

UNIVERSITY OF MINNESOTA



The Whole Village Project

Village Reports for Engusero, Makame, Matui,
Ndedo, and Ngipa in Kiteto 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 the 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 Engusero, Makame, Matui, Ndedo, and Ngipa villages, Kiteto District during the month of April 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 five villages in Kiteto District: Engusero, Makame, Matui, Ndedo, and Ngipa. 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 between the five villages surveyed in Kiteto District. In particular, there is relatively high mosquito net ownership and high rates of child vaccinations for BCG, DPT and polio.

In Ndedo, 100% of households own at least one net and the lowest percentage is 75% in Ngipa. Despite this strength, an average of only 43% of nets in the five villages had recently had their nets 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.

Infant and young child vaccination rates for BCG, DPT and polio were averaged at over 95% in the five villages. However, vaccination rates for measles drop to between 71% in Ngipa and 81% in Matui; given the virulence of this disease, clinic officers and health committee members should identify strategies to meet the gaps in measles vaccination. Although an average of 69% 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.

Of the villages surveyed, 100% of households in Makame were reported with latrines. The numbers for the four other villages surveyed will be represented in the following section: District Gaps. Access to latrines and appropriate waste disposal reduce opportunities for communicable disease transmission and water borne diseases.

3.2 District Gaps

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 both villages, the quality of schools is a concern and 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, poor student exam results, and the limited food available at school. Only Makame and Ndedo, at a cost, provide school meals. 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.

Access to quality health services is also limited in the district. Most respondents in this district felt the treatment at local dispensaries was not helpful. According to men's and women's focus group discussions, malaria is the number one problem followed by sexual health. In addition, maternal and child health services are limited.

Any level of acute malnourishment among children under five must be considered a gap. In the villages surveyed in Kiteto District, acute malnourishment is a grave problem in Makame where 11% of children under-five were identified as malnourished, followed by 7% in Matui. In Engusero, fewer children under-5 (48%) were identified as malnourished while the percentage was higher in Ndedo (51%). In both villages, the main source of food for children under-five is ugali, which itself cannot meet a child's nutrition needs. There was also a significant lack of green vegetables and fruit in the diet of children and the limited intake of the nutrients these foods offer affect child development.

Farming, as the main source of income in Engusero, Matui, and Ngipa, is vulnerable to the problem of soil erosion. Households are concerned at the danger of soil erosion to be a serious problem, which is harmful to the sustainability and reliability of farming. Further, there is little to no irrigation of plots and very limited use of fertilizers. Only Engusero and Ngipa indicated that they had received visits from agricultural extension officers in the past year.

Newcastle Disease is the number one cause of chicken mortality in Tanzania. Vaccination rates against Newcastle Disease are low in Kiteto District. Only 2% of households in Makame owning chickens vaccinate those chickens against Newcastle Disease. The highest vaccination rate (14% in Ngipa) is still low given the severe consequences of infection with Newcastle Disease. Household surveys revealed that 25% to 46% of chickens had been lost to disease in the past year in these villages.

3.3 Opportunities

Girls' participation in secondary school is quite low. The education committees in all of the 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.

Farmers in three villages reported that did not receive a visit by an agricultural extension worker in the past year. 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.

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.

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 Kiteto district. Village leaders have the opportunity to convey knowledge about kitchen gardens as a means to alleviate food insecurity.

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 Kiteto District are vaccinated against tuberculosis (BCG), DPT, polio, and measles, as recommended by the World Health Organization (WHO). However, vaccination coverage is not universal. Given the already

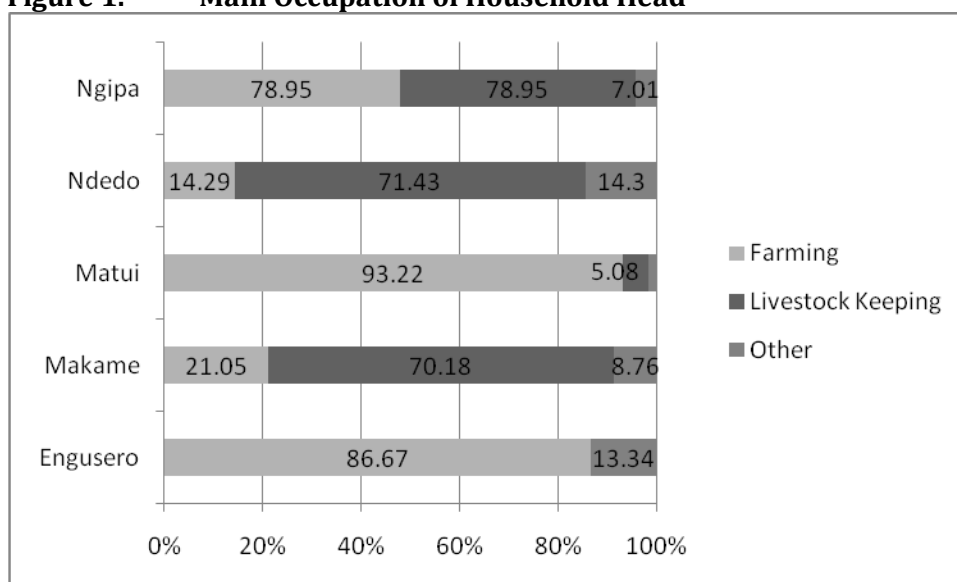
high level of vaccination, the district has an opportunity to reach universal coverage against vaccine-preventable disease given the proper allocation of resources.

4 RESULTS AND DISCUSSION

4.1 Household Livelihood and Assets

Survey data show a large variance in the occupations of household heads among the villages surveyed in Kiteto District (see Figure 1). In Matui nearly all respondents (93%) report farming as their main occupation while in Ndedo only one in seven respondents report farming as their main occupation (14%). Ndedo and Makame report the highest number of livestock keeping as a primary occupation. The remaining primary occupations of household heads include professionals, business owners, students, and casual laborers. Although not listed as a main occupation, a number of households own livestock in the form of cattle, goats and sheep, and chickens.

Figure 1. Main Occupation of Household Head



More households are headed by a man than a woman in all villages surveyed. The average percentage of households headed by women is as follows (smallest to largest): Matui (10%), Engusero (11.67%), Ngipa (14.04%), Makame (29.82%), and Ndedo (44.64%).

Income, in the form of cash or goods, is most commonly generated through agricultural production and livestock sales. Village leaders each of the five villages in Kiteto District listed a combination of livestock sales, agriculture, and small businesses as the main ways to make a living and the primary source of income. This is reflected by the percentage of households that sell cash crops in Engusero

and Matui (90%), as well as in Ndedo and Ngipa (100%). Livestock, alcohol sales (Engusero) and sales from small businesses are additional non-agricultural income generators.

Focus group discussions (FGDs) facilitated with men, women, and village leaders 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	Village Leader
Engusero	Microfinance Borehole Subsistence Farming	Borehole Microfinance Sewing Machines	No Information
Makame	Microfinance Borehole Agricultural Equipment	Subsistence Farming Microfinance Borehole	Livestock Subsistence Farming Small Business
Matui	Borehole Beekeeping Microfinance	Chickens Cattle/Goats Borehole	Cash Crops Subsistence Farming Small Business
Ndedo	Microfinance Youth Employment Borehole	Subsistence Farming Borehole Grinding Machine	Livestock Small Business
Ngipa	Microfinance Animal Husbandry Training Poultry	Subsistence farming Microfinance Borehole	Subsistence Farming Livestock Small Business

The recommended activities did not vary significantly between gender focus groups. Other recommendations included alternative income generating activities such as beekeeping, working with poultry, and obtaining a sewing machine. Village leaders focused on subsistence farming and small business.

Asset ownership, a proxy indicator of a household's socioeconomic status, was polled. In all five villages, when households were asked about ownership of durable goods such as mobile phones, radios or bicycles, the averages demonstrated the most common items owned as bicycle (47%)

followed closely by radio (42%), and mobile phone (24%). The two villages of Engusero and Matui reported the highest percentages of bicycles, radios, and mobile phones.

