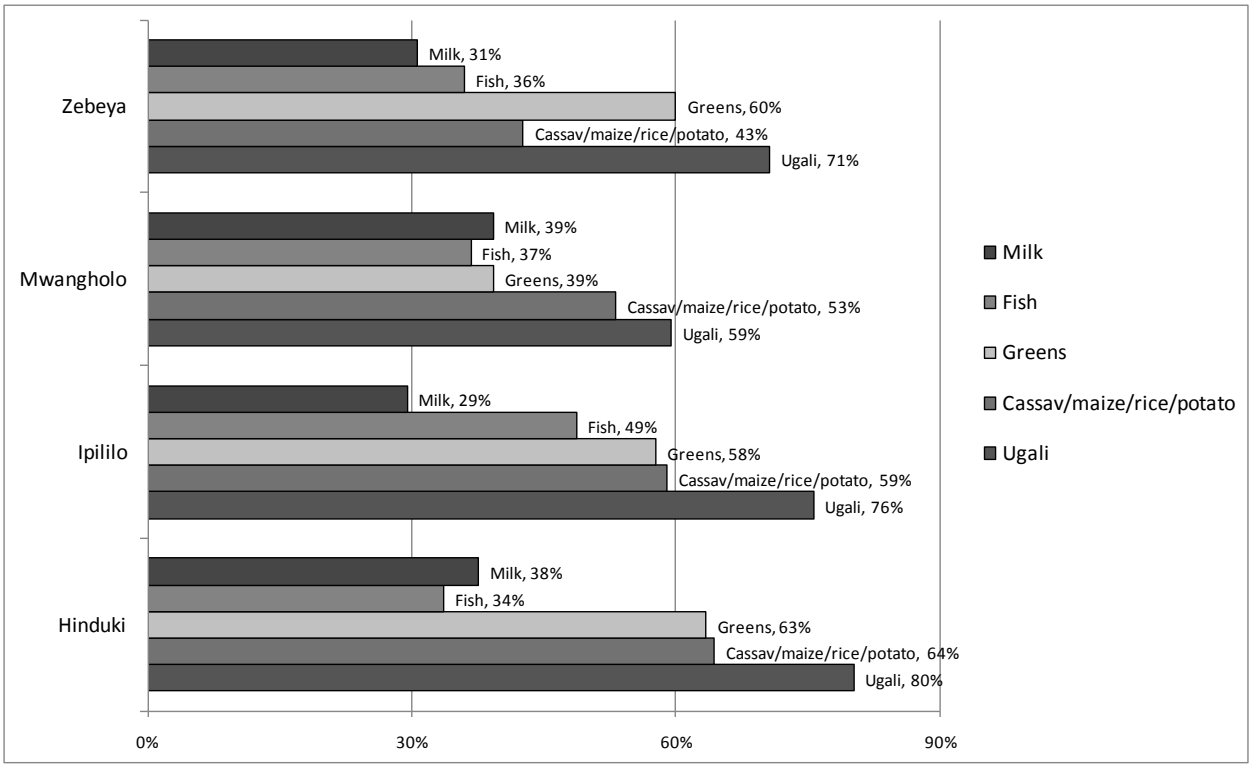

### 4.5.7 Infant and Young Child Feeding

Optimal infant and young child (age 6-23 months) feeding practices (IYCF) include: early initiation of breastfeeding, exclusive breastfeeding during the first 6 months, continued breastfeeding for up to two years and beyond, timely introduction of complementary feeding at 6 months, frequency of feeding solid/semisolid foods, and the diversity of food groups fed to children 6-23 months. Almost all the babies and children were breastfeed in Maswa district (except kid surveyed in Mwang'holo). On average, 38% to 40% of kids surveyed were exclusively breastfed equal to or less than 3 months. 41% to 56% of kids were exclusively breastfed for 3 to 6 months.

### 4.5.8 Under-Five Nutrition

The most commonly eaten foods by children under five in the last 24 hours in households surveyed are listed in Figure 15.

