

UNIVERSITY OF MINNESOTA



The Whole Village Project

Village Reports for Engaruka, Migombani, Naitolia,
and Selela in Monduli District

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TABLE OF CONTENTS

Acknowledgements	1
Table of Contents	3
Acronyms	6
1 Introduction	7
2 Methodology	7
3 Key Findings	9
3.1 District Strengths	9
3.2 District Gaps	9
3.3 Opportunities	10
4 Results and Discussion	1
4.1 Household Livelihood and Assets	12
Figure 1. Main Occupation of Household Head.....	12
Table 1. Village Recommended Activities to Improve Local Livelihoods	13
4.2 Civic Engagement	13
Table 2. Civic Participation by Village by Percentage of Respondents	14
4.3 Village Institutions	14
Table 3. Institutional Resources by Village.....	14
4.4 Education	17
4.4.1 Household-Head Education	17
4.4.2 Primary School Completion.....	17
Figure 2. Percent Adults with No Education versus Completed Primary School	17
Figure 3. Adult Primary School Completion Rates, Disaggregated by Sex.....	18
4.4.3 Access to Primary Education	18
Table 4. Primary School Environment.....	18
Table 5. Percent of Students Attending Primary School Hungry	19
4.5 Health	19
4.5.1 Access to Health Services.....	19
Table 6. Problems with Health and Health Care, Problem Ranking by Village	20

4.5.2	Malaria and Other Illnesses	21
	Figure 4. Households with Mosquito Nets, Treated and Untreated	21
4.5.3	Under-Five Health Status.....	22
	Figure 5. Primary Caretaker of Children Under-Five	22
	Figure 6. Percent Children Under-5 Who Have Ever Had a Disease	23
	Figure 7. Percent Children Under-5 Vaccinated	24
4.5.4	Environmental Health	24
	Figure 8. Type of Toilet Used by Most Household Members	24
	Figure 9. Primary Sources of Drinking Water	25
	Table 7. Average Time to Collect Water	25
4.5.5	HIV/AIDS.....	26
	Figure 10. Village HIV/AIDS Knowledge Scores, Disaggregated by Sex.....	27
	Figure 11. Percent Eligible Adults with No versus High HIV Prevention Knowledge	28
	Figure 12. Eligible Adults with No HIV Prevention Knowledge, Disaggregated by Sex.....	28
4.6	Nutrition and Food Security	29
4.6.1	Household Nutrition.....	29
	Figure 13. Households Eating Grains & Green Vegetables All (or More) of Last 7 Days	29
4.6.2	Infant and Young Child Feeding	29
	Figure 14. Total Percent Children Exclusively Breastfed for IYCF Recommended Time	30
4.6.3	Under-Five Nutrition.....	30
	Figure 15. Percent Children Under-5 Eating Food Item in Last 24 Hours.....	31
	Figure 16. Percent Children Under-5 Malnourished.....	32
4.6.4	Food Security	32
	Table 8. Percent of Households that Experienced a Food Insecurity in Last 4 Weeks.....	32
4.6.5	Kitchen Gardens.....	33
4.7	Agriculture	33
	Figure 17. Percent Households Cultivating by Number of Crops Cultivated.....	34
	Table 9. Qualitative Data on District Agricultural Environment.....	34
4.8	Livestock.....	35
	Figure 18. Cattle Owned, Lost to Disease and Drought.....	36
4.9	Human-Wildlife Conflict.....	37
5	Conclusions	37
5.1	Recommendations	37

5.2	Next Steps	38
5.3	How You Can Help	39
	Appendix A – Survey Instruments.....	40
	Appendix B – Table of Selected Indicators by Village.....	41

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. Village-level surveys were conducted in Monduli District in Engaruka, Migombani, Naitolia, and Selela from October to December, 2009.

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 65-70 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) an 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 about myriad aspects of four villages in Monduli District. 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

Cow and goat vaccination rates among livestock owners are high in the district. Given that income from livestock sales is the main source of income for a majority of households surveyed, such high vaccination rates contribute to the stability and reliability of household livelihoods.

Civic engagement, specifically as measured through participation in village assemblies, is relatively high with almost 60% of household survey respondents from three of four villages participating in a village assembly in the last 12 months. Villages provide regular opportunities for community members to attend these assemblies with each village survey facilitating at least one village assembly every two months and one village (Naitolia) holding one almost every month.

Children under five are more likely to survive and be healthy if the biological mother is alive. In Monduli District, the biological mother is alive in almost every household surveyed. Furthermore, either both parents or the mother alone are the primary caretakers of the children indicating a strong family structure, which further contributes to the long-term health and well-being of children under five. This also implies that there are relatively few orphans and vulnerable children living in the villages assessed as most children are cared for by one or both of their biological parents.