Of the houses surveyed in Kiteto District, there was significant variance between the materials employed for construction. Many were built with natural materials, with walls made of mud and baked bricks and floors made of earth or clay. Houses surveyed in Kiteto District were divided based on roofing types. Over 60% of houses surveyed in the villages of Makame and Ndedo were built with natural materials, such as mud/straw/poles and grass/palm thatch. In the villages of Engusero, Matui, and Ngipa, between 70% and 95% of roofs were covered with corrugated metal.

4.2 Civic Engagement

Household level civic engagement was measured by the household survey respondent's membership in village government or committee, participation in village assemblies, and asking a village leader for assistance. Almost 1 in 4 respondents in Engusero are members of either a village government or a village committee, which requires the highest level of personal investment of time and resources. This is in contrast to Makame where less than one in ten respondents participated in a village assembly meeting in the last 12 months.

Table 2. Civic Participation by Village by Percentage of Respondents

	Engusero	Makame	Matui	Ndedo	Ngipa
Village Government or Committee Member	24.53	20	13.11	8.47	16.67
Participated in Village Assembly (last 12 mo)	22.64	8.33	24.59	15.25	21.67
Asked Village Leader for Assistance (last 12 mo)	83.02	58.33	63.93	30.51	71.67

4.3 Village Institutions

Table 2 presents a picture of the institutional analysis conducted in the villages surveyed in Kiteto 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.

The tally of total institutions in each village is listed in the last row of Table 2, and sub-totals by type of institution is listed within the table immediately following each sub-section. Although these

tallies do not give a picture of the types of services available in each village, they do indicate the relative level of activity by type of service providers.

Table 3. Institutional Resources by Village

Institution	Engusero	Makame	Matui	Ndedo	Ngipa	Sector
Village-Run						
Education	60%	50%	75%	90%	100%	Education
Health Service	65%	40%	50%	95%	-	Health
Police	-	-	50%	-	-	Legal/Law Enforcement
Religious Institution	95%	100%	95%	98%	100%	Religion, Social Welfare
Village Council/ Government	65%	90%	60%	70%	70%	Politics/Government
Village Market	x	-	-	x	-	Business Development
Community/Publicly Owned Water	95%	-	-	-	x	Water
Sub-Total Village-Run	6	4	5	4	4	
Village Committee/Group						
Environment/Natural Resources Committee	x	x	-	x	x	Energy/Environment
Education Committee	x	x	x	x	x	Education
Water Committee	x	x	-	x	x	Water
Agricultural & Livestock Committee	-	x	-	x	x	Agriculture
Elder's Committee	x	x	-	-	-	Social Welfare
Land Committee	x	x	x	x	x	Environment
Hazards/Disaster Committee	x	x	x	x	x	Environment
Security Committee	x	-	x	x	x	Legal/ Civil Service
Community Development/ Planning/ Financial Committee	x	-	-	x	x	Business Development, Financial, Social Welfare
Health, HIV/AIDS Committee	x	x	x	x	-	Health, HIV/AIDS
Social Services/ Social Welfare Committee	-	-	-	x	-	Social Welfare
Sub-Total Village Committee/Group	9	8	5	10	8	
Non-governmental Organizations						
Arusha Diocese Development Office (ADDO)	90%	-	30%	-	100%	Development/ Social Welfare [built wells]
Agricultural Marketing Cooperatives (AMCOS)	90%	-	30%	-	20%	Financial/Socioeconomic
African Wildlife Foundation (AWF)	-	-	-	100%	-	Wildlife/Conservation
BSF	-	-	-	50%	-	Helping pastoralists
Community Research and Development Service (CORDS)	-	50%	-	50%	-	Aid/Development
Foundation for International Community Assistance (FINCA)	50%	-	-	-	20%	Financial/Socioeconomic
Frontiers of Tanzania	-	-	-	70%	-	Hunting Tourism/Wildlife/Conservation
Jatropha Products Tanzania Ltd. (JPTL)	-	-	-	-	50%	Agricultural Development/Social Welfare
Kilimanjaro National Park Association (KINAPA)	50%	70%	-	90%	50%	Wildlife/Conservation
LAMP	-	-	-	-	75%	Water Project
Ndorobo Photographic Safari	-	30%	-	-	-	Tourism/Wildlife/Conservation
Participative Agricultural Development and Empowerment Program (PADEP)	95%	-	-	90%	100%	Farming/Agriculture
SACCOS/ VICOBA	25%;50%	50%	40%	-	100%	Financial/Socioeconomic
Sungusungu	98%	-	-	-	-	Social Welfare [conflict resolution]
Savannas Forever Tanzania (SFTZ)	-	-	-	70%	-	Aid/Development, HIV/AIDS,
Tanzania Social Action Fund (TASAF)	90%	100%	-	100%	50%	Social Welfare [built schools, dispensaries]
Tanzania Big Game Safari	-	50%	-	30%	-	Hunting Tourism/Wildlife/Conservation

Water Aid	-	-	-	100%	-	Water/Civil Service
World Food Program	95%	-	-	98%	-	Food/Hunger
WMA	-	-	-	75%	-	Education, Health, Social Welfare
Sub-Total NGO	9	6	3	12	9	
Total Institutions	24	18	13	26	21	

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. All five villages have similar numbers of village-run institutions. However, Ndedo (10) has twice as many village committees as Matui (5). Perhaps the villages with high numbers of village committees are compensating for the limited number of other services available through physical institutions. A large focus of many of the village run organizations and committees are on environmental and health issues and improving access to credit. In focus groups, villagers were asked to provide an assessment in the form of a percentage of some of the major institutions in their village. All five of the focus groups responded positively regarding religious institutions. Ndedo and Ngipa generally responded positively about their village run institutions and committees with slightly lower rates for village government. Although villagers in focus groups acknowledged village governments, schools and dispensaries were each making some positive contributions, they also named an equal number of weaknesses.

Ndedo, in addition to having the greatest number of village committees, also reported the highest number of NGOs (12). Engusero and Ngipa each reported nine NGOs. Services provided by the NGOs focused on agriculture, development, social welfare, finances, and environmental conservation. In general, Engusero and Ndedo provided high average scores for NGOs working in its community whereas in Matui there was a wide variation from highly favorable to critical. Most of the criticism in all cases was because NGOs had only reached a few number of people or had not fulfilled all the services that were expected.

4.4 Education

4.1.1 Household-Head Education

Among the five villages surveyed, observable commonalities in household-head education statistics create two groups. Of household-heads in Engusero, Matui, and Ngipa, proportions of primary school completions are approximately half, Engusero reporting the highest percentage (62%). The villages of Makame (18%) and Ndedo (16%) both reported about one-sixth of household heads as having completed primary school; the rates of household heads in both villages with no education was well over half of respondents. Of the villages, no household heads were recorded as having