**Figure 15. Percent Children Under-5 Eating Food Item in Last 24 Hours**



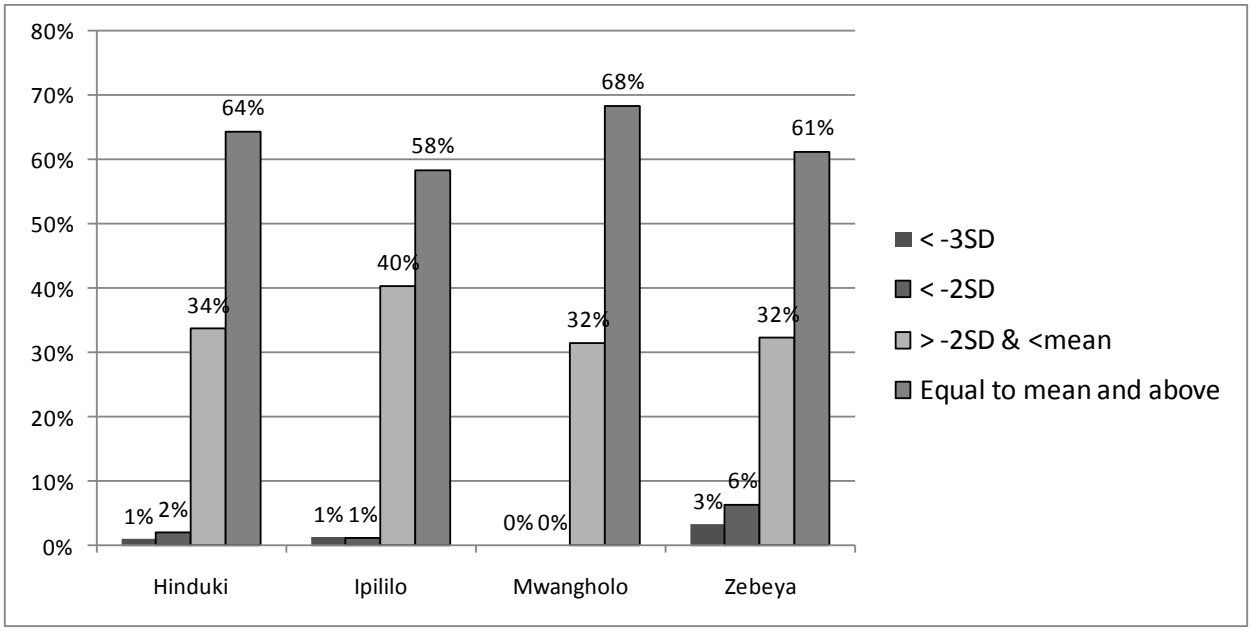

Ugali was the most commonly consumed food by children under five in the last 24 hours in all four villages, in a range of 59% to 80%. Carbohydrate is the second most commonly consumed foods. The milk and fish consumption in these four villages is relatively high: it is around 30% to 50%. However, meat consumption is low: in most villages, the consumption of beef, lamb, and chicken is lower than 15%. Also, fruit consumption is very low too. The proportion of kids who had any kind of fruit in Hinduki, Mwang'holo, and Zebeya is lower than 10% (except that in Mwang'holo, 11% of kids surveyed had papaya in the last 24 hours). In Ipililo, fruit consumption is a lot higher: around 20% of the kids had banana, papaya, and orange in the last 24 hours.

Children under five are mostly likely to get protein from a non-meat source, specifically milk or fish. Similarly, greens were the most commonly eaten vegetable and the most commonly eaten fruits were banana and papaya.

The weight-for-height z-score describes current nutritional status and is based on a child's height and weight compared to international averages established by the World Health Organization (WHO). Children whose Z-scores are below two standard deviations (-2 SD) from the norm are considered moderately underweight, and those below three standard deviations (-3 SD) are considered severely underweight. According to the data collected in the survey of children under-

five (see Figure 16), nearly 1 in 10 children under five in Zebeya are moderately or severely underweight compared to 0 children underweight in Mwang'holo.

**Figure 16. Percent Children Under-5 Malnourished**




### 4.5.9 Food Security

A series of nine questions are used to create a food security scale. Sample questions include, have you gone a day and night without food in the past month; or have you had to eat a limited number of foods in the previous week or reduced how much you eat. The higher the food security score, the greater the average food insecurity experienced. Of the four villages surveyed in Maswa District, households in Mwang'holo and Ipililo were the most food secure with a mean index score of 3.12 and 3.37 compared to 3.70 and 3.77 in Zebeya and Hinduki.