3.2 District Gaps

Access to a quality primary school education is low in Monduli District. District primary schools tend to suffer from poor teacher-to-student and classroom-to-student ratios creating a learning environment in which too many students are crammed into too few classrooms and taught by too few teachers. Limited access and poor quality is reflected in low adult primary school completion rates.

Access to quality health services is also limited in the district. According to men, women, and village leaders assessed issues related to health and health care rank among the top three problems facing their villages. This high ranking stems from the long distances many people have to travel to access services (only two of the four villages assessed have a government dispensary) and the quality of those services once they are reached. In general, male and female respondents feel that the treatment they receive from health facilities for themselves and their children is of low quality.

Malaria is the most prevalent disease affecting households, especially children under five. Even though malaria is rightly considered by men, women, and health officers to be the leading cause of disease in all villages and over 90% of children under five have suffered from fever in Engaruka, Naitolia and Selela, less than one-third of households in these three villages own an insecticide-treated mosquito net to prevent malaria. In Migombani, where two-thirds of households own at least one insecticide-treated mosquito net, the incidence of fever among children under five is still too high at over 80%.

Any level of acute malnourishment among children under five must be considered a gap. Nearly 1 in 10 children under five in Engaruka are acutely malnourished, and almost 1 in 20 children in Engaruka and Selela are severely malnourished. Similarly, in all villages surveyed (except Migombani) over half of households had experienced some level of food insecurity, such as eating fewer meals, no food in the house, or going to bed hungry, in the last four weeks.

Newcastle Disease is the number one cause of chicken mortality in Tanzania. Vaccination rates against Newcastle Disease are low in Monduli District. The highest vaccination rate (40% in Migombani) is still relatively low given the severe consequences of infection with Newcastle Disease.

3.3 Opportunities

Although agriculture is the main occupation among households surveyed in Monduli District, income from farming is only significant for households in one village (Migombani). The most common source of income for households in Engaruka, Naitolia, and Selela is livestock sales. This disconnection between main occupation and main income source may be connected to the nature of the farming –small-scale, subsistence agriculture – typically done in the district. In order to increase household income, district leaders have an opportunity to design strategies for matching

the primary occupation with primary income source either by expanding opportunities for sale of agricultural produce or scaling up of pastoralism.

In addition to expanding income opportunities related to agriculture and pastoralism, the District also has an opportunity to increase the quality of farming and livestock in the district. Only two of the four villages surveyed – Migombani and Selela – had been visited by an agricultural extension worker in the past year. Farmers participating in programs led by these agricultural extension workers learned best practices in farming techniques that they could apply to their personal farms. Expanding opportunities for farmers to access quality training such as this would increase the farmers' abilities to produce higher quality crops in higher yield. Similarly, veterinary services are limited – only one village (Migombani) has a local veterinarian and community animal health workers are limited. Increasing animal health services to livestock owners through veterinarians and trained community animal health workers would also increase the reliability of those livestock in producing income for a household.

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 Monduli 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.

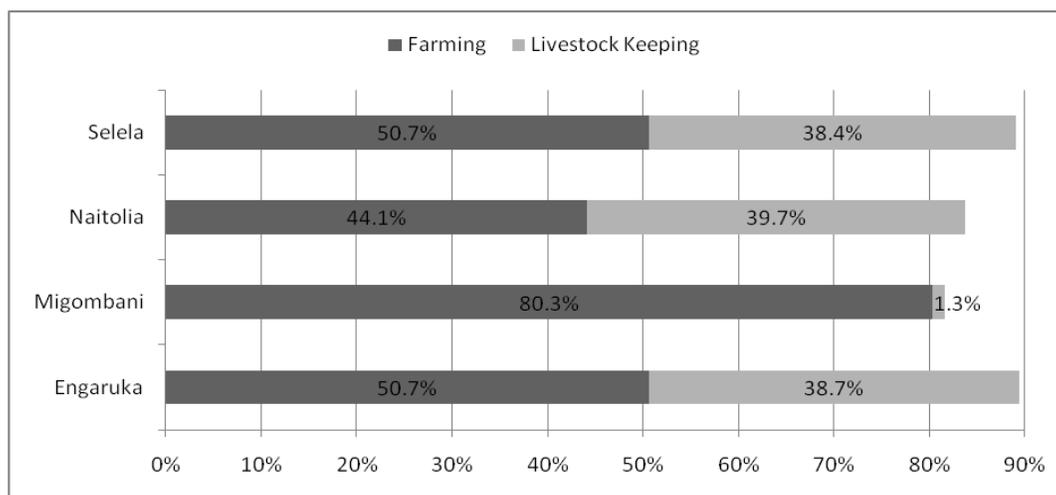
An additional opportunity for protecting children under five, as well as the adult population, from communicable disease exists in the gap between personal hygiene, a fundamental prevention strategy, and the low use of any kind of toilet among households surveyed. The District has an opportunity to educate the community on personal hygiene, proper human waste disposal, and how to construct a simple pit latrine. There may also be an opportunity to provide basic construction materials, if the reason for low toilet use is lack of resources to construct a simple pit latrine.