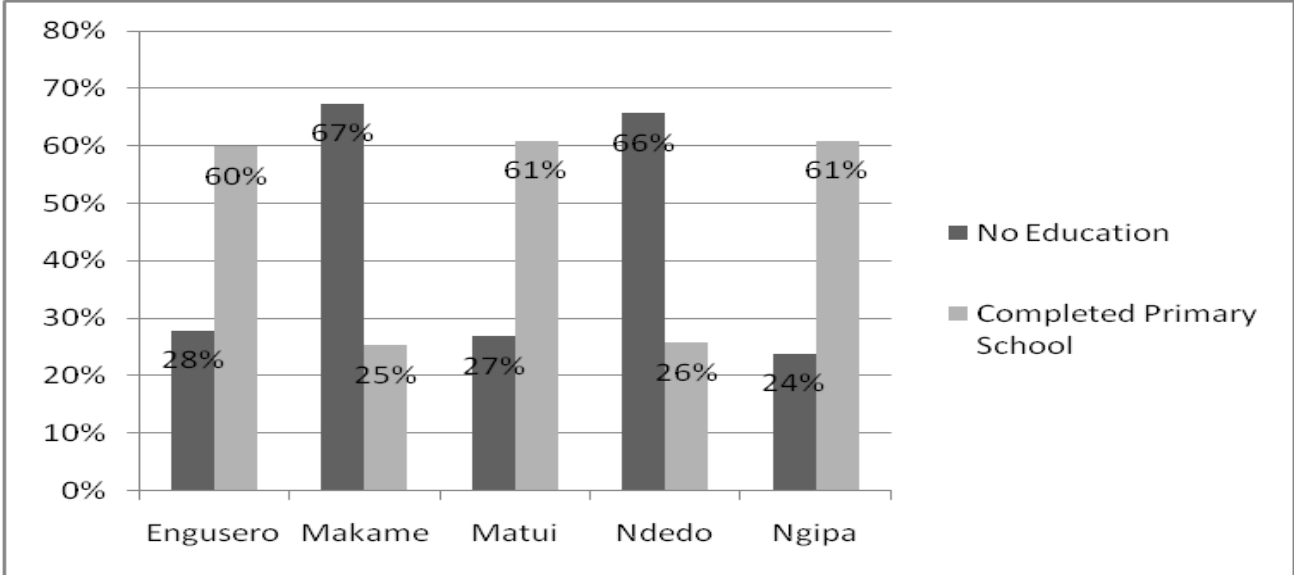
completed secondary school. In addition to low secondary school rates, other types of educational experiences, such as adult or vocational education, were low.

In contrasting education rates between male and female household-heads, an interesting observation can be made. The number of women was nearly double the number of men in attending primary school but not completion. The rates of primary school completion, however, show the rates reversed. Primary school completion rates were approximately 50% of male household heads in Engusero, Matui, and Ngipa. Female primary school completion rates varied from 17% to 38% in the same three villages. In the villages of Makame and Ndedo, education rates were low across the board. The percentage variants may be attributed to the low number of respondents, especially among women household-heads.

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, with the exception of Engusero (see Figure 3).

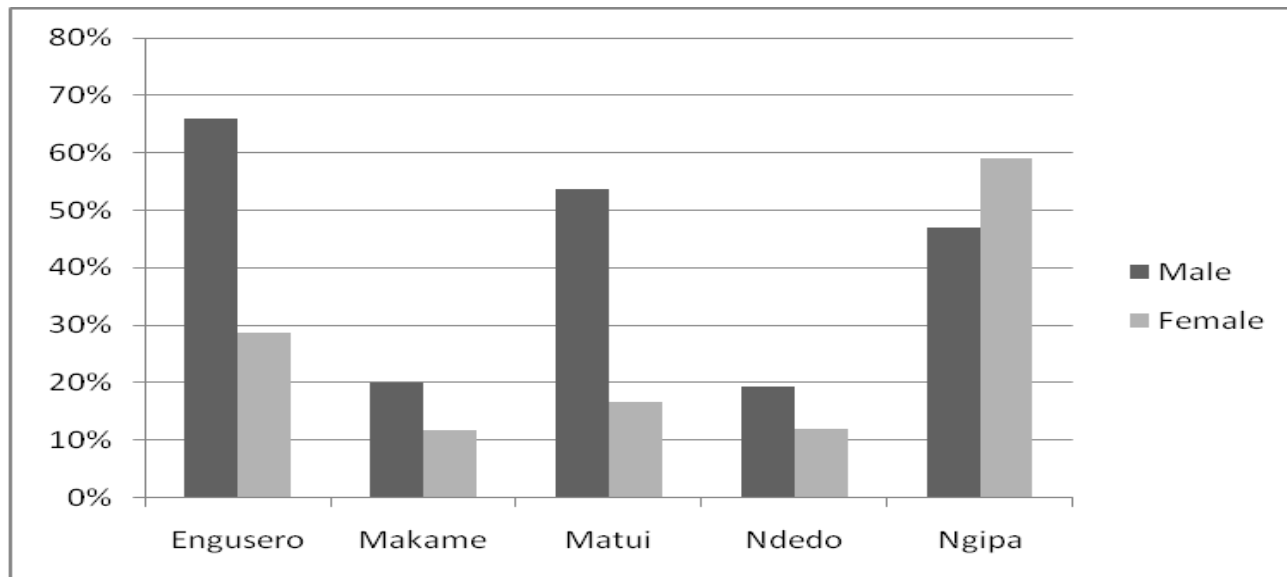
Figure 2. Percent Adults Completed Primary School versus No Education



Nearly one-quarter of adults in Engusero, Matui, and Ngipa had no education with nearly half as many women as men completing primary school in Engusero. Primary school completion rates are below 20% for both men and women in Makame and Ndedo.

As shown in Figure 4, adult women have slightly higher primary school completion rates than men although it is not a statistically significant difference. Ngipa is the only village in which female primary school completion rates were higher among females than males.

Figure 3. Adult Primary School Completion Rates, Disaggregated by Sex



Ngipa followed by Ndedo have the highest percentages of adults with at least some secondary education, but this is still low at only 14%. Only Ngipa, with two secondary school graduates, reports any adult surveyed having completed secondary school.

In four of the five villages, Matui the exception, enrollment rates were higher for boys than for girls. In Makame and Ndedo, twice as many boys attend secondary school as girls. Both schools need to work harder at retaining female students. Ngipa has an exceptionally small number of students enrolled totaling 67 students.

4.1.3 Access to Primary Education

All five villages surveyed in Kiteto District have at least one primary school while Engusero and Matui each have three primary schools. Only Matui and Ndedo have secondary schools. 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/School	Students Enrolled	Teacher to Student Ratio	Classroom to Student Ratio	Textbook to Student Ratio	% Teachers completed Form IV
Engusero	606	1:65	1:101	1:13	90%
Makame	466	1:93	1:117	1:7	100%
Matui	417	1:70	1:139	1:5	84%
Ndedo	641	1:71	1:92	1:4	100%
Ngipa	67	1:7	1:13	2:3	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 Kiteto District have poor teacher-to-student ratios (Makame, one teacher for every 93 students), classroom-to-student ratios (Matui, 139 students need to use one classroom), and textbook-to-student ratios. The Men's and Women's focus groups in the five villages cited the core weaknesses of the schools as lacking in teachers, female teachers, teacher housing, classrooms, libraries, toilets, and academic rigor.

Another measure of access is regular school attendance. Attendance rates are high in the primary schools ranging from the lowest attendance rates in Matui (79%) and the highest rates in Ndedo (100%). Attendance rates vary dramatically in Makame and Ndedo with nearly twice as many boys and girls attending. In Engusero,

The two secondary schools in the villages surveyed in Kiteto District, located in Matui and Ndedo, had similar gender disparity among students both enrolled and regularly attending. Although enrollment rates at the secondary school in Matui indicate slightly higher numbers of females than males, rates indicate twice as males (40%) as females (20%) regularly attend. In Ndedo, male enrollment rates are more than double male than female rates. Attendance rates are 35% for males and 20% for females.

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 Matui, Ndedo, and Ngipa have a vast majority of students coming to school hungry (see Table 4).