Consistent with this finding, one can see in Table 8 that households in Hinduki and Zebeya worried about food more often than those in Ipililo and Mwang'holo. Also, Hinduki has the highest percent of household with limited food last week. 1 in 10 household in Zebeya went one day and night without food.

**Table 9. Percent of Households that Experienced Food Insecurity in Last 4 Weeks**

| | % of Households worried about food last week | % of Households ate limited foods last week | % of Households went one day and night without food |
|---|---|---|---|
| Hinduki | 40% | 93% | 5% |
| Ipililo | 27% | 86% | 2% |

| | % of Households worried about food last week | % of Households ate limited foods last week | % of Households went one day and night without food |
|---|---|---|---|
| Mwang'holo | 24% | 85% | 8% |
| Zebeya | 47% | 82% | 10% |

#### 4.5.10 Kitchen Gardens

Kitchen gardens are one means that households can help protect themselves from periods of food insecurity when there is general high crop or livestock loss. The percentage of households that were growing kitchen gardens was very low: Hinduki is the highest with 15% while the lowest in Mwang'holo was only 5%. The fact that there are more kitchen gardens in Hinduki is consistent with the higher food insecurity experienced there.

## 4. 7 Agriculture

Farmers in Maswa District are predominantly small-scale, subsistence farmers with a portion going towards cash crop production. The average acres cultivated were 6.9 to 8.1 acres. 48% to 72% of the households in these four villages cultivate 1 to 5 acres of land (48%, 72%, 50%, and 56% in Hinduki, Ipililo, Mwang'holo, and Zebeya). The gap in the percentages of households cultivating land bigger than 10 acres is big: only 10% of households in Hinduki while 25% in Zebeya. As shown in Table 9, Hinduki has the highest proportion of households that own land: 88%; however, the average acres owned is the lowest. Zebeya has the lowest percent of households that own land and highest percent that rent land.

**Table 10. Percent of Households that Own land and the Average Acres Owned and rent**

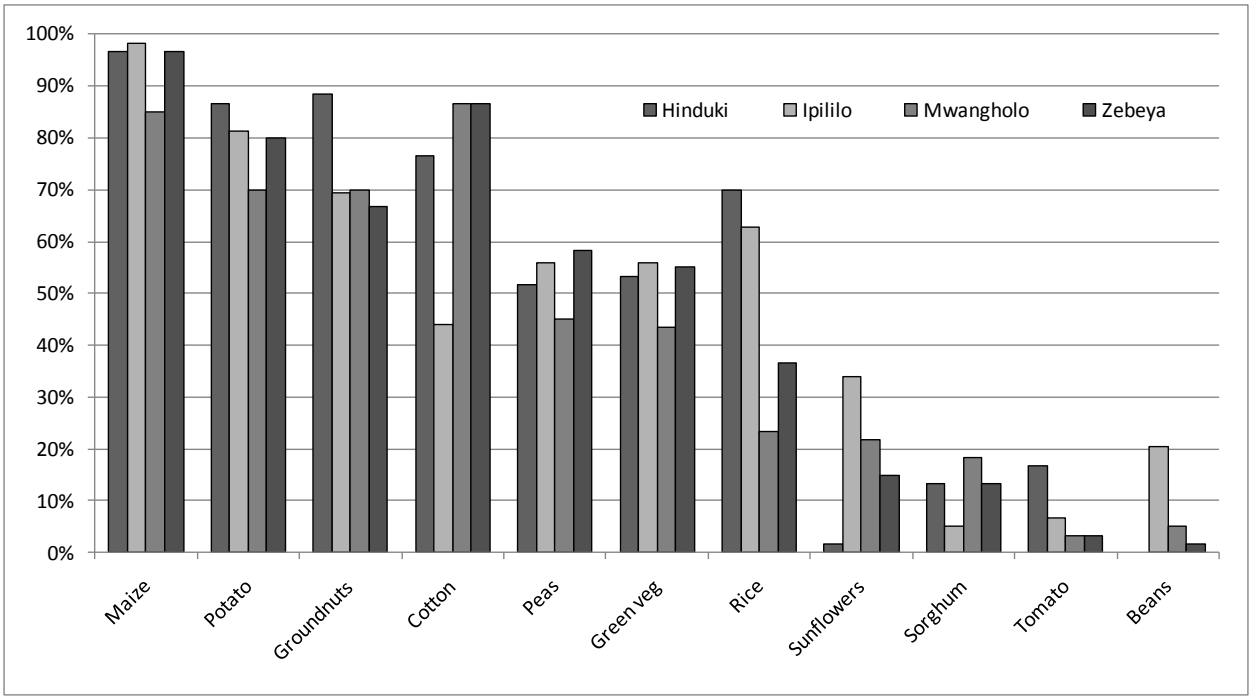
| | % of Households That Own Land | Average Acres Owned | % of Households That Rent Land | Average Acres Rent |
|---|---|---|---|---|
| Hinduki | 88% | 7.53 | 43% | 2.91 |
| Ipililo | 73% | 7.53 | 51% | 4.09 |
| Mwang'holo | 85% | 13.25 | 38% | 3.07 |
| Zebeya | 63% | 10.53 | 57% | 3.50 |