4 RESULTS AND DISCUSSION

4.1 Household Livelihood and Assets

Greater than 80% of household heads surveyed in Monduli District report either farming or livestock keeping as their main occupation (see Figure 1). A greater percentage of household heads farm than keep livestock however, pastoralists make up a large proportion of the population with the exception of Migombani.

Figure 1. Main Occupation of Household Head



More households are headed by a man than a woman in all villages surveyed. The largest percentage of female headed households is in Naitolia where 34% of households surveyed are headed by a woman. Female-headed households represent one-quarter to one-third of households surveyed in the other three villages.

Income from livestock sales is the most common source of income for households in Engaruka, Naitolia, and Selela; this income source is most significant in Naitolia where 65-70% of households earned any income from livestock sales and to 25% earned over Tsh 500,000 in the last 12 months. Over 75% of households in Migombani earn income from farming; almost one-quarter of Migombani households earned over Tsh 500,000 from farming in the last 12 months. Neither the sale of livestock products or natural resources nor remittances is a primary or significant source of income for households in any village surveyed.

The impact of unemployment was explored qualitatively in each village assessed. According to men responding, unemployment negatively impacts individual families and the community at-large.

Unemployment can lead to alcoholism, substance drug abuse, and sexual violence. In addition, families whose members are unemployed struggle to pay school fees, buy food, and pay for needed health care. At the community level, increased unemployment increases robbery, other crime, and poverty.

Focus group discussion (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	Male	Female	Village Leader
Engaruka	Microfinance	Microfinance	Livestock
Migombani	Microfinance	Microfinance	Subsistence farming
Naitolia	Beekeeping	Dairy cow and goat-rearing	Subsistence farming
Selela	Beekeeping	Microfinance	Subsistence farming

Asset ownership is a proxy indicator of a household’s socioeconomic status. When households were asked about ownership of durable goods such as cell phones, radios or bicycles, the most common item owned was a radio. However, the likelihood of owning a radio is still relatively low: only one-third to one-half of households in Engaruka, Naitolia, and Selela own a radio, and just over half of households in Migombani do. Among the four villages, Migombani households are most likely to own one bicycle (40.8%) or one mobile phone (32.9%), whereas Engaruka households are least likely to own either (9.3% have a bicycle, 8.0% have a mobile phone).

A majority of houses surveyed in Monduli District were built with natural materials, such as mud walls, earth/clay floors, and grass or palm thatch roofing. Migombani has a greater percentage of households with cement block walls (26.3%) and corrugated iron sheeting roofs (64.5%) than any other village surveyed in Monduli District. Cement block walls are very uncommon in the other four villages: no household surveyed in Engaruka was constructed with cement block walls, and only 1-6% of households in Naitolia and Selela were. From 11% (Naitolia) to 27% (Selela) of households in these four villages have corrugated iron sheeting roofs.

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 5 respondents in Naitolia 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 Engaruka where less than half of respondents participated in a village assembly meeting in the last 12 months. As expected, civic participation among household survey respondents in all villages is highest in the activity that requires the least personal investment: participation in village assemblies (see Table 2).

Table 2. Civic Participation by Village by Percentage of Respondents

	Engaruka	Migombani	Naitolia	Selela
Village government or committee member	14.7%	15.6%	19.4%	12.2%
Participated in village assembly (last 12 mo)	42.7%	64.9%	58.3%	63.5%
Asked village leader for assistance (last 12 mo)	10.7%	16.9%	13.9%	20.3%

Opportunities for civic participation at village level were assessed by number and type of village assemblies held in the past 12 months. Although it is the only village without a farmer's cooperative, Naitolia convened the greatest number of village assemblies in the last 12 months: ten. Both Engaruka and Selela held six village assemblies; Migombani held nine.

4.3 Village Institutions

Table 3 presents a picture of the institutional analysis conducted in each village surveyed in Monduli District. These village assets are categorized as village-run, a village committee or group, or operated by a third party. The "sector" column indicates the primary project areas in which the institution operates.