Table 5. Percent of Students Attending Primary School Hungry

Village	% Students Attending School Without Eating Food or Having Tea Only	School Meals Provided
Engusero	41%	None
Makame	5%	Breakfast and lunch at no cost
Matui	85%	Tea
Ndedo	75%	Breakfast, lunch, dinner at cost of 350 Tsh per meal
Ngipa	85%	None

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 Kiteto District was collected through focus group discussions with men and women. In every of the five 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 sexual health and a number of additional concerns. For children, pneumonia, diarrhea, and meals 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
Engusero	Malaria Tuberculosis Typhoid	Malaria Diarrhea Tetanus	Malaria Diarrhea Measles
Makame	Bladder Obstruction High Blood Pressure Swollen Legs	Malaria Bladder Obstruction Typhoid	Malaria Diarrhea Measles
Matui	Malaria	Malaria	Malaria

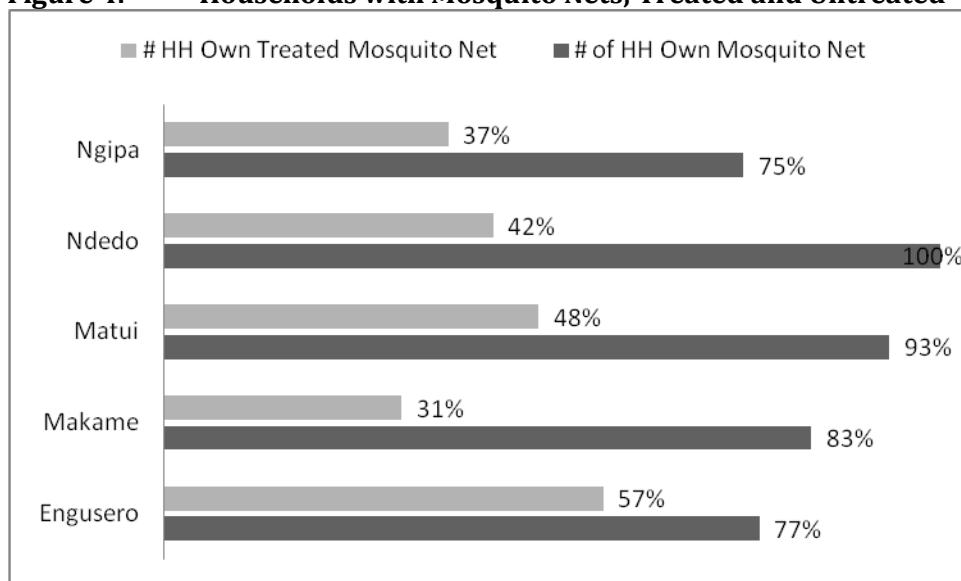
	Stomach Problems Sexual Health	Stomach Problems Blood Pressure	Pneumonia Diarrhea
Ndedo	Malaria Sexual Health Leg/Back Diseases	Malaria Leg/Back Diseases Sexual Health	Malaria Measles Diarrhea
Ngipa	Malaria Sexual Health Bladder Problems	Malaria Sexual Health Breast Diseases	Malaria Pneumonia Worms

In Kiteto District, with the exception of Ngipa for which medical facility data is not available, the villages surveyed were fortunate to have a government dispensary though some services and drugs or equipment are lacking. The facilities have a combination of medical officers, assistant medical officers, nurses, and nurse assistants. Ndedo has the most qualified staff including a medical officer, assistant medical officer, and nurse assistant. The dispensaries in Engusero and Ndedo have one refrigerator each. Additionally, the dispensaries in Engusero, Matui, and Ndedo offer maternal/child health and family planning services. Men’s and Women’s focus groups noted a lack of testing facilities, too few doctors, lack of available medications, intermittent pain killer availability, and lack of medical facilities capable of providing advanced medical needs. In Ndedo, focus groups indicated traditional medicines are used. Household surveys indicate that the vast majority of households in this district (91%) seek treatment for ill children under-five from a dispensary.

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 five villages have high rates of mosquito net ownership with Ndedo having the highest at 100% and the lowest in Engusero at 77%. Treatment rates were consistently low; the average rate of households owning a treated net was 43% with the highest in Engusero (57%) and the lowest in Makame (31%) If consistent mosquito net use is practiced by household members, they should begin to see their malaria rates decrease as well.

Figure 4. 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 or also mentioned as concerns. These included: sexual health, diarrhea, stomach and bladder problems among others. The Health Officers noted the most common symptoms treated in the village over the past 12 months for adults were malaria, gonorrhoea, diarrhea, pneumonia, cholera, and eye diseases. Health Officers also expressed concern over lack of education on a number of health issues including proper waste disposal and sexual health, insufficient medicines, too few staff and no laboratory equipment.

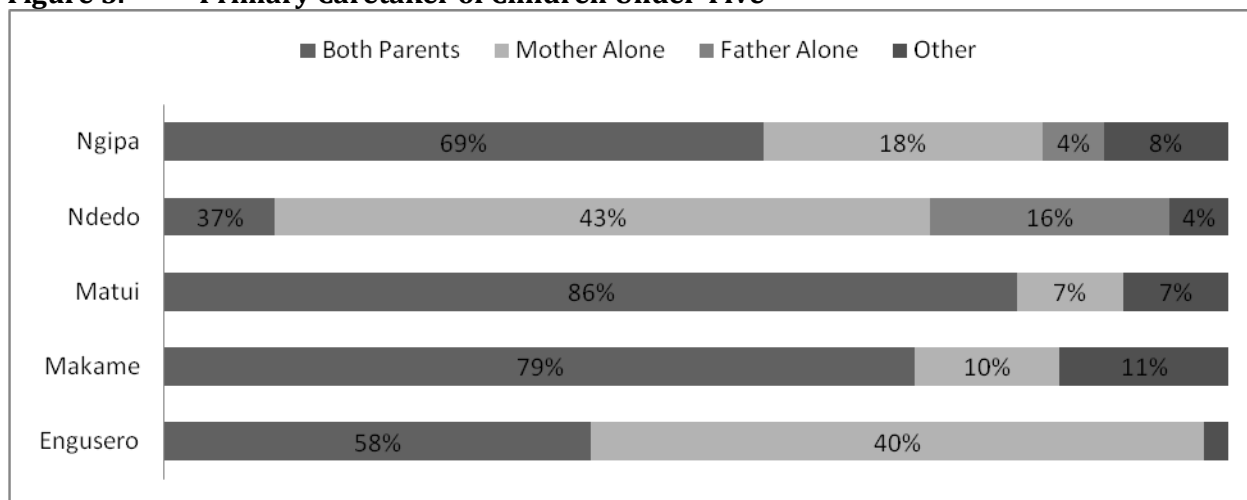
4.5.3 Under-Five Health Status

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. Over 90% of mothers of children under-five in all five of the villages surveyed in Kiteto District are alive and in the household. In Matui four mothers are alive but not living in the household and three mothers in Makame have died. Of the five villages, eleven households had lost the natural father. The percentage of households with the father still alive remains high at 92-98%. In roughly 15% of households, the

father is alive but lives outside the household. Figure 6 indicates that childcare is mostly shared between the mother and father. In Ndedo, however, only 37% of respondents indicated both the father and the mother were living in the same household. It is rare for the father to be the primary caretaker of the children. In Ndedo, the father was reported as the primary caretaker in 16% of households surveyed. With the exception of Ndedo, fathers were reported as being primary caregivers in two situations among the four remaining villages surveyed in Kiteto District.

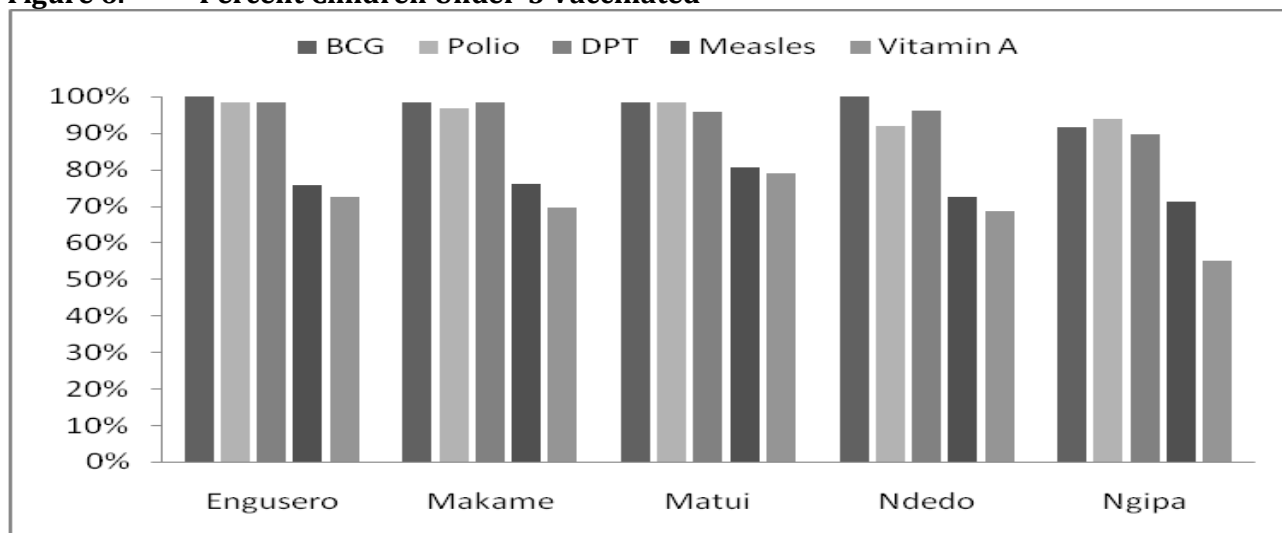
Figure 5. Primary Caretaker of Children Under-Five



In households surveyed where the primary caretaker is someone other than the mother and/or father, the primary caretaker tends to be a grandparent.

