UNIVERSITY OF MINNESOTA

The Whole Village Project

Village Reports for Mbushi, Iramba Ndogo, Sapa, and Makao in Meatu 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 Mwang'halanga and Runele villages, Kwimba 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 Meatu District: Mbushi, Iramba Ndogo, Sapa and Makao. 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 strengths that were observed among the four villages. First, there is a relatively high vaccination rate among children under-five. Second, there is widespread knowledge of HIV prevention methods indicated by the scores on HIV Prevention Knowledge tests. Third, livestock in the villages tend to be well protected and healthy. Lastly, village proximity to wildlife conservation and management areas enables unique circumstances to supplement income generating opportunities.

Approximately, 80% to 90% of all young children received vaccinations for BCG, Polio, and DPT. High vaccination rates and a majority access to the nutrients from green vegetables are essential to child development.

HIV Knowledge scores reflect the overall awareness of prevention against the disease. Test results show that the average scores, on a scale of 6, were 5 in Makao, 4.94 in Mbushi, 4.87 in Sapa and 4.64 in Iramba Ndogo. Not only do most adults, 58% to 76%, have high scores but less than 10% of all adults received low scores. While there is a slight gender variance in the scores, overall awareness of HIV prevention methods is fairly high relative to other districts.

Households that own certain livestock (cattle and goats or sheep) tend to have large numbers and few households reported problems with disease or drought. The average number of cattle owned per household is at a low of 11.77 in Sapa and as high as 45.11 in Mbushi. The range of goats or sheep owned per household is also relatively high, ranging from 18.85 to 34.35. 70% to 100% of cows have been vaccinated against a number of diseases in Iramba Ndogo, Sapa and Mbushi; although very few were vaccinated in Makao (3%). Overall, 3% to 12% of cattle and 7% to 11% of goats or sheep were lost due to disease which are low figures compared to other districts.

Villages in Meatu district have a number of companies and organizations that provide revenue and infrastructure building projects that benefit the residents. Makao in particular has 7 wildlife

conservation organizations that generate income for the community. Sapa and Mbushi benefit from companies that purchase cotton from farmers that can supplement subsistence livelihoods with cash crop sales. While there are some disagreements and problems associated with outside companies and organizations, their presence provides additional income for residents.

3.2 District Gaps

There appears to be a relatively low level of education throughout the district. While 48% to 58% of adults completed primary school, 27% to 36% have received no education at all. The difference in gender is particularly acute as fewer women than men completed primary school. The largest gap is in Iramba Ndogo in which 66% of men and 48% of women have a primary education. Such low levels of education can have a profound impact on the villages' economic productivity, food security and general health. School quality is often referred to as low, given a general lack of infrastructure and a shortage of teachers. For example, there are as many as 155 students per teacher and 103 students per classroom in Iramba Ndogo. The best case situation was in Mbushi in which there 64 students per teacher and classroom. Survey participants also noted a lack of sanitary equipment in the schools and food was generally not provided for students.

Access to quality drinking water is another serious issue, particularly for Mbushi, Iramba Ndogo and Sapa. Residents from those three villages report that they obtain water from unclean sources such as surface water or an unprotected well. Residents in Makao note that 35% get water from a public tap and 33% from a protected well as it is the only village in which the majority have clean water access. The lack of residents taking measures to make water safe exacerbates the situation as only 27% to 47% do anything such as boiling water. This lack of sanitary water can have profound effects on public health in the area. Finally, the average time necessary to obtain water is fairly high, particularly in Mbushi and Sapa in which the average times are 134 minutes and 120 minutes respectively.

There is also a severe lack of toilets in the district. While 32% in Iramba Ndogo and 45% in Makao have no toilet, over half in Mbushi (71%) and Sapa (57%) also do not have one present. With the exception of 2% of households in Makao, no respondent has a flush toilet and those who do have a toilet have a pit latrine. Such conditions can pose a major health challenge by contaminating water and food sources.

Newcastle disease is the top threat to chicken herds in Tanzania. Despite this danger, very few households with chickens vaccinated against the disease. For instance, only 4% of chicken owners in Iramba Ndogo and Mbushi and 2% in Sapa and Makao vaccinated their chickens. The percentage of chickens lost to disease is considerably higher than other livestock at 16% to 29% of the herd.

3.3 Opportunities

There are a number of opportunities for improving public health among the villages. While less than half of households take any measures to improve water quality, such information on methods and health costs can be disseminated to increase that percentage. Also, the already high percentage of vaccinations for young children is a strong basis to push toward full vaccination for the villages. While most households own mosquito nets, approximately half own nets treated with insecticide. It is possible to not only increase coverage but also to treat more existing nets to improve their effect. As malaria is one of the most commonly cited disease from qualitative surveys, increasing the number of households with nets can have positive ramifications for health in the district. Finally, the high HIV Prevention Knowledge scores suggest a strong basis for combating the spread of the disease. Villages in Meatu district are in a position to witness universal awareness of prevention methods.

The socioeconomic impact of education could have a tremendous boost for the villages. Improving or expanding school infrastructure and hiring more teachers is an important step toward enhancing the livelihoods and opportunities for residents. Village education committees have an opportunity to develop solutions to shortages of space and teachers that hinder the educational development of children. As a number of respondents note that NGOs in the village have provided or promised funding for development of the education sector, a relationship is already in place for school improvements. Working together to create new agreements and solutions to existing problems in the schools may lay the foundation for future prosperity.

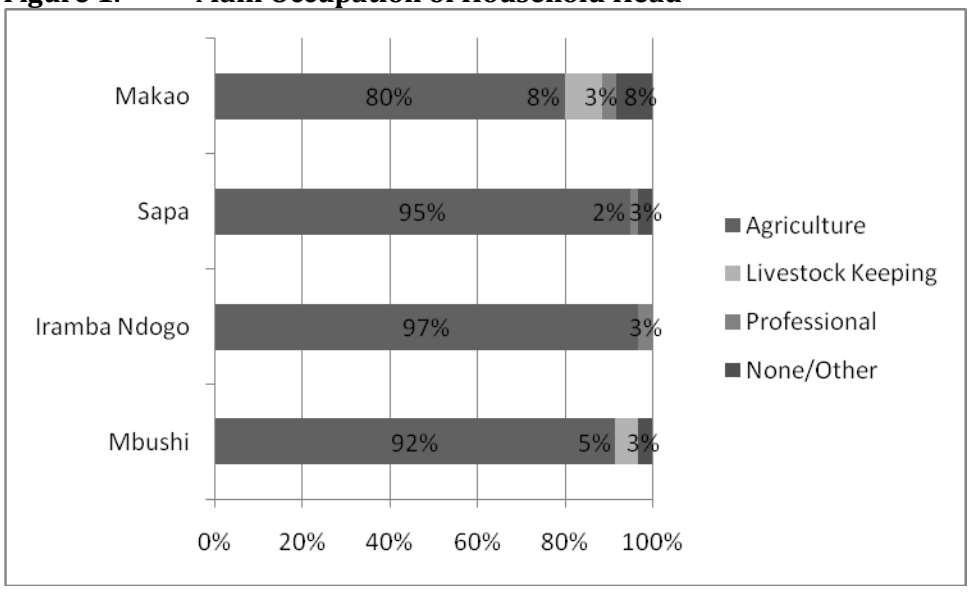
While some villages state that vaccination for livestock is difficult to procure, the high levels of vaccinations for cattle and goats or sheep show that important sources of food can be well protected. Increasing livestock vaccination rates can further reduce the rate of cattle and goats lost to disease, which is already low. Moreover, no chickens were vaccinated against Newcastle disease. Therefore, even a small increase can vastly enhance the health of chickens, protecting another important food source.

4 RESULTS AND DISCUSSION

4.1 Household Livelihood and Assets

The majority of surveyed household heads are primarily farmers. Over 90% in Mbushi, Iramba Ndogo and Sapa focus on farming while 80% do so in Makao (see Figure 1). Other occupations including livestock keeping and professional work account for no more than 12% of household livelihood sources. While livestock keeping is not a common primary occupation, the majority of households report owning cattle, sheep, goats and chickens. Makao households tend to own fewer cattle, sheep and goats with nearly 20% of respondents citing ownership.

Figure 1. Main Occupation of Household Head



Few households are headed by women in Mbushi (19%), Sapa (15%), Makao (14%) and Iramba Ndogo (12%). Farming remains the most common occupation of household heads when disaggregated by gender. However, women are more likely to focus on agriculture in Mbushi, Iramba Ndogo and Makao while men are more likely to do so in Sapa.

Qualitative surveys show that between 90 to 100% of farmers sell cash crops such as cotton, green gram, sim sim and groundnuts. Moreover, village leaders in Iramba Ndogo, Mbushi and Sapa note that cash crops constitute the most common livelihood source. Subsistence farming is listed as the second most common source in Sapa. Livestock keeping, small business and tourism are also mentioned as top income generating activities.

Focus group discussions facilitated with men, women and village leaders investigated activities that could improve the livelihoods of village members. Table 1 displays recommendations by participant type by village.

Table 1. Village Recommended Activities to Improve Local Livelihoods

Village	Men	Women
Mbushi	• Microfinance, Small Business • Sewing Machines • Beekeeping	• Microfinance, Small Business • Borehole • Sewing Machine
Iramba Ndogo	• Microfinance, Small Business • Borehole • Farming with Tractor	• Borehole • Microfinance, Small Business • Sewing Machines
Sapa	• Microfinance, Small Business • Beekeeping • Borehole	• Borehole • Sewing Machines • Education
Makao	• Education on Agricultural Practices • Microfinance • Sewing Machines	• Microfinance • Sewing Machines • Vegetable Farming

Microfinance is the most consistently recommended activity among men and women. However, other sources such as beekeeping, drilling boreholes, sewing machines, agricultural tools and increasing the bushmeat supply are mentioned throughout the villages. Small business and tourism, though not common, are considered important income sources for the villages. It is not surprising that the list of recommended activities includes a number of business tools for production and investment. Moreover, respondents in Iramba Ndogo and Sapa note that farming is not an option for many because of a lack of farming equipment.