Table 3. Institutional Resources by Village

Institution	Engaruka	Migombani	Naitolia	Selela	Sector
Village-Run					
Education	x	x	x	x	education
Health Service	x	x		x	health
Religious Institution (church, mosque, etc)	x	x	x	x	Faith-based
Veterinary Services		x			Animal health
Village Council /Government	x	x	x	x	politics/government
Village Market	x			x	business development
Sub-total village-run	5	5	3	5	
Village Committee / Group					
Environment/Natural Resources Cmte		x	x	x	environment, farming/agriculture

Institution	Engaruka	Migombani	Naitolia	Selela	Sector
Education Committee	x	x	x		education
Water Committee	x	x	x	x	water/farming/agriculture
Ag & Livestock Committee	x	x	x		farming/agriculture
Elder's Committee	x	x	x		health, human development, social welfare
Women's Committee		x			education, financial/socioeconomic, health, human development
Land Committee		x	x	x	environment, farming/agriculture, financial/socioeconomic, legal/law enforcement, politics/government,
Hazards/Disaster Committee	x	x	x	x	aid/development, social welfare
Farmers Coop/Ag Assn	x	x		x	farming/agriculture
Security Committee			x		legal/law enforcement, social welfare
Community Development/ Planning/ Financial Committee			x		business development, financial/socioeconomic, politics/government, social welfare
Health, HIV/AIDS Committee	x				health, HIV/AIDS
SFTZ			x		research, HIV/AIDS, wildlife/conservation
Social Services/ Social Welfare Committee				x	social welfare
Sub-total village committee/group	7	9	10	6	
Third-Party Operated					
Campground			x		
Hunting/ Photographic/ Safari/ Tourism		x		x	business development, environment, wildlife/conservation
National Park		x			Wildlife/conservation
AAIDRO					aid/development
ADDO	x	x		x	aid/development, social welfare
ARK			x		health, HIV/AIDS, social welfare
AWF			x		wildlife/conservation
Born Free					Wildlife/conservation
CBO					aid/development
CORDS	x		x		aid/development
DIACONICAL		x			Social welfare
Haki Kazi Catalyst		x			Civil society, social welfare
Heifer Project					farming/agriculture
ICA	x	x		x	human development

Institution	Engaruka	Migombani	Naitolia	Selela	Sector
IDRO				x	
LOOCIP			x		
MALI HAI CLUB			x		
MVIWATA	x			x	
MWEDO	x			x	aid/development
NYWATEMA			x		
OLPOPONG					
PADEP		x			farming/agriculture
Pathfinder Int'l		x			Health
SACCOS	x	x		x	financial/socioeconomic
TANAPA		x	x		wildlife/conservation
TASAF				x	social welfare
TATEDO	x			x	energy/environment
Tanzania Travel Company					
TTCL		x			telecommunications/technology
VICOBA	x	x		x	financial/socioeconomic
World Food Program	x				food/hunger
World Vision			x		social welfare
Sub-total third-party	9	12	9	10	
TOTAL Institutions	21	26	22	21	

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. All four villages have at least 20 total institutions providing a range of services, but Migombani has the greatest activity level with 4-5 (approximately 20-25%) more institutions active in this village compared to the other three. Naitolia has the fewest village-run institutions (3), Selela has the fewest village committees/groups (6), and Engaruka and Naitolia have the fewest third-party institutions (9).

The benefits of high activity among institutions and the presence of many institutions may be reflected at village level. For example, among the four villages surveyed, Migombani tends to measure higher on favorable indicators (such as adult primary school completion rates) and lower on unfavorable indicators (such as under-five malnutrition).

4.4 Education

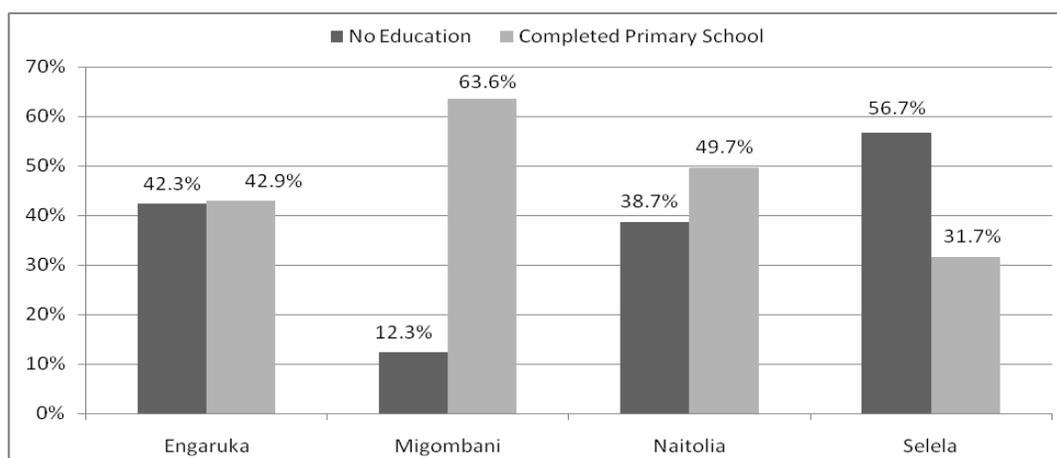
4.4.1 Household-Head Education

One-half to almost two-thirds of household heads surveyed in Engaruka, Naitolia, and Selela have had no formal education. This is in contrast to Migombani where over 85% of heads of household have had at least some schooling. Primary school completion rates among household heads range from 27.0% (Selela) to 66.2% (Migombani). No head of household surveyed has completed secondary school. When disaggregated by sex, primary school completion by household head is lower for female heads of household than male, except in Migombani where 80.0% of female household heads have completed primary school versus 62.5% of male household heads. At 14.3% Selela has the lowest percentage of female household heads who have completed primary school.