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 6. Percent Children Under-5 Vaccinated

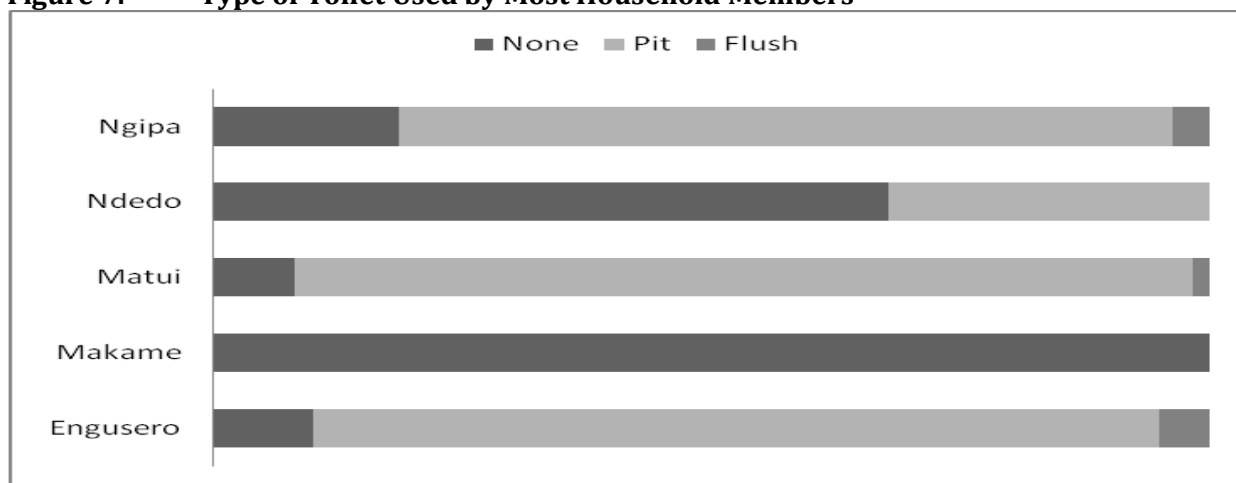


Over 95% of children under-five in Kiteto district have received a DPT, BCG, or Polio vaccine. Among all recommended vaccines, measles vaccination rates (71-81%) are the lowest within each village surveyed, Ngipa with the lowest rates for measles vaccinations and Vitamin A supplements. The data shown in Figure 8 does 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

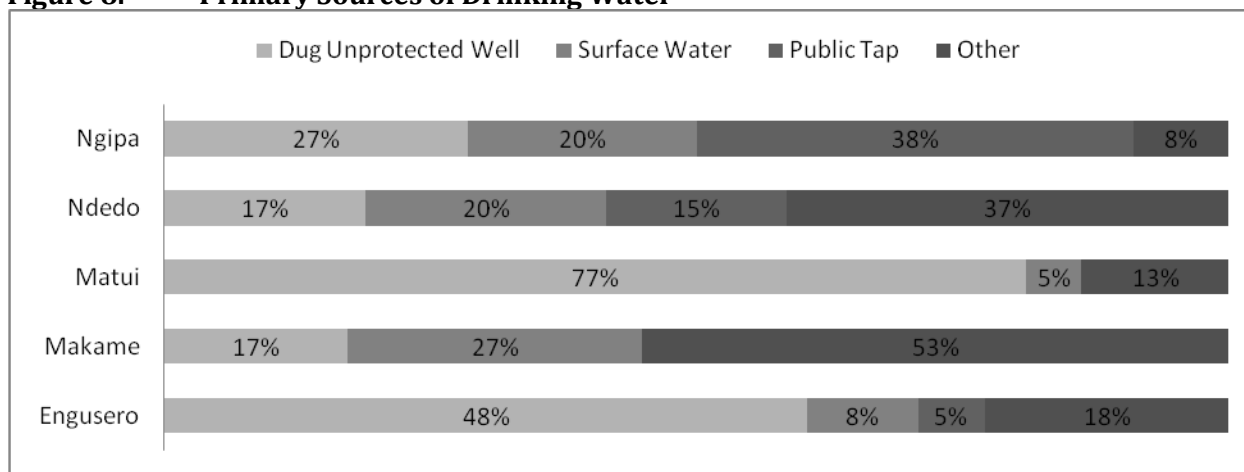
Many infectious diseases, especially diarrheal diseases, can be a result of poor hygiene and contaminated water and food sources. Three of the four villages, Ngipa, Matui, and Engusero have high rates of latrine coverage which is positive. The high rates of households with no refuse disposal in Ndedo (68%) and Makame (100%) is exceedingly disquieting.

Figure 7. Type of Toilet Used by Most Household Members



An average of 14% of households have access to protected drinking water in the villages surveyed in Kiteto district. Of respondents with protected water sources, Ngipa (38%) ranked the highest followed by Ndedo (15%). As shown in Figure 10, sources of drinking water were generally unprotected wells, surface water, and public taps. In Ndedo (37%) and Makame (53%) a large percentage of water came from unknown sources.

Figure 8. Primary Sources of Drinking Water



Given that the majority of households 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. In Engusero, 77% of households are treating their water in some way but in Makame only 22% of households treat the unprotected water. The villages of Ngipa (38%), Matui (48%) and Ndedo (32%) treat their unprotected water before consumption in varying numbers.

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. Makame residents have the farthest distance to travel to access drinking water (3-7 kilometers) and the longest time to travel (Table 6); Residents of Engusero, Matui, and Ngipa have the shortest distances (1-5 kilometers) and thus spend less time collecting water.

Table 7. Average Time to Collect Water

Village	Minutes to Collect
Engusero	44.3
Makame	196.5
Matui	45.5

Ndedo	100.4
Ngipa	47.5

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 (95%).

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 (64%) than men (36%) participated in the survey. 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
Engusero	44 (41%)	64 (59%)	108
Makame	32 (38%)	53 (62%)	85
Matui	36 (40%)	54 (60%)	90
Ndedo	21 (28%)	55 (72%)	76
Ngipa	33 (35%)	60 (65%)	93