Ownership of certain material goods and assets acts as a proxy indicator of a household's socioeconomic status. Households in the four villages were asked whether they owned a bicycle, radio and cell phone. While almost the majority of households own a bicycle in all four villages, less than half own a radio or cell phone. Iramba Ndogo boasts the highest percentage of households that own a bicycle (80%) and cell phone (43%). Makao tends to have the fewest assets among households in terms of bicycles (40%) and radios (33%). However, Makao has the highest proportion of households with at least one cell phone at 43%. Overall, one in three households among all four villages own a cell phone or radio while nearly two in three own a bicycle.

The majority of houses among the villages are built with natural materials, with mud brick walls, earth or clay floors, and mud and straw or grass roofs. Only Makao had any houses with a cement

floor, accounting for 6% of houses. Makao also has the highest percentage of houses with a corrugated metal roof at 43% of houses compared to 28% in Iramba Ndogo, 23% in Sapa and 12% in Mbushi. Over half of houses in Mbushi, Iramba Ndogo and Sapa have roofs made of mud, grass and straw.

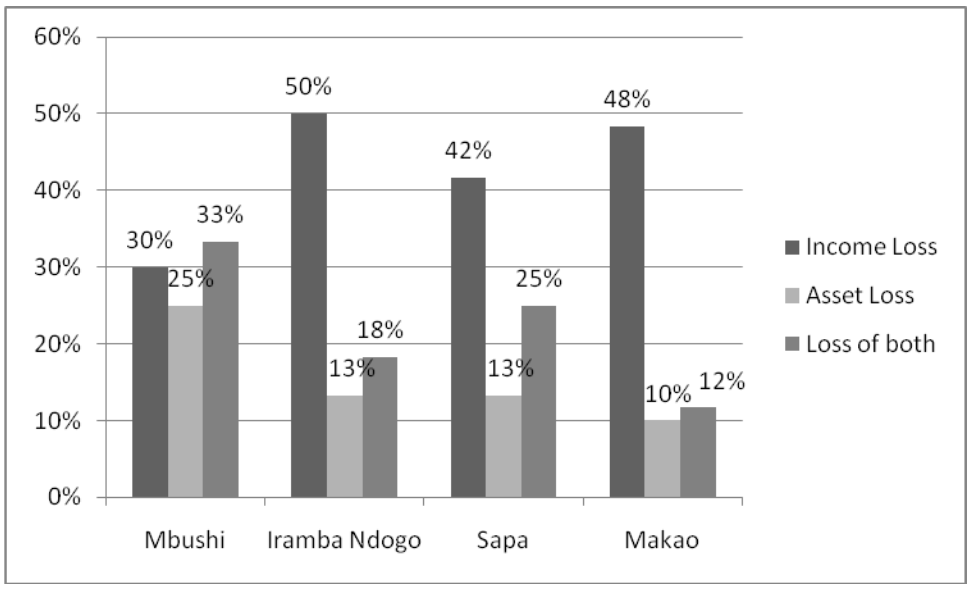
We have created a wealth index based on holdings of 30 non-livestock assets and characteristics of these assets (such as house building materials). The index assesses "wealth" or assets within the domain of Whole Village Project villages surveyed to date (48 villages). Household or village assets are scaled to compare to one another but not to a national standard of income or assets. The index scale ranges from zero to 15 with zero being no wealth. The average scores of the four villages are fairly low with Iramba Ndogo having the highest at 3.4 followed by Mbushi (3.0), Makao (2.9) and Sapa (2.7).

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.

When we asked households in Mbushi, Iramba Ndogo, Sapa and Makao about unanticipated income or asset losses it became apparent that the villages as a whole were coping with significant economic losses this year due to substantial crop loss and severe water shortage (see Figure 2). 54 to 76% of respondents who suffered an unexpected loss in the four villages cite weather (likely due to drought) that resulted in crop and income loss. While losses are significant in all villages, nearly all residents in Mbushi (97%) note an unexpected loss. Reported losses are not substantially lower in Sapa (90%), Iramba Ndogo (87%) or Makao (77%).

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. Twenty-nine percent of respondents in Nduguti reported both income and asset loss; the percentage of both income and asset loss was slightly less in Nkinto at 25%.

4.3 Village Institutions

Table 2 presents a picture of the institutional analysis conducted in the villages surveyed in Meatu 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 3, 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 2. Institutional Resources by Village

Institution	Mbushi	Iramba Ndogo	Sapa	Makao	Sector
Village-Run					
Community Health Worker	x				Health
Education	x	x	x	x	Education
Health Service	x	x	x	x	Health
Religious Institution (church, mosque, etc.)	x	x	x	x	Religion, Social Welfare
Village Council /Government	x	x	x	x	Politics/Government
Village Market	x	x	x		Business Development
Community/Publicly Owned Water	x				Water
Sub_Total Village-Run	**7**	**5**	**5**	**4**	
Village Committee/Group					
Farmers Coop	x		x		Agriculture, Financial/Socioeconomic
Security Committee	x		x		Legal, Civil Service
Energy Committee	x				Energy/Environment
Sub Total Village Committee/Group	**3**	**0**	**2**	**0**	
Non-Governmental Organizations					
Adventures in Health, Education and Agricultural Development (AHEAD)		x			Aid/Development
CARE		x			
Community Conservation Banks (COCOBA)			x		Financial/Socioeconomic
Community Development Support (CDS)		x			Financial/Socioeconomic
District Agricultural Sector Investment Project (DASIP)	x				Farming/Agriculture
Frankfurt Zoological Society (FZS)	x	x	x	x	Wildlife/Conservation

Institution	Mbushi	Iramba Ndogo	Sapa	Makao	Sector
Friedkin Conservation Fund (FCF)			x		Wildlife/Conservation
Makao Tours and Hotel				x	Wildlife/Conservation
Maswa Game Reserve				x	Wildlife/Conservation
Mwiba Holding				x	Wildlife/Conservation
Ndutu Lodge				x	Wildlife/Conservation
Ngorongoro Conservation Area				x	Wildlife/Conservation
Robin Hurt Hunting Safaris Company	x	x		x	Wildlife/Conservation
SACCOS		x			Financial/Socioeconomic
TASAF	x	x	x		Social Welfare, Financial/Socioeconomic
Sub Total Non-Governmental Organizations	**4**	**7**	**4**	**7**	
TOTAL	**14**	**12**	**11**	**11**	

All four villages have similar numbers of institutions though there are large variations in the types of institutions. Among village run institutions, health, education, governance and religious institutions are present in all villages and all but Makao have a village market. Generally, village governments are heavily criticized for having poor relations with residents. Focus Group participants from Sapa, Iramba Ndogo and Makao note that government revenues and expenditures are not sufficiently reported to the people. There is also consistent reference to poor supervision of village development and resources. Perspectives on health and education services, while widely appreciated, tend to focus on a lack of or deteriorating infrastructure and educated and experienced personnel.

Village committees or groups only exist in Mbushi and Sapa. The village security group in Sapa, while "providing security for people and property" and helping to "control environmental destruction," was also found to step beyond its boundaries and could improve its relationship with the residents. The agricultural coop provides farmers a medium in which they sell cotton but generally receives negative reviews. Fluctuations in cotton prices or not purchasing cotton at all were consistent themes from both villages.

The NGO presence is particularly large in Iramba Ndogo and Makao. Meatu district's proximity to wildlife conservation and management areas results in a large number of organizations that focus on wildlife. All NGOs in Makao are related to wildlife conservation and are credited with providing revenue, machines and buildings (health and education) to the village. However, there appears to be a disconnect between the companies or organizations and the residents, who note that they are not receiving employment. Other benefits from NGOs such as Frankfurt Zoological Society that helped establish microcredit groups and promote environmental protections. While a number of other projects (such as soap and candle making training, road construction, school or well construction) were promised to residents, many feel that progress is either too slow or nonexistent.

4.4 Education

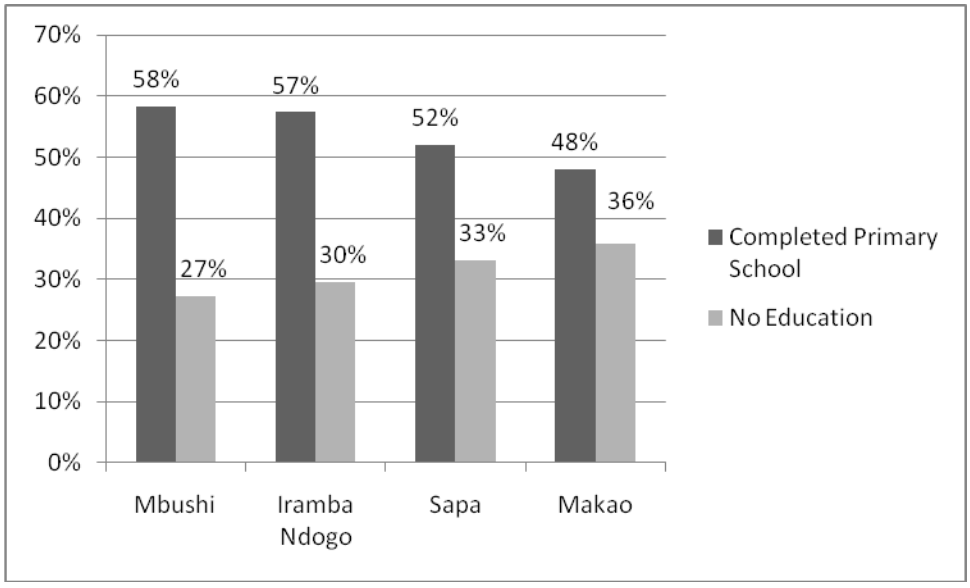
4.1.1 Household-Head Education

The data indicates a significant gap in education levels among household heads for all four villages. Overall, less than half, approximately 44%, of household heads completed primary school while 37% have no education. Moreover, only 3% received any secondary education and 4 out of 238 household heads completed Form 4. The primary school completion level among household heads is fairly consistent among the villages from 40% in Mbushi to 48% in Sapa. Village differences for those with no education have a similar spread with a low of 30% in Mbushi and a high of 42% in Iramba Ndogo.