4.4.2 Primary School Completion

Figure 2 presents data on primary school completion among adults (age 15 and over) in households surveyed in Monduli District.

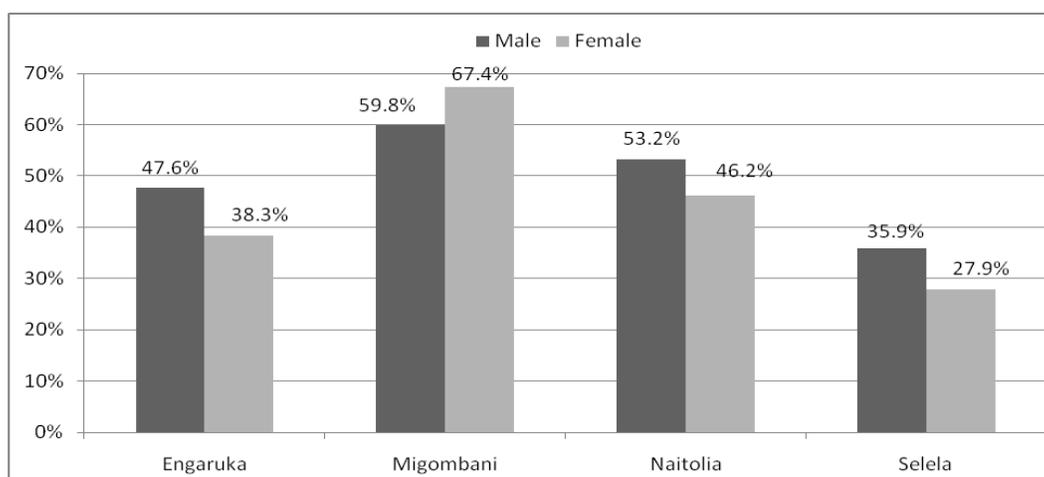
Figure 2. Percent Adults with No Education versus Completed Primary School



Between one-third and over half of the adults in Engaruka, Naitolia, and Selela have had no education; primary school completion rates are relatively low in each of these three villages (30-50%). Primary school completion rates are higher in Migombani, yet only two-thirds of adults in have completed primary school.

As shown in Figure 3, primary school completion is less likely among females than males, except in Migombani. Migombani has the highest primary school completion rates by both males and females (and Selela the lowest) among all villages surveyed in Monduli District.

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



Naitolia has the highest percentage of adults with at least some secondary education, but this is still low at only 1 in 6 adults. Naitolia is the only village with any adult surveyed (2) having completed secondary school.

4.4.3 Access to Primary Education

Each village surveyed in Monduli District has at least one primary school; Migombani has two primary schools. (Only Migombani and Selela have a secondary school in the village.) 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 4 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
Engaruka	895	1 : 64	1 : 111	0 : 1	100%
Migombani					
Migombani P.S.	293	1 : 58	1 : 36	1 : 4	88%
Mto wa mbu P.S.	1307	1 : 46	1 : 72	1 : 3	
Naitolia	446	1 : 49	1 : 63	1 : 2	100%
Selela	804	1 : 100	1 : 89	1 : 2	87.5%

Shortage of classrooms and teachers 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 4, in general, the primary schools in Monduli District have poor teacher-to-student, classroom-to-student, and textbook-to-student ratios.

Another measure of access is regular school attendance. Girls are much less likely than boys to regularly attend school in Engaruka and Selela; girls in Naitolia are about equally as likely as boys to regularly attend. Data on attendance disaggregated by sex are not available for the Migombani primary schools. The factors negatively affecting regular attendance by female students were not investigated either quantitatively or qualitatively.

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. Five of the six primary schools surveyed in Monduli District have a majority of students coming to school hungry (see Table 5). Of these five schools, only two provide any sort of food to students that could offset this hunger.

Table 5. Percent of Students Attending Primary School Hungry

Village	% Students Attending School Without Eating Food or Having Tea Only	School Meals Provided
Engaruka	100%	Porridge
Migombani		
Migombani P.S.	35%	Porridge
Mto wa mbu P.S.	80%	Lunch
Naitolia	70%	None
Selela	60%	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 to reach 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 Monduli District was collected through focus group discussions with men and women, as well as questionnaires completed by village leaders. In each village assessed, respondents ranked “problems with health and health care” in the top three problems facing the village (see Table 6). The lower the ranking, the greater the problem

is considered by the respondents (i.e. a problem ranked “1” is a greater concern than one ranked “3”).