Most households grow a diversity of crops with mostly similar proportions among the four villages as shown in Figure 17. Maize is grown by over 95% of households (except Mwangholo) followed by potato (70-87%), groundnuts (67-88%) and cotton (44-87%). In Hinduki, people do not grow sunflowers and beans, but the percentages that grow groundnuts, rice, tomatoes and potatoes are

higher than other villages. The most commonly grown fruit is papaya; but still less than 10% of the households. Fewer than 2 households in each village were growing coconuts, bananas, or mangos.

Although similar crops are grown and sold among the surveyed villages, there are large variations in the prices of certain crops. For example, a sack of maize sold for 30,000 TSH in Hinduki compared to 21,000 TSH in Ipililo. A potential cause of the discrepancy, Ipililo and Zebeya report the nearest markets ware 10 kilometer distance, while 60 kilometers for Mwangholo. Also, Mwang'holo reports 5% proportion of crops left over from harvest compare to 50% in Zebeya.

**Figure 17. Percent Households Cultivating Various Crops by Village**




Focus group discussions (FGDs) were facilitated with top farmers (typically 4-6 farmers per village), as defined by village leaders, and agricultural extension officers (if applicable) to further assess the agricultural environment in each village. Qualitative data collected and analyzed from these FGDs are presented in Table 10.

**Table 11. Qualitative Data on District Agricultural Environment**

| Village | % HH that Irrigate Plot | % HH using Fertilizer: Inorganic | % HH using Fertilizer: Organic | % HH with Soil Erosion as Serious Problem |
|---|---|---|---|---|
| Hinduki | 0% | 20% | 75% | 50% |
| Ipililo | 10% | 10% | 30% | 10% |
| Mwang'holo | 0% | NA | 25% | 25% |
| Zebeya | 3% | 0.03 | 20% | -- |

Over 75% of the farmers in all villages indicated that they used intercropping; however, very low percentages of households (0% in Hinduki, 20% in Ipililo, and 20% in Zebeya) use terracing to control for erosion except Mwang'holo with 75% of the households doing that. In the past year, only Hinduki and Ipililo were visited by an agricultural extension worker.

## 4.8 Livestock

Overall, households in Hinduki and Mwang'holo own more livestock (e.g., cows, goats and chickens) than households in Ipililo and Zebeya (as shown in Table 11): generally, percentage of households who own livestock is higher in Hinduki and Mwang'holo; also, among households who own livestock, these two villages tend to have higher average numbers.

**Table 12. % of Households who Own Livestock and Mean Number Owned**

| | % of HH who own livestock | | | Average # of livestock owned among HH who own livestock | | |
|---|---|---|---|---|---|---|
| | % of HH in village who own Cattle | % of HH in village who own Sheep/Goats | % of HH in village who own Chickens | Cattle | Sheep/Goats | Chicken |
| Hinduki | 58% | 72% | 90% | 10.4 | 13.7 | 10.4 |
| Ipililo | 42% | 51% | 78% | 12.9 | 9.2 | 7.1 |
| Mwangholo | 52% | 70% | 88% | 14.7 | 15.0 | 9.0 |
| Zebeya | 53% | 62% | 82% | 10.9 | 10.8 | 6.6 |

In the agricultural focus groups, only cows in Ipililo were indicated vaccinated (70%). In addition, none of the goats are vaccinated. Further, villagers in Ipililo indicated that the vaccination administered was CBPP (Contagious bovine pleural pneumonia). Among the four villages, only Mwang'holo had the advantage of a community animal health worker in the village. Although Ipililo

was the only village which had vaccinated the cows, the percentage lost to disease (8%) was not significantly lower than other villages (9% in Hinduki, 13% in Mwang'holo, and 8% in Zebeya). Also, very few cattle were lost to drought (only 1% in Hinduki).