4.1.2 Primary School Completion

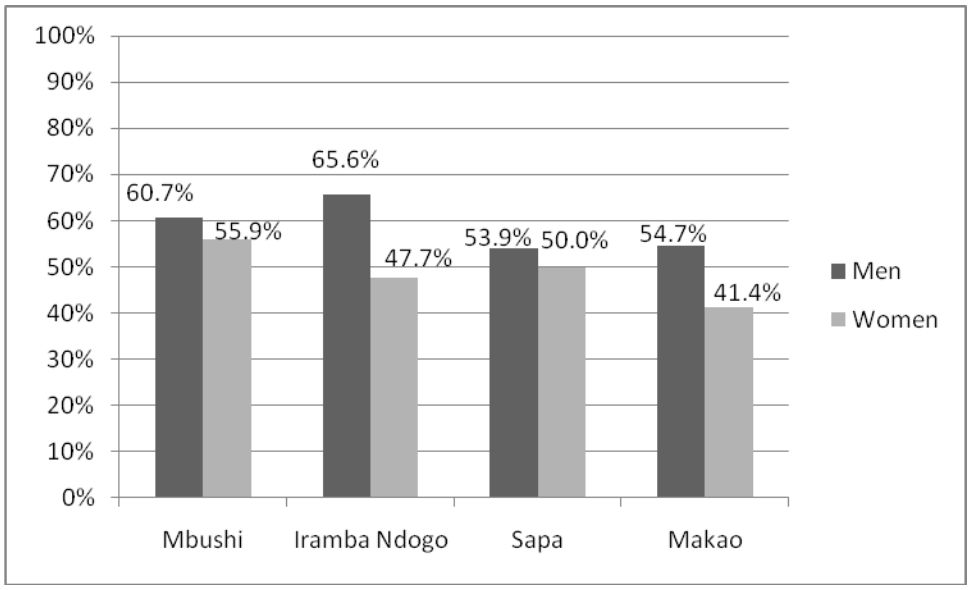
Figure 3 shows the percentage of adults (aged 15 years or more) who have completed primary school and those who have received no education. While over half of adults in Mbushi, Iramba Ndogo and Sapa (52% to 58%) have at least a primary education, less than half have attained that level in Makao (48%). However, one in four to one in three adults have no education in the villages, indicating a tremendous education gap in the district.

Figure 3. Percent Adults Completed Primary School versus No Education



Education levels for adult males are slightly higher than that of adult women. 60% of men and 49% of women have completed at least primary school. The gender gap among adults with no education is even more considerable. 39% of adult women have received no education which contrasts with 24% of adult men. Lack of education among women is especially acute in Makao as nearly half, 45%, have no education.

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



4.1.3 Access to Primary Education

Among the villages, Iramba Ndogo and Mbushi have two primary schools each; Sapa and Makao each have one primary school. None of the villages have a secondary school. Classroom to student ratios show that educational facilities may be inadequate, given the range from 1:61 to 1:103. The teacher to student ratio also shows signs of concerns, ranging from 1:51 to 1:155 (see Table 3).

While the majority of students regularly attend school, nearly 15 to 20% of students do not regularly attend. In one of the Mbushi primary schools the headmaster notes that 30% of its students do not attend regularly. The most common recommendation by headmasters for change included increasing the number of text books and teaching equipment such as test tubes.

Men's and women's focus group surveys frequently cite a need for more classrooms and facilities, teachers and teaching houses. While many are satisfied with the number of students who pass examinations, there appears to be a consistent opinion that infrastructure (including a bridge to attract more teachers) is needed.

Table 3. Primary School Environment

Village/School	Students Enrolled	Teacher to Student Ratio	Classroom to Student Ratio	Textbook to Student Ratio	% Teachers completed Form IV
Mbushi	532	1:106	1:89	1:3	100%
Mbushi (Shushuni Primary School)	254	1:64	1:64	1:4	100%
Iramba Ndogo	518	1:74	1:74	1:3	100%
Iramba Ndogo (Sungu Primary School)	619	1:155	1:103	1:4	50%
Sapa	487	1:97	1:97	1:3	100%
Makao	363	1:91	1:61	1:4	100%

Current school attendance among children (between 5 and 15 years) varies significantly by village. While 71% in Makao and 59% in Iramba Ndogo are currently in school, less than half are enrolled in Sapa (44%) and Mbushi (44%). Disaggregation by gender shows that in Sapa male children (37%) are less likely to be in school than female children (52%).

The physical condition or undernourishment of the student can have a profound impact on his or her learning ability and the return on investment in education. Among the four villages, the vast majority of students go to school without eating or only having tea. Moreover, four of the six primary schools provide no food for lunch (see Table 4). The two schools that provide lunch, one in Iramba Ndogo and one in Mbushi, give porridge and only in Mbushi is a fee for the food assessed.

Table 4. Percent of Students Attending Primary School Hungry

Village	% Students Attending School Without Eating Food or Having Tea Only	School Meals Provided
Mbushi	90%	No
Mbushi (Shushuni Primary School)	100%	Porridge for Lunch
Iramba Ndogo	100%	No
Iramba Ndogo (Sungu Primary School)	100%	Porridge for Breakfast and Lunch
Sapa	77%	No
Makao	100%	No

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 Meatu District was collected through focus group discussions with men and women. In all four villages, respondents ranked malaria as the number one ranked health issue facing men, women, and children (see Table 5). Among adults, foot and wrist pain and hernia were commonly cited. Children in Makao and Iramba Ndogo faced issues with diarrhea and malnutrition and dehydration problems for children in Mbushi.

Table 5. Top Ranked Health Issues for Men, Women, and Children

Village	Men	Women	Children
Mbushi	• Waist Pain • Bladder Blockage • Hernia • Malaria	• Waist Pain • Chest Pain • Malaria • Sore Throat • Stomach Ulcers • Eye Disease	• Malaria • Anemia • Malnutrition • Dehydration
Iramba Ndogo	• Food and Knee Aching • Waist Aching • Malaria	• Stomach Aching • Waist Aching • Malaria	• Malaria • Diarrhea • Small Pox • Ring Worm • Fever
Sapa	• Typhoid • Hernia • Waist Pain • Tuberculosis • Sexually Transmitted Diseases (STDs) • Bilharzia	• Urinary Tract Infection • Dizziness/Anemia • Tuberculosis • Waist Pain • Stomach Ache	• Malaria • Paralysis • Stomach Ache • Bilharzia
Makao	• Stomach Ache • Foo/Waist Pain • Malaria • Waist/Back Pain	• Malaria • Foot Itching/Swelling • Pneumonia • Malaria • Waist/Back Pain	• Malaria • Convulsions • Diarrhea • Vomitting

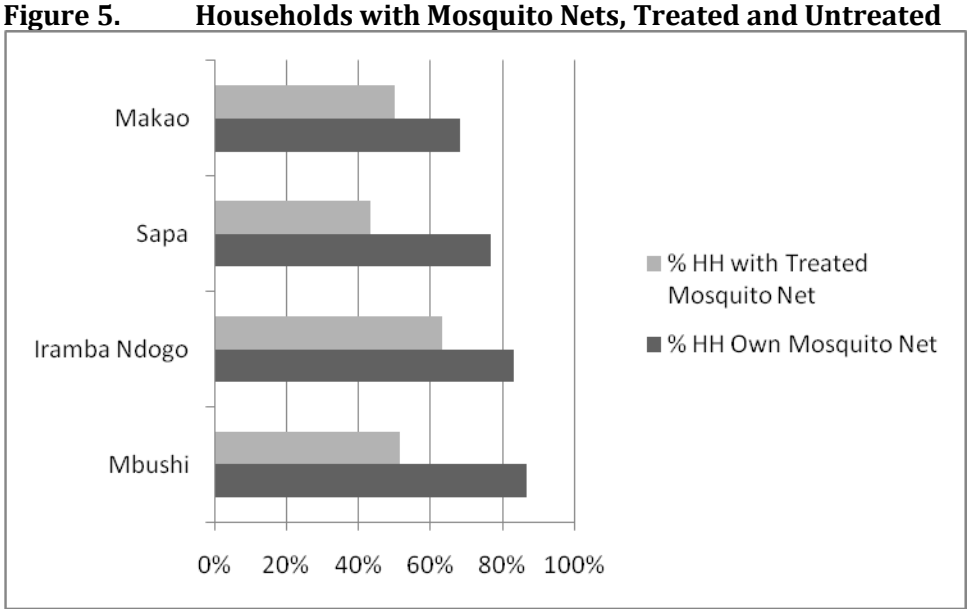
Mbushi, Makao and Iramba Ndogo have a dispensary in the village while Sapa does not list any type of health facility present. Mbushi is the only village to report having a medical officer present while Makao and Iramba Ndogo have a nurse assistant. The dispensaries in Mbushi and Makao have a refrigerator and both dispensaries provide family planning services. While there is no information of a clinic or dispensary in Sapa, 100% of respondents seek treatment for all diseases at a clinic, dispensary or hospital as well as Makao. This stands in contrast to Mbushi and Iramba Ndogo as many seek treatment for aches and pains by traditional healer. Moreover, respondents note that children's dehydration treatments are taken to traditional healers in Mbushi.