Table 6. Problems with Health and Health Care, Problem Ranking by Village

Village	Problem Ranking by Respondent Type			Average Rank
	Men	Women	Village Leader	
Engaruka	2	3	3	2.7
Migombani	2	1	3	2.0
Naitolia	2	2	3	2.3
Selela	1	-	3	2.0

As presented in Table 6, the average respondent ranking (see last column “average rank”) places health and health care as the second to third most pressing problem in all five villages assessed in Monduli District. Notably, women in Migombani and men in Selela each consider health and health care as the top concern in their villages.

Only two of the four villages (Engaruka and Selela) have a government dispensary. Each dispensary is staffed by two nurses and one medical officer, each dispensary has a refrigerator, and all report providing maternal and child health services every day of the year except weekends and holidays.

Household surveys indicate that households most commonly seek treatment for ill children under-five from an established health facility: from almost 50% to 80% of households surveyed in Engaruka, Naitolia, and Selela take their children to a dispensary when sick, whereas over 75% of households in Migombani take children to a hospital for treatment. It is possible to assume these quantitative trends reflect the treatment-seeking behavior among adults. Although such quantitative data for adults are not currently available, qualitative data collected through focus group discussions (FGDs) with men and women indicate that adults tend to also seek treatment from a health facility (health clinic or hospital), rather than from a traditional healer or not seeking any treatment at all.

Although treatment is typically sought from a health facility, FGD participants did not rate the quality of services available from a health facility favorably. In general, these men and women felt that treatment received from health clinics was only “somewhat helpful.” Only participants in Engaruka felt any treatment received was “very helpful.” Participants across all villages identified

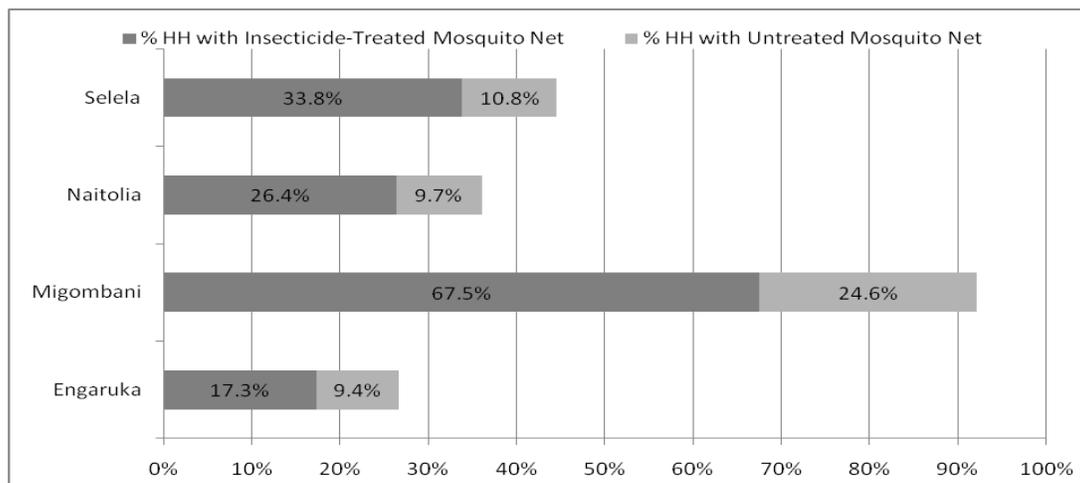
numerous ailments, such as ringworm, diarrhea, pneumonia, antenatal issues, male impotence, and coronary heart disease, for which treatment is considered “not helpful at all.”

The household surveys did collect information on traditional medicinal use, which allowed for a tabulation of frequency of traditional medicinal plant use by anyone in the household over the last 12 months. Higher rates of traditional medicinal use could indicate one of two issues: 1) low awareness about the benefits of seeking treatment from an established health provider, or 2) obstacles (e.g. no local dispensary) that prevent a client from accessing services from a health facility. Seventy-two percent (72%) of people surveyed in Engaruka had used a traditional medicinal plant “often” or “very often” in the past 12 months, which was the highest percentage among the four villages. At the other end of the spectrum, 70.1% of households surveyed in Migombani had never used a traditional medicinal plant in the past 12 months. The high use of traditional medicinal plants tabulated quantitatively contrasts with qualitative data collected through the FGDs, which indicate that only men in Selela seek treatment from traditional healers and only for certain conditions, namely for back pain, impotence, and urinary tract infections. (Of note, treatment received from traditional healers was the only treatment considered “not helpful at all” by the Selela FGD participants.)