On the other hand, all villages experienced very high loss of chickens to disease: 43% to 54%. Newcastle Disease is the number one cause of chicken mortality in Tanzania yet despite this, only 5% of chicken-owning households in Mwang'holo and Zebeya and 14% in Ipililo vaccinated against this disease (vaccination rate is higher in Hinduki at 25%).

# 5 CONCLUSIONS

## 5.1 Recommendations

All villages share many commonalities in their profiles although overall Mwang'holo has fewer resources both socially and economically than other three villages. As district and village leaders review these results, it would be meaningful for them to consider how best to increase water, education and health care quality as well as alleviate food insecurity problems. Specific recommendations we leave to district and village leaders and other local government authorities who understand the local context and can better apply these results. Our general recommendations include the following:

- District leaders share these results with other appropriate leaders and use these data to inform the design of future interventions at the village and district level
- Build on existing strengths within these villages such high mosquito net coverage; child vaccination rates for BCG, DPT and polio and widespread latrine ownership. Both villages should be encouraged to strive for 100% coverage in each of these areas.
- Significant infrastructure support is needed for schools and clinics in order to improve the quality of services they are able to deliver. .
- Reducing health outcomes and food security in both villages is the limited access to protected drinking water for most villagers; this should be a primary target for improved quality of life for all villagers.
- Women's education rates are particularly low and this in turn may be affecting the lower nutrition intake and cases of malnutrition identified in the villages. Increasing women's literacy skills and in particular, their knowledge of nutrition, water quality, and HIV/AIDS could improve health outcomes for the whole family.
- There is a need to expand access to agricultural services, the coverage of extension workers to rural villages and access to vaccinations for livestock. In addition, community level

training on the value of kitchen gardens and Newcastle disease vaccinations could also significantly improve food security.

## 5.2 Next Steps

The data and analysis presented in this report will be compiled with similar data gathered and analyzed from other districts participating in the Whole Village Project (WVP). WVP will eventually conduct a big picture analysis of all compiled data to achieve its long-term project objectives, which are to:

- Identify interdisciplinary strategies that improve public health, nutrition, education, conservation and food security to help alleviate poverty and sustain natural resources, villages and wildlife in rural Tanzania;
- Establish a long-term monitoring and evaluation system to measure the effectiveness of foreign assistance programs and aid over 10-20 years in purposefully selected rural villages using validated survey methodologies;
- Provide data in a meaningful way for village self-empowerment and capacity building that leads to greater civic engagement and community capacity; and to
- Create a model for translational research and application in multiple settings.

WVP intends to return to each village surveyed in Maswa District in 2-3 years to re-assess the current status of each village. In the immediate future, the Savannas Forever Tanzania (SFTZ) team will return to each village to present the data collected and to discuss the results and conclusions of this report. Data and reports will also be shared with government officials and policy makers in Tanzania, and non-governmental and local government partners working on the ground in the villages surveyed.

## 5.3 How You Can Help

The purpose of this report is to provide data to district and local leaders in order to inform your decision-making for future social and economic development activities. Please communicate with the Whole Village Project staff and leaders to discuss the usefulness of these data, whether or not there are other indicators that would be useful to you, and if we have missed anything in our assessment and analysis of your village and/or district.

## APPENDIX A – SURVEY INSTRUMENTS

Household level

- Household survey
- Food security, nutrition and jatropha

Individual surveys:

- HIV/AIDS knowledge, attitude and practice
- Under-five child anthropometric measures and health

Focus group and key informant interview questionnaires:

- Village Resources
- Agriculture & livestock focus group
- Village leadership
- Village institutional analysis
- Women's focus group
- Men's focus group
- Headmaster questionnaire
- Health Officer questionnaire