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, mosquito net ownership is fairly high in the surveyed villages. While Makao has the lowest percentage of mosquito nets among households at 68%, it has one of the highest percentages of nets that were treated at 73%. Mbushi and Iramba Ndogo both have over 80% of households with mosquito nets and Sapa has 77%. Overall, more

than half of all households have treated nets though Mbushi and Sapa have considerably less at 60% and 58% respectively.

Figure 5. Households with Mosquito Nets, Treated and Untreated



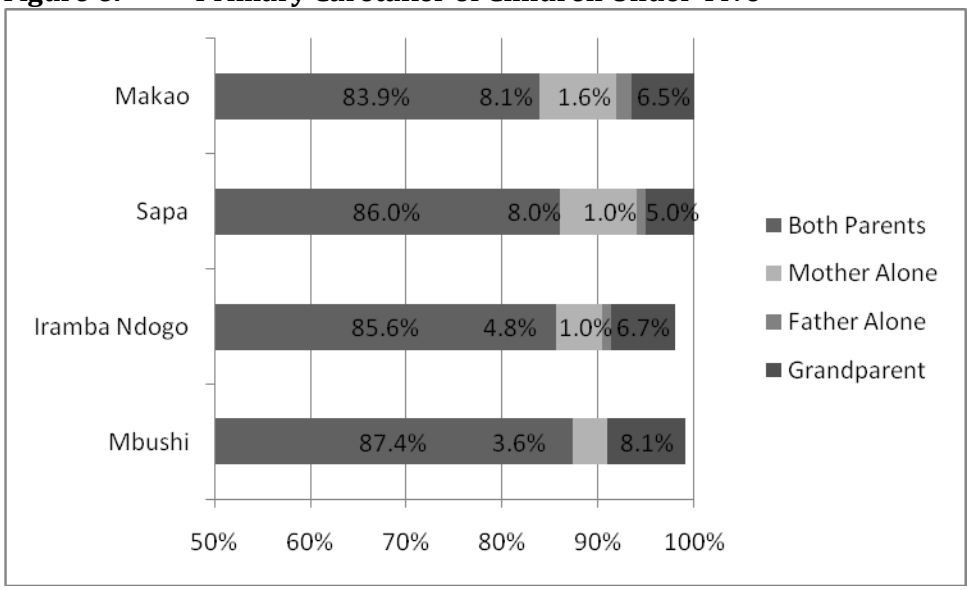
4.5.3 Under-Five Health Status

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. Between 92% to 98% of biological mothers live with the child and only 1% of households note that the mother is not alive in Mbushi, Iramba Ndogo and Sapa. While there were no reports of deaths among mothers in Makao, a higher percentage of households (8%) state that the mother lives outside of the household compared to 6% in Iramba Ndogo, 4% in Mbushi and 1% in Sapa. A significantly larger percentage of fathers do not live with the under five child although the majority do in Mbushi (89%), Makao (86%), Iramba Ndogo (81%) and Sapa (79%). Only Mbushi and Iramba Ndogo report father deaths (2 occurrences in each village). A significant portion of biological fathers live outside of the household in Sapa (19%), Iramba Ndogo (16%) and Makao (14%). Only 8% of fathers in Mbushi live outside the household. Generally, primary caretaking is handled by both mother and father in Mbushi (87%),

Sapa (86%), Iramba Ndogo (86%) and Makao (83%). In very few cases, primary guardianship may be the responsibility of the mother alone in 4% to 8% of the households. Others such as grandmothers constitute another 5% to 8% of primary caretaking (see Figure 6).

Figure 6. Primary Caretaker of Children Under-Five



Overall, child health in the surveyed villages is reportedly good. Only 10% of households state that a child is frequently sick in Sapa followed by 8% in Mbushi, 5% in Iramba Ndogo and 2% in Makao. However, every village notes that a child has been lost in the last two years. Mbushi faced the highest loss with 8 reported deaths and Makao had the fewest at 2 deaths.

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

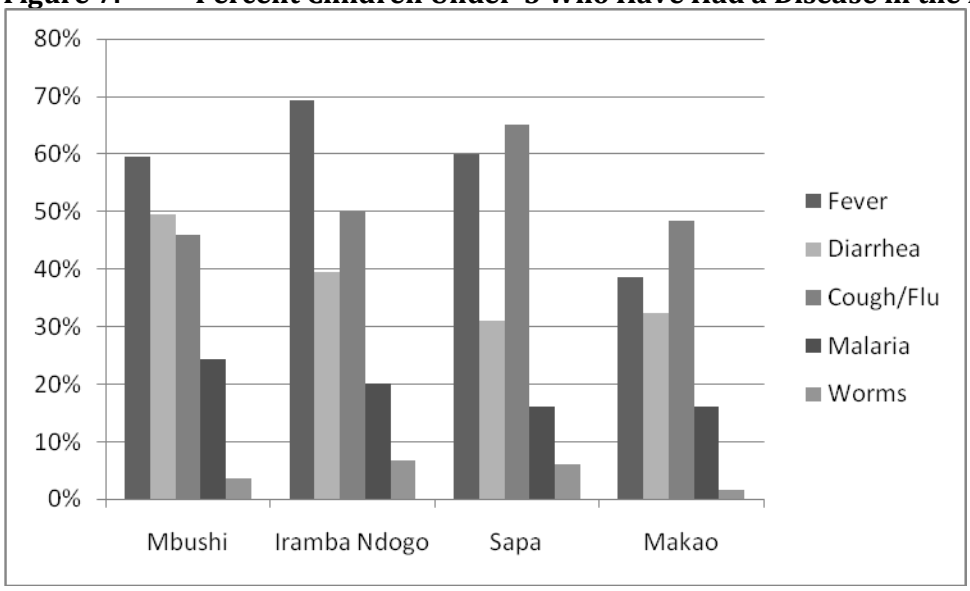
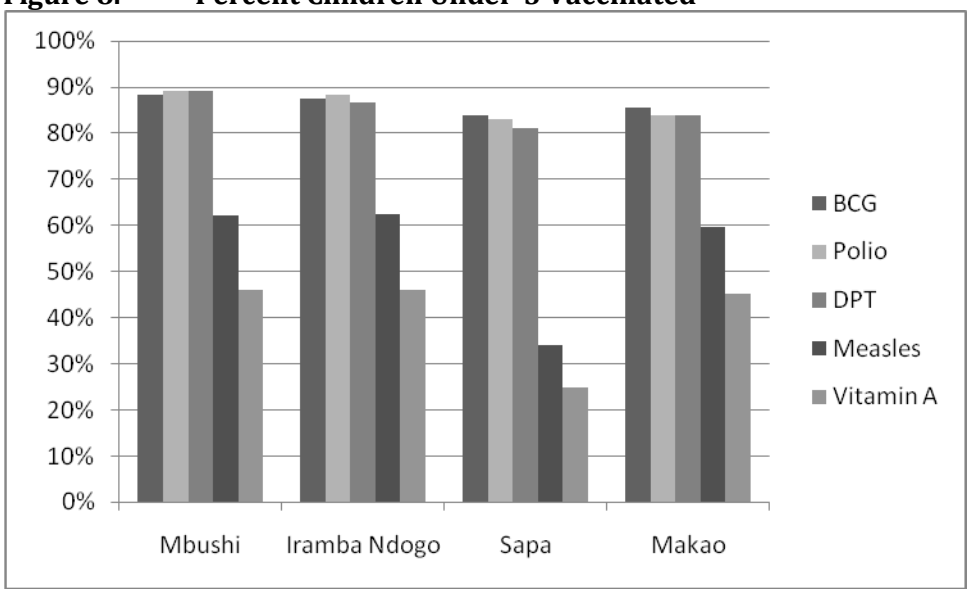


Figure 7 provides a summary of the disease burden for children under-five among the four villages. Over half of children suffered from fever or a cough or flu in the past three months in Mbushi, Iramba Ndogo and Sapa. Diarrhea was also a significant issue among the villages as between 31% in Sapa to 50% in Mbushi were afflicted. While far from the most common disease, there were a number of reports of malaria among under-five children in Mbushi (24%), Iramba Ndogo (20%), Sapa (16%) and Makao (16%). Other diseases such as measles and pneumonia were near nonexistent.

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 was also collected on percentage of children under five who had received a vitamin A supplement.