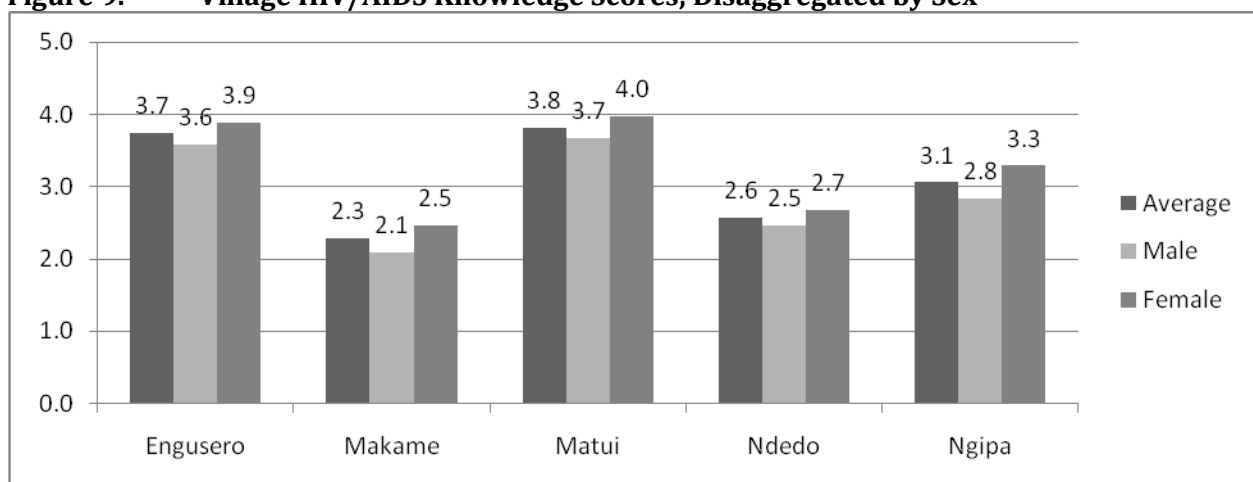
To assess an individual's correct knowledge of HIV/AIDS, the KAP survey asks six questions:

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

3. Can people reduce their chances of getting HIV/AIDS by using a condom every time they have sex?
4. Can people get the HIV/AIDS virus by sharing food with a person who has HIV/AIDS?
5. Is it possible for a healthy looking person to have HIV/AIDS?
6. Can HIV/AIDS be transmitted from mother to child?

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 9. Village HIV/AIDS Knowledge Scores, Disaggregated by Sex



Matui has the highest HIV/AIDS knowledge score (average 3.8), slightly higher than Engusero (average 3.7). The lowest male (2.1) and female (2.5) average knowledge scores are in Makame. In all villages surveyed, the women’s average knowledge score is higher than the men’s.

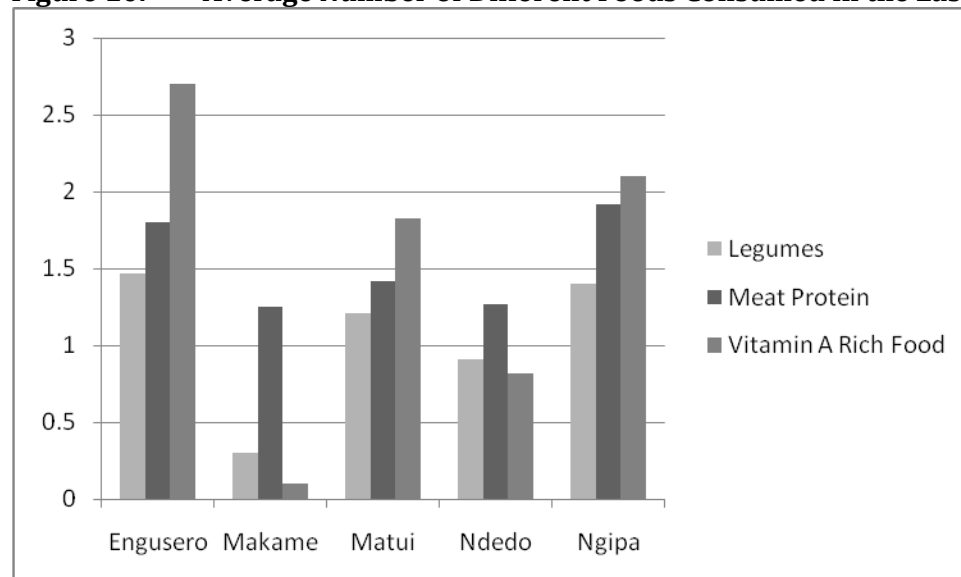
The skip pattern of the KAP questionnaire means that individuals who say they have not heard of HIV/AIDS do not answer any of the six questions, and individuals who say they do not know of any ways to prevent HIV infection do not answer the first four questions, which concern prevention. Since the responses 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.

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, households ate a variety of 2.6 (Makame) to 6.1 (Engusero and Ngipa) types of different foods in a week with a range from 0 to 12. Households in Engusero consume the highest percentages of legumes as well as foods rich in vitamin A. Ngipa reports the highest number of households consuming meat protein while Makame reports the lowest in this category as well as the least number of households eating legumes and vitamin A rich foods. There is large variance between villages when comparing consumption of meat protein, legumes and Vitamin A nutrient foods as shown in Figure 14.

Figure 10. Average Number of Different Foods Consumed in the Last 7 Days



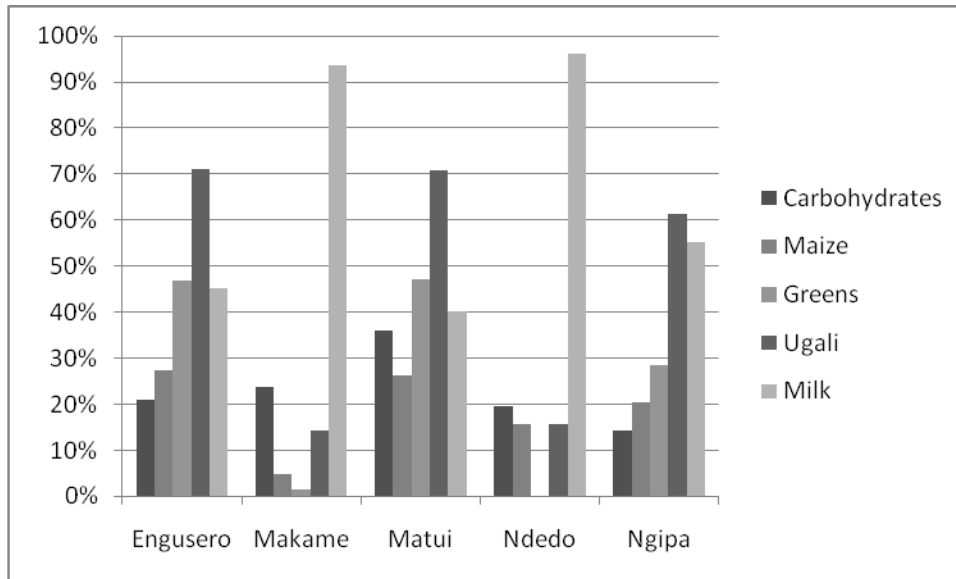
4.5.7 Infant and Young Child Feeding

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. Among children that had been weaned at the time of the survey, the most common age of weaning was 24-26 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. (Percentages labeled in Figure 15 indicate the most commonly eaten food by children under-five in that village.)

Figure 11. Percent Children Under-5 Eating Food Item in Last 24 Hours



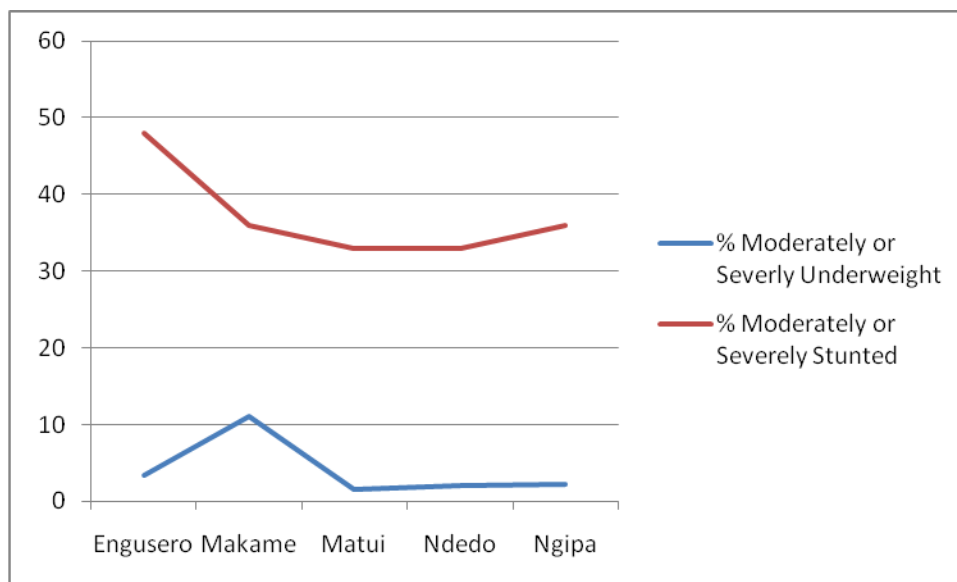
Milk was the most commonly consumed food by children under-five in the last 24 hours in Makame and Ndedo while in the remaining villages ugali was the most commonly consumed food. Greens and maize followed as commonly consumed foods. Consumption of any type of meat or fruit was extremely low. The villages of Ngipa, Engusero, and Makame each reported one child having consumed bananas; five children in Matui and 11 in Engusero consumed other fruits in the past 24 hours. In general, consumption patterns shown in Figure 15 indicate that children in Kiteto District have limited variety in their daily diet.