# APPENDIX B – TABLE OF SELECTED INDICATORS BY VILLAGE

| | | Hinduki | Ipililo | Mwang'holo | Zebeya |
|---|---|---|---|---|---|
| **THE HOUSEHOLD AND HOUSING** | | | | | |
| | Number of households surveyed | 60 | 59 | 60 | 60 |
| | Average household size | 8.2 | 8 | 7.7 | 8.1 |
| | % households in polygamous marriage (more than 1 wife) | 13.3% | 33.9% | 33.3% | 33.3% |
| | % of households headed by women | 19% | 22.8% | 29.8% | 24.1% |
| | % of households with corrugated roof | 33.3% | 71.2% | 30% | 45% |
| | % of households using a toilet | 55% | 84.8% | 41.7% | 81.7% |
| | Avg time (minutes) required to collect water | 66.1 | 40.7 | 67.9 | 177.9 |
| | % households use firewood as primary energy source for cooking | 98.3% | 96.6% | 96.7% | 95% |
| **EDUCATION** | | | | | |
| | % of all adults without education | 28.6% | 15.8% | 25.7% | 26.7% |
| | % of household heads completed primary school | 50.0% | 49.1% | 36.2% | 51.7% |
| | % of adult men completed primary school | 58.8% | 66.3% | 54.5% | 68.4% |
| | % of adult women completed primary school | 50.4% | 59.8% | 56.1% | 52.2% |
| | Average primary school teacher to student ratio | 1:49; 1:121 | 1:72; 1:67 | 1:88 | 1:107 |
| | Average primary school textbook to student ratio | 1:5; 1:10 | 1:6; 1:30 | 1:3 | 1:10 |
| | Average secondary school teacher to student ratio | 26:587 | 5:258 | N/A | 8:469 |
| | Average # of years teachers stay at primary school | 7 years; 6 years | 4 years; 10 years | 10 years | 8 years |
| | Average # of years teachers stay at secondary school | 5-7 years | 2.5 years | N/A | 8 years |
| | Ratio of female to male gross enrollment rates (primary school) | 217:223; 188:176 | 498:436; 407:536 | 324:293 | 420:438 |
| | Ratio of female to male gross enrollment rates (secondary school) | 587:0 (Girls School) | 81:177 | N/A | 162:307 |
| **HEALTH** | | | | | |
| | % of households with at least one mosquito net | 85% | 91.5% | 93.3% | 91.7% |
| | % of households with access to protected drinking water | 35% | 83.1% | 13.3% | 83.3% |
| | % of households that take measures to make the water safe | 35% | 42.4% | 28.3% | 28.3% |
| | # of hospital/dispensary/clinic in the village | 0 | 1 | 0 | 1 |
| **CHILDREN UNDER 5** | | | | | |
| | % of infants exclusively breast fed through 6 months of age | 6.2% | 8.5% | 19.2% | 12.1% |
| | Average age in months at introduction of complementary feeding | 4.4 | 4.6 | 4.7 | 4.9 |
| | % of children whose birth mother is still alive and inside the hh | 3% | 1.3% | 0% | 2.7% |
| | % of children moderately to severely underweight | 2.4% | 0% | 0% | 0% |
| | % of children who are vaccinated for BCG | 95.1% | 98.7% | 88.6% | 97.3% |
| | % of children who are vaccinated for polio | 96% | 96.2% | 87.3% | 100% |
| | % of children who are vaccinated for DPT | 96% | 92.3% | 86.1% | 98.7% |