Figure 8. Percent Children Under-5 Vaccinated



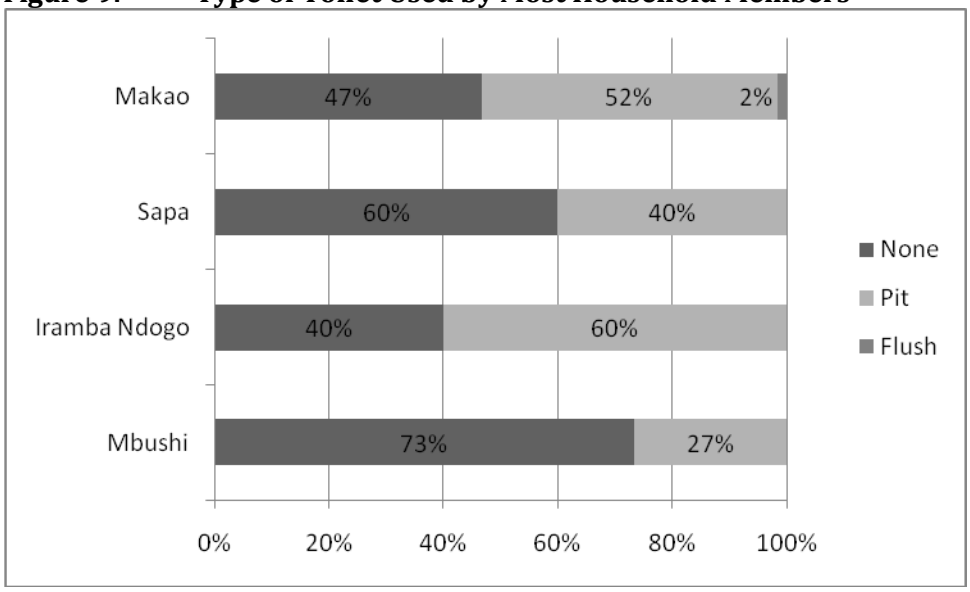
Vaccinations for under five children in Meatu district is fairly high though could be improved for BCG, polio and DPT. The data in Figure 8 shows that 80% to 90% of all villages vaccinated for those three diseases. However, the percentage vaccinated against measles is substantially lower. While Mbushi, Iramba Ndogo and Makao have administered vaccinations for approximately 60% of young children, Sapa lags far behind at 34%. Even fewer children received vitamin A supplements in all of the villages. Almost half of the under five children in Mbushi (46%), Iramba Ndogo (46%) and Makao (45%) had a vitamin A supplement, children in Sapa receive the lowest amount at 25%. It

should be noted that the data does not take into account the age of vaccination or number of doses; thus the number of fully vaccinated children may be even lower.

4.5.4 Environmental Health

Many infectious diseases, especially diarrheal diseases, can be a result of poor hygiene and contaminated water and food sources. An alarmingly large proportion of households reports having no toilet in Mbushi (71%), Sapa (57%), Makao (45%) and Iramba Ndogo (32%). Pit latrines are the most common toilet type and account for nearly all toilets in the villages except in Makao in which 2% of households have a flush toilet (see Figure 9).

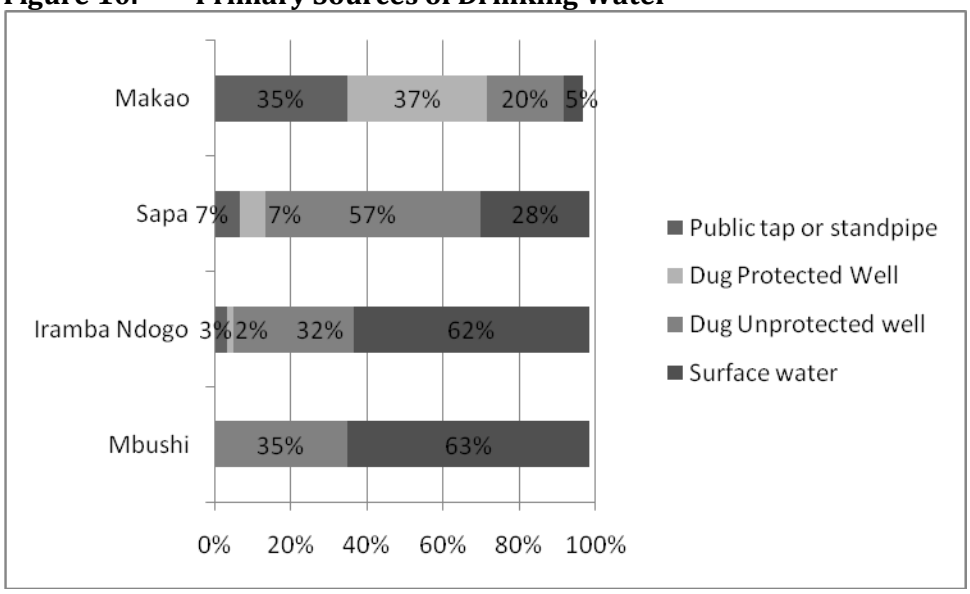
Figure 9. Type of Toilet Used by Most Household Members



Qualitative data indicates the primary modes of refuse disposal in Iramba District villages are to bury or burn refuse on a household compound.

Access to clean drinking water appears to be a significant problem in the villages. Mbushi, Iramba Ndogo and Sapa all have nearly non-existent access to clean water. Respondents in Mbushi (99%), Iramba Ndogo (92%) and Sapa (89%) report that they rely on either surface water or an unprotected well. Makao contrasts sharply with those villages as only 29% rely on surface water or an unprotected well. Moreover, 35% get water from a public tap and 33% from a protected well.

Figure 10. Primary Sources of Drinking Water



While having the highest level of access to clean water sources, residents in Makao are also more likely to take some measures (such as boiling) to make water safe. 47% report doing something to make water safer in Makao compared to Sapa (40%), Iramba Ndogo (30%) and Mbushi (27%). Water quality is either described as "muddy and salty" in Iramba Ndogo and Sapa or "clean and salty" in Makao and Mbushi from qualitative surveys. While Sapa also lists a clean water source from a borehole, surveys show that "few" households have accessibility. As many households rely on water that is not considered clean, the low percentage of those who take measures to make water is an area of concern.

The government of Tanzania defines adequate access to clean water as the ability to retrieve water under 30 minutes. Based on that definition, there is on average inadequate access in all the villages however, Makao has the best access of the villages. 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. Distance to water sources varies considerably by village. All households in Makao have access to a shallow well that is approximately 1 km away from the village. The distance to the nearest borehole from Iramba Ndogo is three times further at 3 km. The average distance of water sources from Sapa is 5 km and Mbushi residents have the longest distance to travel at nearly 16 km. These different distances seem to be reflected by the average time it takes to retrieve water among the villages.

Table 6. Average Time to Collect Water

Village	Minutes to Collect
Mbushi	134.24
Iramba Ndogo	93.45
Sapa	119.75
Makao	42.41

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. Firewood is almost exclusively used as cooking fuel in Mbushi (98%) and Iramba Ndogo (97%). Conversely, no household in Sapa lists firewood as fuel, instead relying on charcoal at 98% of respondents. In Makao, 8% use firewood and 92% use straw, shrubs and grass for cooking fuel.

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 66% women in Mbushi, 60% in Makao, 58% in Iramba Ndogo and 56% in Sapa. 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. 7 Sample Size of KAP Survey, by Sex

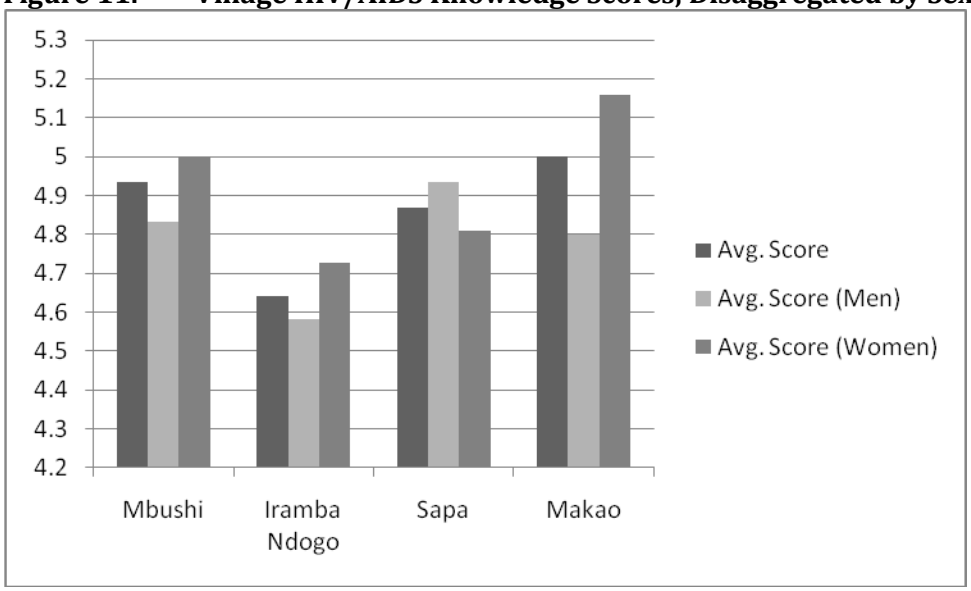
	Sample size		
Village	**Male (%)**	**Female (%)**	**Total**
Mbushi	40 (34%)	77 (66%)	117
Iramba Ndogo	51 (43%)	69 (57%)	120
Sapa	59 (44%)	74 (56%)	133
Makao	38 (40%)	57 (60%)	95

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

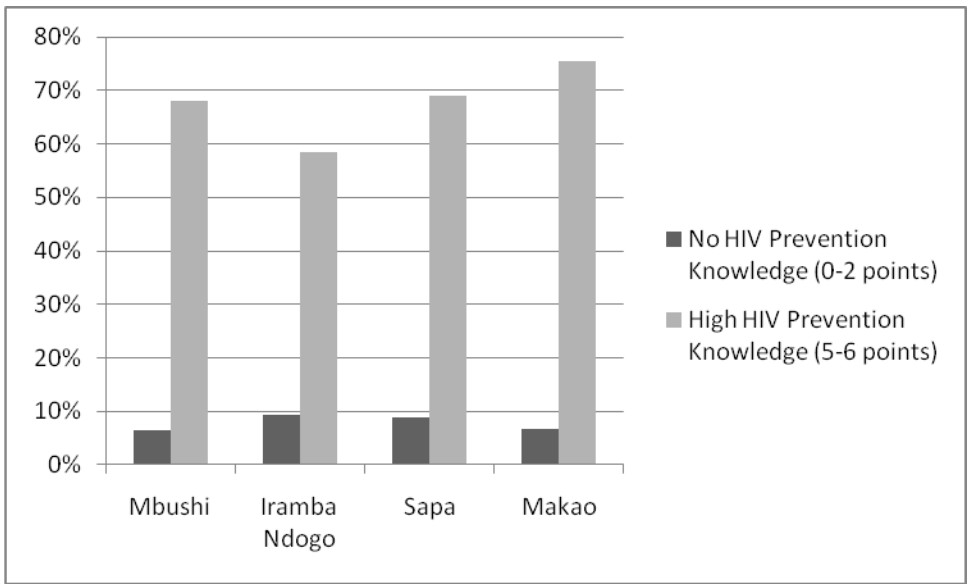


The figure shows that Makao respondents scored the highest on the HIV/AIDS score with an average score of 5 followed by Mbushi (4.94), Sapa (4.87) and Iramba Ndogo (4.64). Gender variations in the knowledge scores are considerable with women generally having higher averages except in Sapa where the opposite is the case. The average scores for men vary from 4.58 to 4.94 and average scores for women ranged from 4.73 to 5.16.