4.5.2 Malaria and Other Illnesses

Figure 4 presents data by village on percentage of households owning a mosquito net that has ever been treated with an insecticide and percentage of households owning an untreated mosquito net.

Figure 4. Households with Mosquito Nets, Treated and Untreated



Household mosquito net coverage is not universal in Monduli District with ownership of any mosquito net being lowest in Engaruka (see Figure 4). As expected, in each village surveyed,

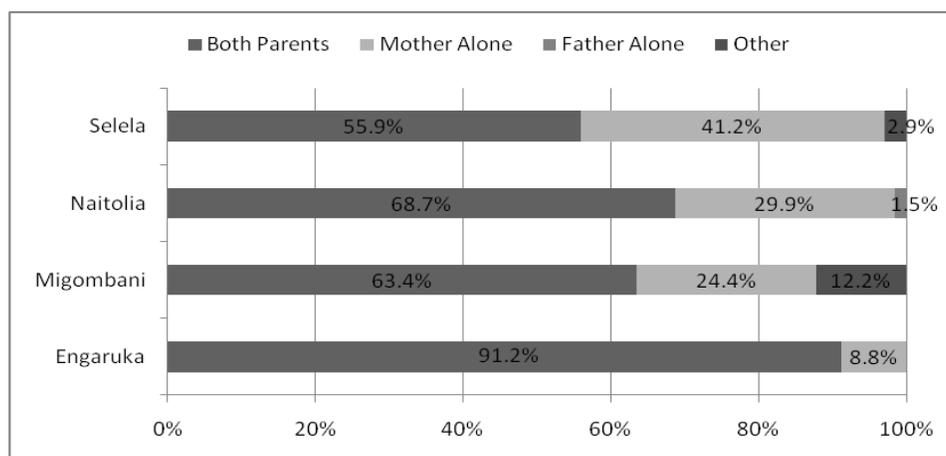
coverage with insecticide-treated mosquito nets is lower than total coverage with any mosquito net (untreated + insecticide-treated). However, as demonstrated by Figure 4, the proportion of insecticide-treated nets is greater than that of untreated nets of total nets owned in all villages.

Data on disease, illness, and death were only collected from the Selela dispensary; no record on the same could be found in the Engaruka dispensary. (Engaruka and Selela were the only villages surveyed with dispensaries.) Qualitatively, malaria was the most frequently identified health problem by participants in male and female focus group discussions (FGDs); malaria was identified on average 4.25 times per village FGD. Other health problems or diseases frequently mentioned included: pneumonia, obstetric/gynecological issues, diarrhea, and sexually transmitted diseases. The Health Officer in Selela noted malaria as the most pressing health concern in his village; four out of five deaths of children under five in the past 12 months in Selela were attributed to malaria.

4.5.3 Under-Five Health Status

The health status of children under five can be correlated to the presence or absence of biological parents, especially the biological mother. Almost 100% of mothers of children under five in households surveyed are still living; only two households surveyed had lost the natural mother. A much greater number of households (11) had lost the natural father, although the percentage of households with the father still alive remains high at 94-98%. Figure 5 indicates that childcare is mostly shared between the mother and father. It is very rare for the father to be the primary caretaker of the children; the father was the primary caretaker in only one household surveyed in Monduli District (in Naitolia).

Figure 5. Primary Caretaker of Children Under-Five

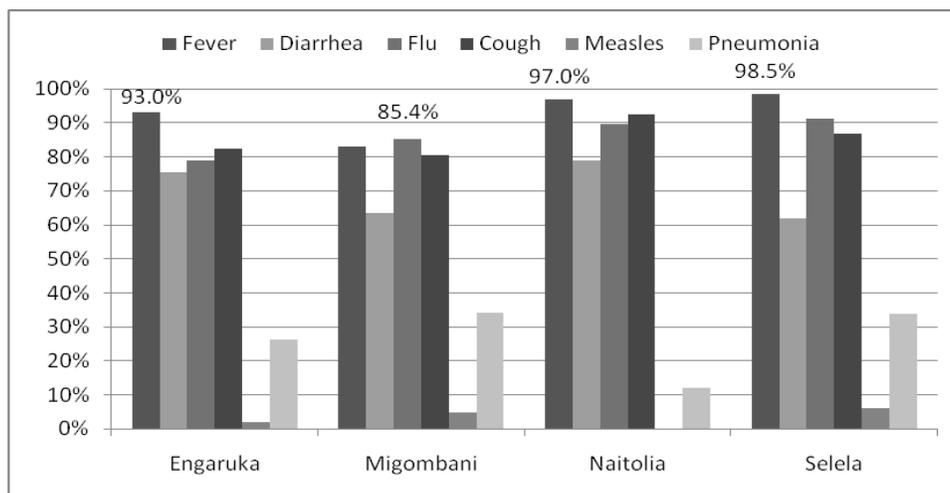


The data analysis did not connect data on loss of natural mother and loss of natural father, so determination of number of double orphans, if any, among households surveyed in the district is not possible. In households surveyed where the primary caretaker is someone other than the mother and/or father (in Migombani and Selela), the primary caretaker tends to be a grandparent.