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 not specified. Nearly half (47%) of children under-five in Engusero and Matui consumed greens. According to Figure 15 then, a greater percentage of children in the two villages surveyed consumed a vegetable than a fruit in the 24 hours preceding the survey.

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. In addition, we use the WHO height-for-age z-score which assesses a child’s average opportunity for height/length given their age. Children who score -2 SD from the norm are considered to be partially or severely stunted. According to the data collected in the survey of children under-five (see Figure 12), more than a third of most children under-five are stunted with the greatest percent (48%) in Engusero. There is less prevalence of underweight or malnourished children ranging from 1.5 to 3.4 % of children with the exception of Makame where 11% of children appear malnourished.

Figure 12. Percent Children Under-5 Malnourished and Stunted



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 villages surveyed in Kiteto District, households in Makame were the least food secure with a mean index score of 7.8 compared to Ndedo (6.1), Matui (4.5), Ngipa (4.1), and Engusero (3.6). Consistent with this finding, one can see in the Table 9 that households in Makame worried about food more often than those in Engusero.

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
Engusero	63%	82%	10%
Makame	95%	93%	80%
Matui	72%	87%	13%
Ndedo	82%	86%	46%
Ngipa	68%	85%	12%

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. Less than 5% of households surveyed had received training on kitchen gardens. This correlates to a low number of households from our sample currently growing a kitchen garden: 0 in Makame, 1 in Ndedo, 5 in Ngipa, 7 in Engusero, and 15 in Matui. The fact that there are more kitchen gardens in Matui is consistent with the greater food security experienced there in comparison to Makame.

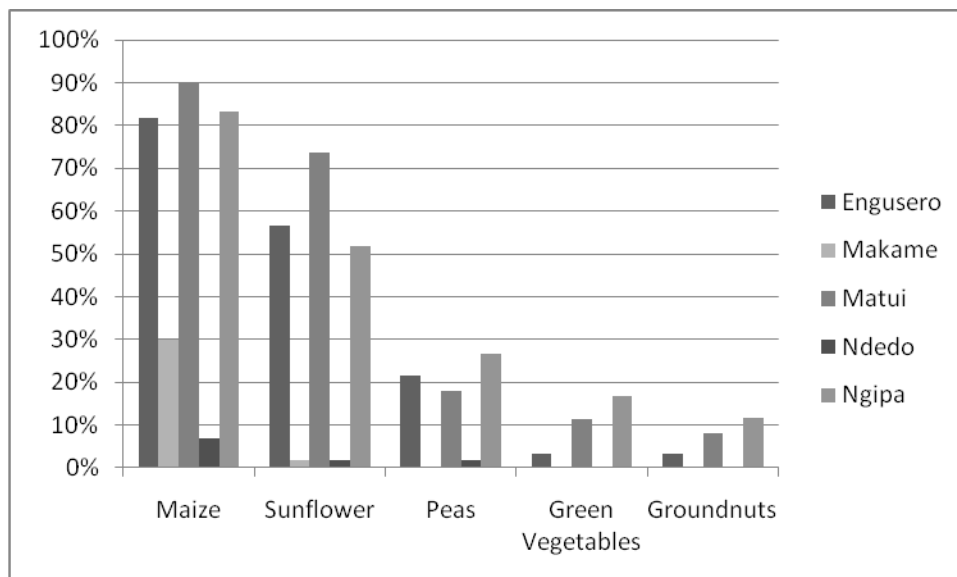
4.7 **Agriculture**

Farmers in Kiteto District are predominantly small-scale, subsistence farmers with a portion going towards cash crop production. The average land under cultivation per household is a between 4 and 12 acres per farm in each village. A portion of farmers rent land to farm in addition to the land they own. According to villagers participating in an agricultural focus group, nearly 100% of households own land without title.

Most households grow a diverse number of crops with varying proportions between the five villages as shown in Figure 17. Maize is the primary crop grown in each of the villages surveyed though the percentages of households that cultivate maize vary dramatically between villages. Sunflowers are the most cultivated crop after maize followed by peas, green vegetables, groundnuts, beans, and cassava. Among the five villages, a total of six households in the sample were growing any kind of fruit (mango and papaya). Guava is grown more commonly but it was not included in the survey.

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 45,000 TSH in Ngipa compared to 30,000 TSH in Matui.

Figure 13. 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 9.

Table 10. Qualitative Data on District Agricultural Environment

Village	% HH that Irrigate Plot	% HH using Fertilizer		% HH with Soil Erosion as Serious Problem
		Inorganic	Organic	
Engusero	0%	0%	3%	100%
Makame	0%	Not Answered	Not Answered	20%
Matui	0%	Not Answered	0%	90%
Ndedo	0%	Not Answered	Not Answered	Not Answered
Ngipa	0%	3%	2%	50%

Reasons for low use of organic fertilizers in Ngipa were reported as lack of soil understanding. Farmers in the communities surveyed indicated that they used intercropping and terracing to control erosion. Intercropping was a far more common method than terracing. Engusero and Ngipa had received visits from agricultural extension workers in the previous year while the other three villages surveyed had not. Farmers reported a lack of seeds, money to rent land to farm, water, farming equipment, and market. Additionally, low crop prices, heavy rains, and drought resulting in low income from cattle sold and thus lack of capital for farming, Destruction of crops by rodents and wild animals was reported in Makame.

4.8 Livestock

Overall, households in Ndedo own the greatest number of livestock while Engusero reports the lowest number of livestock owned per household. Households in Ndedo and Makame own more cows and goats/sheep than households in the other three villages surveyed in Kiteto District. Farmers in Ngipa and Engusero own the largest average numbers of chickens per household.

Table 11. Mean Number of Livestock Owned per Household by Village

	Cattle	Goats/Sheep	Chickens
Engusero	2.0	3.2	4.7
Makame	11.3	16.4	0.9
Matui	5.1	4.3	3.3
Ndedo	13.7	15.0	1.5
Ngipa	1.6	5.1	4.9

In the agricultural focus groups, farmers in Ndedo indicated that 40% of cows had been vaccinated but none of their goats; villagers in Ngipa reported 80% cattle but no goat vaccinations. In Matui and Makame no cattle or goats had been vaccinated in the past year. Both villages additionally reported there had been no visits from government agricultural extension workers in the past year. Data on cattle vaccination rates were not available in Engusero.

Ndedo reported four unpaid community animal health workers providing above-average services; Ngipa reported one government paid CAHW providing satisfactory services. Veterinary services were also reported available in Engusero.

No doubt as a result of low vaccination rates, significant numbers of animals were lost to disease, the highest numbers lost were reported in Makame (21%) and Engusero (20%). Drought struck cattle herds the hardest in Ndedo with 62% percent of cattle reported lost. Ndedo reported as a

result of diseases and drought 71% of cattle were lost followed by Makame with 48%. On average, 20% of goats in the five surveyed villages were lost due to disease.

On the other hand, both villages experienced a relatively high loss of chickens to disease. Engusero lost the highest percentage at nearly half their chicken population (46%). The lowest percentage lost to disease was reported by Ndedo farmers at 25%, still a high loss.