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.

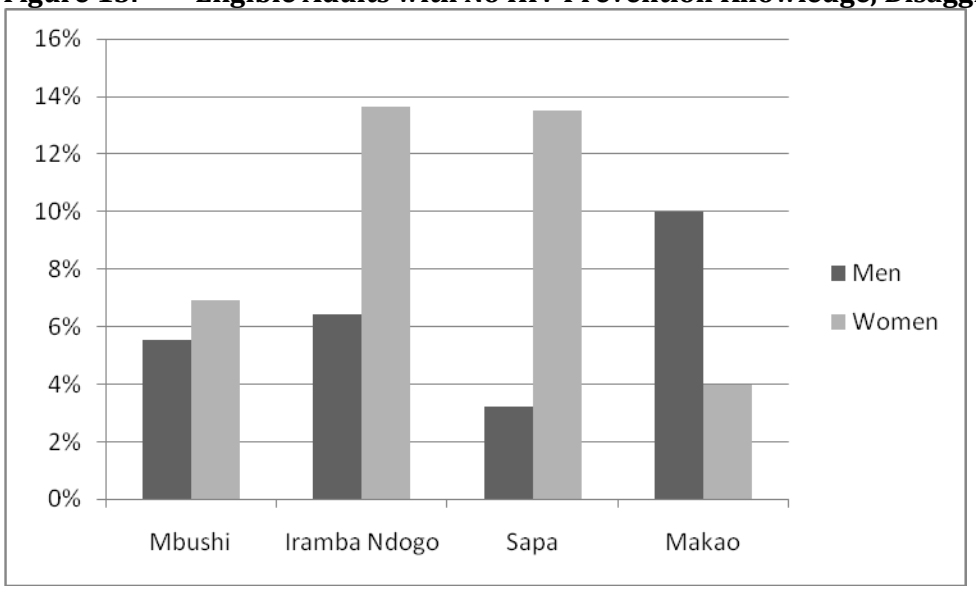
Since the responses that trigger these skip patterns imply lack of knowledge, skipped questions earn zero points. Therefore, those who say they have not heard of HIV/AIDS get a score of zero, while those who have heard of HIV/AIDS but report no knowledge of prevention measures receive a score between 0 and 2 based on their answers to questions numbers 5 and 6. As shown in Figure 12, the majority of adults have high prevention knowledge scores while very few have no knowledge. 58% to 76% of eligible adults scored either 5 or 6 while approximately 6% to 9% of all village residents scored between 0 and 2. The scores suggest that most residents are aware of some HIV prevention measures.

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



With the exception of Makao, women are more likely to have no HIV prevention knowledge than men (see Figure 13). Women in Iramba Ndogo and Sapa have the highest percent of eligible adult females with no knowledge at approximately 14%.

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



It is possible that some women deny knowledge of HIV prevention, possibly because they do not feel comfortable discussing it. It is impossible to know how much of the sex differences reported in Figures 11 and 12 result from this phenomenon versus actual lack of knowledge. Since the questions about prevention strategies are skipped if the respondent says s/he does not know if there are any ways to prevent HIV infection, such denial would artificially lower the overall knowledge scores of women.

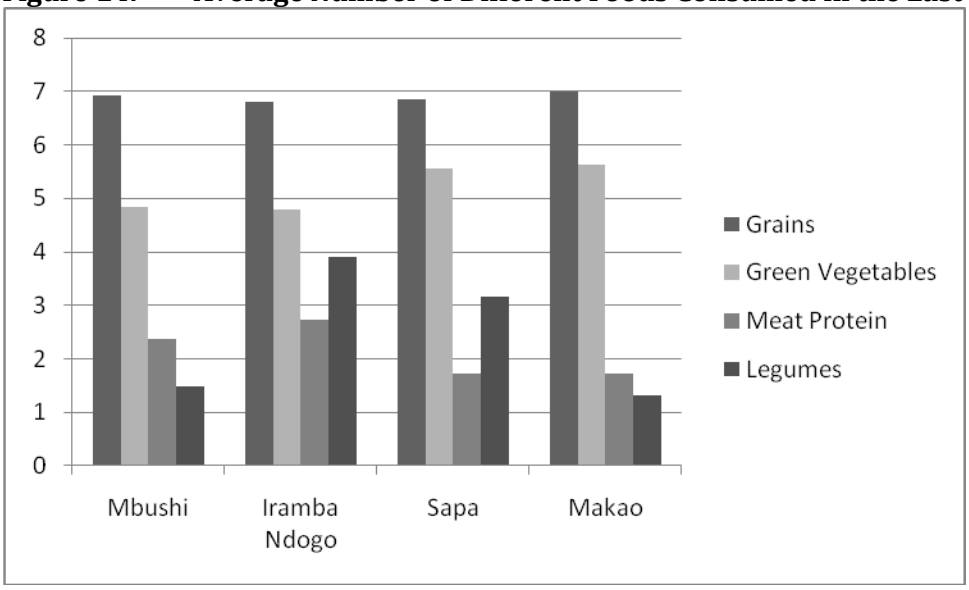
When asked if a respondent has ever been tested for HIV, the majority of residents in Mbushi (68%) and Makao (73%) reported yes while most in Iramba Ndogo (53%) and Sapa (56%) reported no. Women in Mbushi and Makao were more likely to have tested for HIV and men were more likely in Iramba Ndogo and Sapa.

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 4.20 to 5.62 different types of food in a week, ranging from 1 to 11 among surveyed villages. Grains and green vegetables are the most commonly consumed food in all four villages. Grains are eaten almost daily as residents state that they ate grains 7 times per week in Makao, 6.93 times per week in Mbushi, 6.85 times per week in Sapa and 6.82 times per week in Iramba Ndogo. Consumption of green vegetables ranged from 4.8 times per week in Iramba Ndogo to 5.6 times per week in Makao. Other food types such as meat protein and legumes were generally consumed 1 to 3 times per week (see Table 14).

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



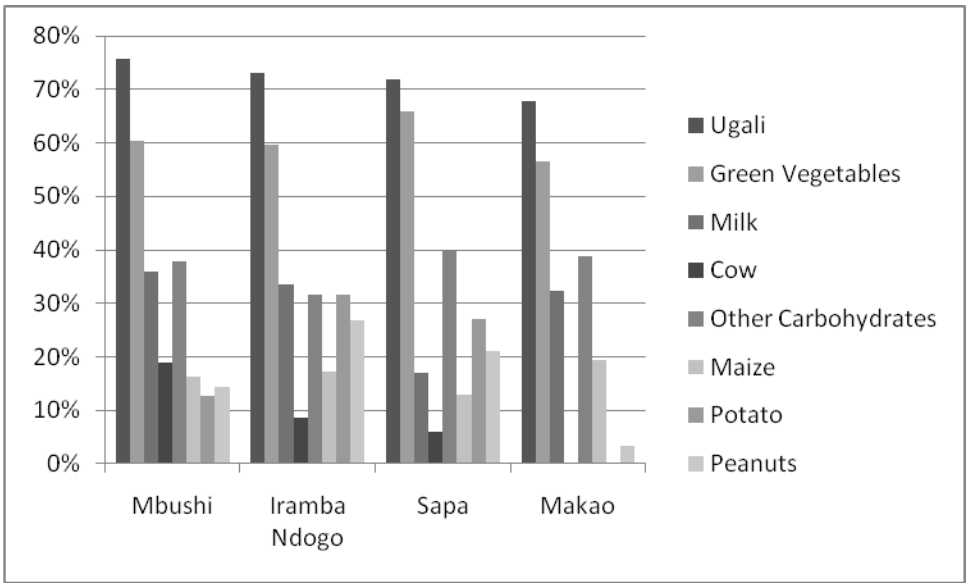
4.5.7 Infant and Young Child Feeding

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. All infants and young children were breastfed in the surveyed villages; however, between 11% and 18% were exclusively breastfed for their first 6 months. The plurality of infants stopped exclusive breastfeeding at more than 3 months and less than 6 months in Sapa (49%), Mbushi (47%), Iramba Ndogo (38%) and Makao (35%). On average, infants were weaned altogether at 21.5 months in Makao, 19.3 months in Sapa, 19.2 months in Iramba Ndogo and 19.0 months in Mbushi.