| | | Hinduki | Ipililo | Mwang'holo | Zebeya |
|---|---|---|---|---|---|
| | % of children who are vaccinated for measles | 76.2% | 69.2% | 60.8% | 78.7% |
| | % of children received Vitamin A supplement | 63.4% | 56.4% | 64.6% | 76% |
| | % children with fever | 56.4% | 66.7% | 59.5% | 65.3% |
| **AIDS KNOWLEDGE** | | | | | |
| | % of men with high AIDS knowledge score (5-6 points) | 63% | 63% | 76% | 74% |
| | % of women with high AIDS knowledge score (5-6 points) | 57% | 67% | 68% | 72% |
| | % of women who know that a person can protect themselves from HIV | 96% | 96% | 90% | 96% |
| | % of men who know that a person can protect themselves from HIV | 97% | 100% | 100% | 100% |
| | % of men who have talked with their wife/primary partner about ways to prevent HIV/AIDS | 47.5% | 75.8% | 60% | 62.2% |
| | % of women who have talked with their husband/primary partner about ways to prevent HIV/ AIDS | 43.5% | 44.4% | 50.9% | 40% |
| **FOOD SECURITY AND NUTRITION** | | | | | |
| | % of households worried about food in the past 4 weeks | 40% | 27.1% | 23.7% | 46.7% |
| | % of households ate limited variety of food in the past 4 weeks | 93.3% | 86.4% | 84.8% | 81.7% |
| | % of hhs went one day and night with no food in the past 4 weeks | 5% | 1.7% | 8.5% | 10% |
| | % of households that are currently growing kitchen garden | 15% | 13.6% | 5.1% | 10% |
| | Avg # of days/times hhs ate meat protein in past week | 3.1 | 3.8 | 4.5 | 3.6 |
| | Avg # of days/times hhs ate legumes in past week | 3.2 | 2.7 | 2.1 | 2.2 |
| | Avg # of days/times in last week hh ate foods with Vitamin A | 2.5 | 2 | 2.3 | 1.3 |
| | # of different types of food eaten in last week | 6.5 | 6.4 | 6.0 | 5.8 |
| | Food Security Index | 3.8 | 3.4 | 3.1 | 3.7 |
| **ECONOMIC ACTIVITY, AGRICULTURE AND INCOME** | | | | | |
| | % households own any agricultural land | 88.3% | 72.8% | 85% | 63.3% |
| | Average acres cultivated per household | 7.5 | 7.5 | 13.3 | 10.5 |
| | Average # of cattle owned per household | 10.4 | 12.9 | 14.7 | 10.9 |
| | Average # of goats/sheep owned per household | 13.7 | 9.2 | 15 | 10.8 |
| | Average # of chickens owned per household | 10.4 | 7.1 | 9 | 6.6 |
| | % of hhs whose chicken are vaccinated for Newcastle disease | 25% | 13.6% | 5.3% | 5.1% |
| | % of cattle lost to disease in the past 12 months | 12% | 9% | 13% | 6% |
| | % of cattle lost to drought in the past 12 months | 1% | 1% | 1% | 0% |
| | % of chickens lost to disease in the past 12 months | 44% | 43% | 43% | 54% |
| | % of chickens lost to drought in the past 12 months | 0% | 0% | 0% | 0% |
| | % of chickens lost to wildlife in the past 12 months | 14% | 23% | 14% | 16% |
| | % of goats/sheep lost to disease in the past 12 months | 12% | 18% | 13% | 9% |
| | % of goats/sheep lost to drought in the past 12 months | 0% | 2% | 1% | 1% |
| | % of goats/sheep lost to wildlife in the past 12 months | 2% | 2% | 3% | 2% |
| | % of household heads with the main occupation of farming | 89.7% | 90.6% | 95.7% | 89.7% |
| | % of HHs that irrigate the plots in village (from focus group data) | 0% | 10% | 0% | 3% |
| | % households with bicycle | 70% | 62.7% | 56.7% | 60% |

| | | Hinduki | Ipililo | Mwang'holo | Zebeya |
|---|---|---|---|---|---|
| | % households with radio | 45% | 42.4% | 33.3% | 35% |
| | % households with cell phone | 48.3% | 40.7% | 30% | 41.7% |
| **KEY INSTITUTIONS AND CIVIC ENGAGEMENT** | | | | | |
| | Distance to major weekly market | 10 km | 6 km | 60 km | 6 km |
| | # of village committees/groups | 3 | 7 | 5 | 3 |
| | # of NGOs | 4 | 4 | 4 | 2 |
| | # of credit, banking services or VICOBA | 1 | 1 | 1 | 2 |
| | % HH that participated in village assembly in past 12 months | 20.0% | -- | -- | -- |
| | % of HH participating in village government or committee in past 12 months | 22.5% | -- | -- | -- |
| | % of HH that asked village leaders for assistance in past 12 months | 77.5% | -- | -- | -- |
| **DEMOGRAPHICS** | | | | | |
| | Religion (% Christian; % Muslim; % Traditional) | 45%;2%; 0% | 51%; 0%; 3% | 40%; 3%; 0% | 33%; 0%; 0% |
| | Dependency Ratio (# of child (0-14 years) and aged (65+) population per 100 intermediate age (15-64 years) | 122.2 | 124.4 | 120.1 | 102.1 |
| | Child-Woman Ratio (# of children aged 0-4 years per 1,000 women in the age group 15-44 years) | 0.56 | 0.54 | 0.52 | 0.39 |
| | Sex Ratio (# of males per 100 females) | 0.96 | 0.96 | 1.0 | 0.98 |