Newcastle Disease is the number one cause of chicken mortality in Tanzania yet despite this few chicken-owning households vaccinated against the disease: 10% in Engusero, 2% in Makame, 8% in Matui, 6% in Ndedo, and 14% in Ngipa.

Human-Wildlife Conflict

Qualitative data on human-wildlife conflict were collected through FGDs with men and women, and key informant interviews with village leaders. Crop destruction, loss of livestock, and human injury due to wild animals are the most common form of human-wildlife conflict according to men, women, and village leaders. Villager leaders feel this conflict stems from the close proximity of the farmland to the protected areas and the animals leaving the protected areas in search of food and water. Animals travel increased distances in search of food and water in times of drought. According to respondents in Ndedo, TANAPA took no action in response to reported wildlife-human conflict, namely human death.

5 CONCLUSIONS

5.1 Recommendations

There is significant range between the five village profiles. As district and village leaders review these results, it would be meaningful for them to consider how best to increase access to government services in villages. 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 Kiteto 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

	Kiteto District				
	Engusero	Makame	Matui	Ndedo	Ngipa
THE HOUSEHOLD AND HOUSING					
Number of households surveyed	60	60	61	59	60
Average household size	5.7	6	5.5	5.6	5.4
% households in polygamous marriage (more than 1 wife)	20	41.7	16.4	62.7	26.7
% of households headed by women	11.7	29.8	10	44.6	14
% of households with corrugated roof	95	18.3	88.5	18.6	71.7
% of households using a toilet	85	0	91.8	32.2	81.5
Avg time (minutes) required to collect water	44.3	196.5	45.5	100.4	47.5
% households use firewood as primary energy source for cooking	83.3	98.3	96.7	98.3	100
EDUCATION					
% of all adults without education	27.9	67.3	26.8	65.7	23.8
% of household heads completed primary school	61.7	17.5	50	16.1	47.4
% of adult men completed primary school	66	20	53.7	19.4	46.9
% of adult women completed primary school	28.6	11.8	16.7	12	59
Number of primary schools	3	1	3	1	1
Number of secondary schools	0	0	1	1	0
Average primary school textbook to student ratio	1:13	1:7	1:5	1:4	2:3
Average secondary school teacher to student ratio	Not applicable	Not applicable	1:47	1:207	Not applicable
Average # of years teachers stay at primary school	9	5	6	9	9
Average # of years teachers stay at secondary school	Not applicable	Not applicable	6	2	Not applicable
Ratio of female to male gross enrollment rates (primary school)	295:331	135:312	220:197	217:424	31:36
Ratio of female to male gross enrollment rates (secondary school)	Not applicable	Not applicable	99:81	120:294	Not applicable
HEALTH					
% of households with at least one mosquito net	76.7	83.3	93.4	100	74.6
% of households with access to protected drinking water	10	1.7	0	18.6	40
% of households that take measures to make the water safe	76.7	21.7	47.5	32.2	38.3
CHILDREN UNDER 5					
Average age in months at introduction of complementary feeding	5.5	8	6.6	8.6	7.2
% of children whose birth mother is still alive and inside the HH	100	90.5	94.4	96.1	95.9
% of children moderately to severely underweight	0	11.1	7	2	2
% of children who are vaccinated for BCG	100	98.4	98.6	100	91.8
% of children who are vaccinated for polio	98.4	96.8	98.6	92.2	93.9
% of children who are vaccinated for DPT	98.4	98.4	95.8	96.1	89.8
% of children who are vaccinated for measles	75.8	76.2	80.6	72.6	71.4
% of children received Vitamin A supplement	72.6	69.8	79.2	68.6	55.1
AIDS KNOWLEDGE					
% of men with high AIDS knowledge score (5-6 points)	87.5	50	81.8	100	81.3
% of women with high AIDS knowledge score (5-6 points)	76	37.5	62.5	75	81.3
% of women who know that a person can protect themselves from HIV	91.8	100	100	89.2	89.7
% of men who know that a person can protect themselves from HIV	93	100	100	100	93.3
% of men who have talked with their wife/primary partner about ways to prevent AIDS	84.2	71	86.2	90	75.9
% of women who have talked with their husband/primary partner about ways to prevent HIV/ AIDS	61.1	33.3	54.6	49	50
FOOD SECURITY AND NUTRITION					
% of households worried about food in the past 4 weeks	63.3	95	71.7	82.1	68.3
% of households ate limited variety of food in the past 4 weeks	81.7	93.3	86.7	85.7	85
% of HHs went one day and night with no food in the past 4 weeks	10	80	13.3	46.4	11.7
% of households that are currently growing kitchen garden	11.7	0	25	1.8	8.3
Avg # of days/times HHs ate meat protein in past week	1.8	1.25	1.4	1.3	1.9

Avg # of days/times HHs ate legumes in past week	1.5	0.3	1.2	0.9	1.9
Avg # of days/times in last week HH ate foods with Vitamin A	2.7	0.1	1.8	0.8	2.1
# of different types of food eaten in last week	6.1	2.6	5.5	3.3	6.1
Food Insecurity Index (1 is low and 9 is high insecurity)	3.6	7.8	4.5	6.1	4.1
ECONOMIC ACTIVITY, AGRICULTURE AND INCOME					
% households own any agricultural land	75	88.3	60.7	74.6	81.7
Average acres cultivated per household	11.6	5.3	8.1	3.9	9.4
Average # of cattle owned per household	2	11.3	5	13.7	1.6
Average # of goats/sheep owned per household	3.2	16.4	4.3	15	5.1
Average # of chickens owned per household	4.7	0.9	3.3	1.5	4.9
% of HHs whose chicken are vaccinated for Newcastle disease	10	1.7	8.2	5.1	20.7
% of cattle lost to disease in the past 12 months	13.2%	18.4%	4.3%	16.1%	15.7%
% of cattle lost to drought in the past 12 months	1.1%	25.5%	9.8%	24.3%	1.8%
% of cattle lost to wildlife in the past 12 months	0.0%	5.2%	0.2%	4.3%	0.0%
% of chickens lost to disease in the past 12 months	46.1%	30.8%	41.9%	25.3%	34.9%
% of chickens lost to drought in the past 12 months	0.0%	1.5%	0.0%	0.0%	0.0%
% of chickens lost to wildlife in the past 12 months	9.3%	35.6%	5.2%	3.7%	5.1%
% of goats/sheep lost to disease in the past 12 months	28.0%	25.9%	17.2%	29.4%	21.3%
% of goats/sheep lost to drought in the past 12 months	0.0%	12.1%	4.3%	12.5%	1.0%
% of goats/sheep lost to wildlife in the past 12 months	0.0%	9.4%	0.7%	3.8%	6.8%
% of household heads with the main occupation of farming	86.7	21.1	93.2	14.3	79
% of HH heads with the main occupation of livestock keeping	0	70.2	5.1	71.4	14
% of HHs that irrigate the plots in village (from focus group data)	0	0	0	0	0
% households with bicycle	68.3	31.7	75.4	18.6	38.3
% households with radio	71.7	10	59	22	46.7
% households with cell phone	43.3	13.3	26.2	13.6	21.7
KEY INSTITUTIONS					
% of HHs that participated in village assembly in past 12 mo	24.5	20	13.1	8.5	16.7
% of HHs in village government or committee in past 12 mo	22.6	8.3	24.6	15.3	21.7
% of HHs that asked village leaders for assistance in past 12 mo	83	58.3	63.9	30.5	71.7
DEMOGRAPHICS					
Religion (% Christian; % Muslim; % Traditional)	43.4;56.61; 0	0;95;5	44.3;54.1; 1.6	3.4;88.1;6. 8	21.7;70;8.3
Dependency Ratio (# of child (0-14 years) and aged (65+) population per 100 intermediate age (15-64 years)	1.2	1.7	1.3	1.6	1.2
Child-Woman Ratio (# of children aged 0-4 years per 1,000 women in the age group 15-44 years)	1	1.5	1.3	1.4	0.8
Sex Ratio (# of males per 100 females)	0.9	1.2	1	1.3	1