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



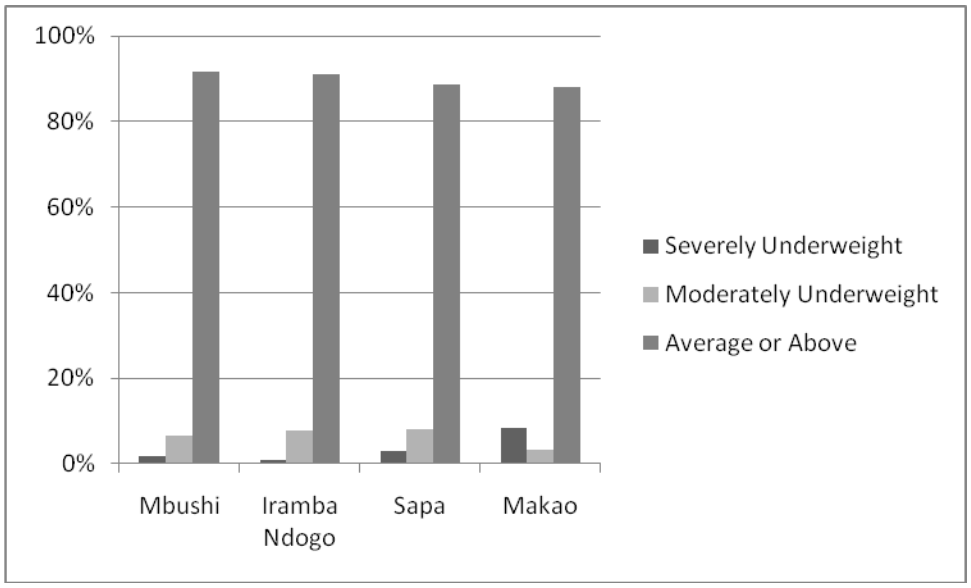
The majority of children under five have eaten ugali in the last 24 hours, ranging from 68% in Makao to 76% in Mbushi. Other carbohydrates and green vegetables were also commonly consumed by the under five age groups. Nearly 33% of young children were given milk in the last 24 hours in Mbushi, Iramba Ndogo and Makao compared to 17% in Sapa. Meat protein such as beef, chicken or goat was rarely provided as less than 10% of under five children in Iramba Ndogo, Sapa and Makao had consumed any in the last 24 hours. Approximately 19% in Mbushi were given beef in Mbushi. Other food types such as fruits were not common in under five children's diets as less than 5% received bananas, oranges, pineapple or any other fruit. Ugali, other carbohydrates and green vegetables were most likely to given to young children. Meat proteins and fruits were rarely provided, indicating a general lack of diversity in the surveyed villages in Meatu district.

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. Generally, the z-scores show that there are few underweight children in any of the villages (see Figure 16). Mbushi children are well off as there are no observations of any under fives below two standard deviations. There are a few cases of moderately underweight children in Makao (3%), Sapa (3%) and Iramba Ndogo (2%).

The height-for-age z-score reflects the level of growth stunting in a village compared to international averages. Similar to the weight-for-height z-score, below two standard deviations (-2

SD) is considered moderately stunted and below three standard deviations (-3 SD) is considered severely stunted. The z-scores in the four villages indicates that stunted growth is a significant issue for children under five years as 19% in Iramba Ndogo, 20% in Mbushi, 23% in Makao and 26% in Sapa are moderately stunted. Moreover, 10% in Mbushi, 11% in Iramba Ndogo, 12% in Sapa and 15% in Makao are considered to be severely stunted. Despite the z-scores, it is important to note that such figures are fairly consistent with the national average in Tanzania in which stunted growth has been a troubling issue for past decades.

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. On average, Mbushi faces the highest food insecurity with a village score of 4.35 compared to 3.47 in Makao, 3.43 in Sapa and 3.29 in Iramba Ndogo.

Consistent with this finding, one can see in Table 8 that more households in Mbushi worried about food in the last week while the Iramba Ndogo had the fewest that worried. However, the majority of households in all villages (between 78% to 87%) report eating limited foods in the past week.

Table 8. Percent of Households that Experienced a 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
Mbushi	65%	85%	15%
Iramba Ndogo	45%	80%	15%
Sapa	57%	87%	10%
Makao	55%	78%	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. Very few households surveyed currently grow and fewer have received any training for growing and maintaining a kitchen garden. 3% of households in Mbushi and iramba Ndogo grow kitchen gardens while no one grows one in Sapa and Makao.

4. 7 Agriculture

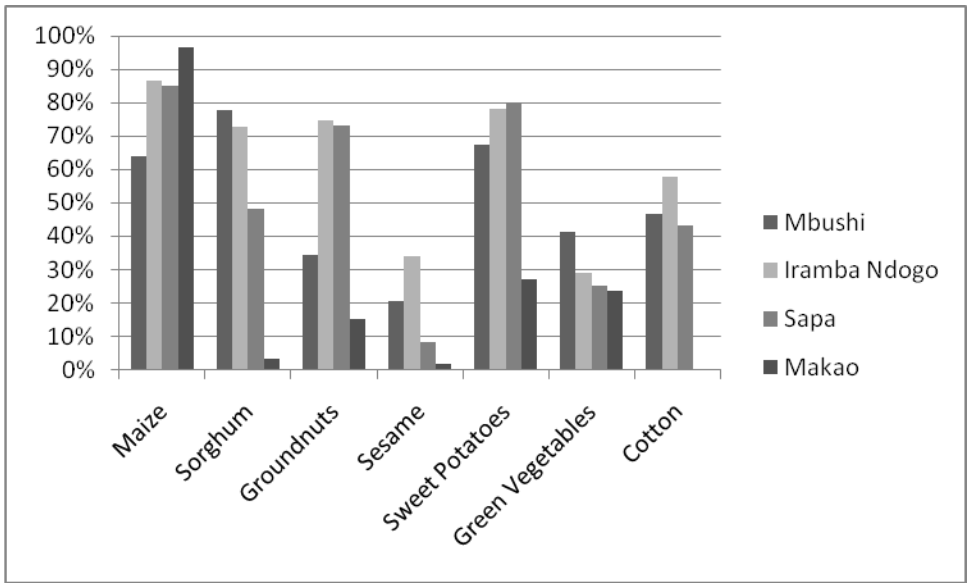
Subsistence farming and crop sales are listed as the most important livelihoods for all villages, further indicated by the fact that most household heads list farming as their primary occupation. The vast majority of households, from 73% in Sapa to 90% in Makao, own land at least some of the land that they work. On average, Mbushi residents have the most land available per household at 27.3 acres followed by 24.6 acres in Iramba Ndogo, 15.4 acres in Sapa and 7.2 acres in Makao. Despite the total acres per household that is available, less than half of that land is cultivated at 11.7 acres per household in Iramba Ndogo, 11.3 acres in Mbushi, 6.7 acres in Sapa and 3.3 acres in Makao. Participants in agricultural focus groups show that no farmers own land with a title.

Most households in Mbushi, Iramba Ndogo and Sapa grow a wide diversity of crops as between 83% to 95% grow at least 3 crops. Makao stands in contrast as only 48% grow 3 or more crops while 32% grow 2 crops and 18% grow 1 crop. Most types of crops grown vary by village. Maize is the most consistently grown and harvested crop among the four villages, ranging from 64% in Mbushi to 97% in Makao. Sorghum is frequently grown in Mbushi (78%) and Iramba Ndogo (73%) compared to Sapa (48%) and Makao (3%). While groundnuts are common to Iramba Ndogo (75%) and Sapa (73%), such is not the case in Mbushi (35%) and Makao (15%). Focus Group Discussions revealed that cotton is widely grown and sold in Mbushi, Iramba Ndogo and Sapa to Jambo and GAKI companies while those companies have no presence in Makao, which grows no cotton. Figure

17 displays the other most frequently grown crops among the villages. Qualitative data shows that maize, sorghum, sweet potatoes and cow peas are the most common subsistence crops.

90% to 100% of farmers in the four villages sell cash crops. While farmers in Iramba Ndogo, Sapa and Mbushi list Jambo and GAKI companies as their primary buyers, Makao farmers state that non-farming pastoralists from neighboring villages or local businessmen are their top customers. Many also sell crops at the nearest market in Iramba Ndogo and Sapa with a distance at 5 km and 10 km respectively. Farmers in Mbushi indicate that Jambo and GAKI companies purchase crops from their homes and transportation to a market is unnecessary. Among widely grown cash crops, prices are fairly consistent between the villages and the only variation in prices is for cotton which ranges from 600 TSH in Sapa to 800 TSH in Iramba Ndogo. The villages that do not mention selling crops at a market, Mbushi and Makao, keep higher proportions of their harvest compared to Iramba Ndogo and Sapa, which rely more on customers, from neighboring villages to cotton companies, buying directly from the farmer's household.

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 9.

Table 9. Qualitative Data on District Agricultural Environment

Village	% HH that Irrigate Plot	% HH using Fertilizer		% HH with Soil Erosion as Serious Problem
		Inorganic	Organic	
Mbushi	0%	NA	10%	80%
Iramba Ndogo	0%	0%	100%	50%
Sapa	0%	0%	8%	20%
Makao	0%	0%	0%	25%

Perceptions of the problem with soil erosion varies by village. Respondents from Sapa and Makao are not very concerned with a soil erosion problem while farmers from Iramba Ndogo are somewhat concerned and respondents from Mbushi are very concerned. Methods to address soil erosion include terracing, contour cultivation, using rocks or stones, constructing dykes, and planting trees. No village uses inorganic fertilizers and few use organic fertilizers except in Iramba Ndogo where all use fertilizers that are usually obtained from cow pens. Low fertilizer use in Makao and Mbushi is attributed to land being sufficiently fertile while respondents in Sapa state that there is a lack of access or knowledge of fertilizers.

4.8 Livestock

Households in Mbushi and Iramba Ndogo are more likely to own livestock such as cows, goats and chickens than in Sapa and Makao. While the percentage of households that own chickens is more widespread among the four villages, nearly half to three fourths in Mbushi, Iramba Ndogo and Sapa own cows or goats while approximately one fourth own either in Makao. Despite having the lowest percentage of households with livestock, Makao has among the highest average number of cows and goats per household, indicating that the few households with livestock have a considerable number. Table 10 shows the average number of livestock by household.

Table 10. Mean Number of Livestock Owned per Household by Village

	Cattle	Goats/sheep	Chickens
Mbushi	45.11	28.48	8.29
Iramba Ndogo	19.38	23.49	7.34
Sapa	11.77	18.85	5.66
Makao	41.46	34.35	7.66

In the agricultural focus groups, participants stated whether they vaccinated cows or goats and sheep against diseases. 100% of cows in Iramba Ndogo and 95% in Sapa have been vaccinated Rift

Valley Fever (RVF), Contagious Bovine Pleuro Pneumonia (CBPP), Anthrax or East Coast Fever (ECF). While 70% of cows in Mbushi were vaccinated for Anthrax, only 3% were vaccinated in Makao for CBPP. There were no vaccinations administered for goats or sheep in any of the villages. Cattle loss due to disease was fairly low; however, the two villages with the highest vaccination rates, Iramba Ndogo and Sapa, lost considerably more than did Makao with the lowest vaccination level. Loss of goats or sheep to disease is fairly low throughout the villages, ranging between 7% in Iramba Ndogo to 11% in Mbushi and Sapa. Loss of cattle or goats and sheep to drought, theft or wild animals was very low for the villages in Meatu district as all losses to those events accounted for less than 5% of the herd.

Newcastle Disease is the number one cause of chicken mortality in Tanzania; however, very few households vaccinated against this disease in Iramba Ndogo (4%), Mbushi (4%), Sapa (2%) and Makao (2%). Compared to other types of livestock, the percentage loss of the chicken herd is considerably higher among the villages, ranging from 16% in Makao to 29% in Sapa. Loss to wild animals was also relatively high as Makao lost 21% of its herd to wild animals, followed by 20% in Mbushi, 19% in Sapa and 14% in Iramba Ndogo.

5 CONCLUSIONS

5.1 Recommendations

The villages in Meatu district have many social and economic similarities and differences. As district and village leaders review these results, it would be helpful for them to consider how best to increase access to government services and align the priorities of wildlife organizations and companies with that of residents. 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. 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.
- Improving access to quality water has tremendous health and food implications for residents. While constructing new protected water sources is ideal, increasing the number

of households that take some measure to make water safer would boost public health outcomes in the short run.

- Build on existing momentum of HIV prevention awareness to decrease the number of men and women with low knowledge to 0.
- There are already high levels of livestock vaccination among cattle and goats or sheep. Such foundations can be used to launch initiatives for vaccinating chickens against Newcastle disease.

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 Iramba 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

		Mbushi	Iramba Ndogo	Sapa	Makao
THE HOUSEHOLD AND HOUSING					
	Number of households surveyed	60	60	60	60
	Average household size	8.78	8.65	7.10	5.48
	% households in polygamous marriage (more than 1 wife)	41.67%	23.33%	35.00%	16.67%
	% of households headed by women	18.64%	11.67%	15.00%	23.33%
	% of households with corrugated roof	10.00%	26.67%	21.67%	42.55%
	% of households using a toilet	26.67%	60.00%	40.00%	55.02%
	Avg time (minutes) required to collect water	134.24	93.45	119.75	42.41
	% households use firewood as primary energy source for cooking	98.33%	96.67%	0.00%	8.33%
EDUCATION					
	% of all adults without education	27.23	29.54	33.17	35.84
	% of household heads completed primary school	40%	43%	48%	42%
	% of adult men completed primary school	61%	66%	54%	50%
	% of adult women completed primary school	56%	48%	50%	41%
	Average primary school teacher to student ratio	1:87	1:103	1:97	1:91
	Average primary school textbook to student ratio	1:3	1:3	1:3	1:4
	Average secondary school teacher to student ratio	NA	NA	NA	NA
	Average # of years teachers stay at primary school	2	5	5	5
	Average # of years teachers stay at secondary school	NA	NA	NA	NA
	Ratio of female to male gross enrollment rates (primary school)	1:1.1	1:1.01	1:0.83	1:1.03
	Ratio of female to male gross enrollment rates (secondary school)	NA	NA	NA	NA
HEALTH					
	% of households with at least one mosquito net	86.67%	83.33%	76.67%	68.33%
	% of households with access to protected drinking water	0.00%	5.00%	13.33%	71.67%
	% of households that take measures to make the water safe	26.67%	30.00%	40.00%	46.67%
	# of hospital/dispensary/clinic in the village	1	1	0	1
CHILDREN UNDER 5					
	% of infants exclusively breast fed through 6 months of age	10.58%	14.71%	11.46%	17.65%
	Average age in months at introduction of complementary feeding	5.52	4.79	4.88	5.49
	% of children whose birth mother is still alive and inside the hh	95.5%	93.27%	98%	91.94%
	% of children moderately to severely underweight	7.69%	2.00%	4.26%	4.35%
	% of children who are vaccinated for BCG	88.29%	87.5%	84.00%	85.48%
	% of children who are vaccinated for polio	89.19%	88.46%	83.00%	83.87%
	% of children who are vaccinated for DPT	89.19%	86.54%	81.00%	83.87%
	% of children who are vaccinated for measles	62.16%	62.50%	34.00%	59.68%
	% of children received Vitamin A supplement	45.95%	46.15%	25.00%	45.16%
	% children with fever	59.46%	69.23%	60.00%	38.71%
AIDS KNOWLEDGE					
	% of men with high AIDS knowledge score (5-6 points)	67%	55%	68%	65%
	% of women with high AIDS knowledge score (5-6 points)	69%	64%	70%	84%
	% of women who know that a person can protect themselves from HIV	94%	93%	96%	98%
	% of men who know that a person can protect themselves from HIV	88%	98%	98%	93%
	Perception of risk of mother-to-child transmission of HIV	90%	84%	85%	84%
	% of men who have talked with their wife/primary partner about ways to prevent HIV/AIDS	65%	74%	75%	74%
	% of women who have talked with their husband/primary partner about ways to prevent HIV/ AIDS	30%	40%	47%	47%
FOOD SECURITY AND NUTRITION					
	% of households worried about food in the past 4 weeks	65.00%	45.00%	56.67%	55.00%
	% of households ate limited variety of food in the past 4 weeks	85.00%	80.00%	86.67%	78.33%
	% of hhs went one day and night with no food in the past 4 weeks	15.00%	15.00%	10.00%	10.00%
	% of households that are currently growing kitchen garden	3.33%	3.33%	0.00%	0.00%

	Avg # of days/times hhs ate meat protein in past week	2.37	2.73	1.72	1.72
	Avg # of days/times hhs ate legumes in past week	1.49	3.9	3.15	1.32
	Avg # of days/times in last week hh ate foods with Vitamin A	0.63	0.94	0.67	0.56
	# of different types of food eaten in last week	4.20	5.62	5.07	4.47
	Food Security Index	4.35	3.29	3.44	3.47
ECONOMIC ACTIVITY, AGRICULTURE AND INCOME					
	% households own any agricultural land	85.00	80.00	73.33	90.00
	Average acres cultivated per household	11.32	11.68	6.74	3.27
	Average # of cattle owned per household	45.11	19.38	11.77	41.46
	Average # of goats/sheep owned per household	28.48	23.49	18.85	34.35
	Average # of chickens owned per household	8.29	7.34	6.18	5.66
	% of hhs whose chicken are vaccinated for Newcastle disease	3.57	3.77	1.82	1.79
	% of cattle lost to disease in the past 12 months	9%	8%	12%	3%
	% of cattle lost to drought in the past 12 months	2%	2%	3%	1%
	% of cattle lost to wildlife in the past 12 months	1%	0%	0%%	0%
	% of chickens lost to disease in the past 12 months	24%	21%	29%	16%
	% of chickens lost to drought in the past 12 months	0%	0%	0%	0%
	% of chickens lost to wildlife in the past 12 months	20%	14%	19%	21%
	% of goats/sheep lost to disease in the past 12 months	11%	7%	11%	9%
	% of goats/sheep lost to drought in the past 12 months	3%	3%	1%	0%%
	% of goats/sheep lost to wildlife in the past 12 months	3%	3%	4%	4%
	% of household heads with the main occupation of farming	91.53%	96.67%	95.00%	80.00%
	% of hh heads with the main occupation of livestock keeping	5.08%	0.00%	0.00%	8.33%
	% HHs that report loss of crops due to wildlife	37%	21%	34%	32%
	% of HHs that irrigate the plots in village (from focus group data)	0%	0%	0%	0%
	% households with bicycle	68.33%	80.00%	76.67%	40.00%
	% households with radio	31.67%	36.67%	46.67%	33.33%
	% households with cell phone	40.00%	43.33%	33.33%	43.33%
KEY INSTITUTIONS					
	Distance to major weekly market	NA	5 km	10 km	NA
	# of village committees/groups	3	0	2	0
	# of NGOs	4	7	4	7
	# of credit, banking services or VICOBA	0	1	1	0
DEMOGRAPHICS					
	Religion (% Christian; % Muslim; % Traditional)	20%	22%	20%	55%
	Dependency Ratio (# of child (0-14 years) and aged (65+) population per 100 intermediate age (15-64 years)	133.48	138.71	124.21	112.26
	Child-Woman Ratio (# of children aged 0-4 years per 1,000 women in the age group 15-44 years)	0.61	0.55	0.63	0.49
	Sex Ratio (# of males per 100 females)	1.03	0.99	1.06	0.88