In four out of the five villages surveyed, approximately one-quarter of children under five are considered frequently sick and 50-80% of children under five were sick sometime in the four weeks preceding the survey. In the five villages in the last two years, eight (8) households have lost a child under five years with the most deaths occurring in Selela (5 households).

Figure 6 gives a picture of the disease burden for children under five in Monduli District.

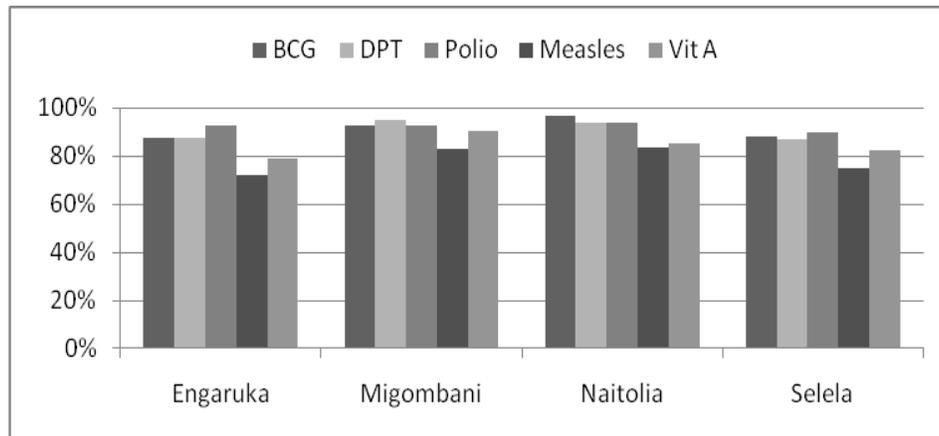
Figure 6. Percent Children Under-5 Who Have Ever Had a Disease



As shown in Figure 6, the most common cause of illness among children under five is fever, except in Migombani where a slightly greater percentage of children have suffered from flu than fever. (The most common cause of illness in each village is labeled with a percentage in Figure 6).

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 7 lists 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 7. Percent Children Under-5 Vaccinated

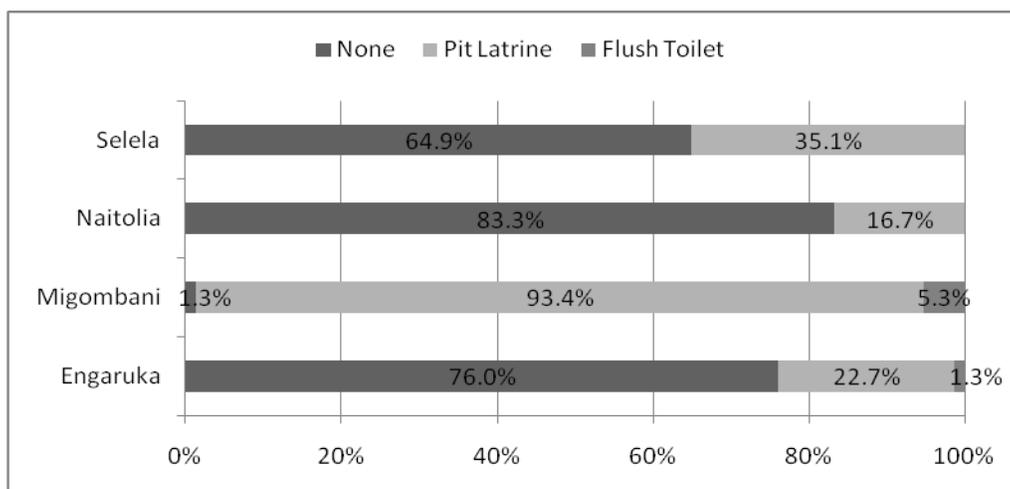


Migombani has the greatest percentage of children having received a DPT, BCG, or polio vaccine. Among all recommended vaccines, measles vaccination rates (72-84%) are the lowest within each village surveyed. The data shown in Figure 7 do not take into account age at vaccination or number of doses, so a determination of whether or not children are fully vaccinated is not possible.

4.5.4 Environmental Health

Many infectious diseases, especially diarrheal diseases, can be connected to poor hygiene and contaminated water and food sources. Three out of the four villages (Engaruka, Naitolia, and Selela) surveyed had a majority of households where most members of the household did not use any type of toilet (see Figure 8). By contrast, 93.4% of households in Migombani reported most members of the household used a pit latrine and only one household surveyed used no toilet at all.

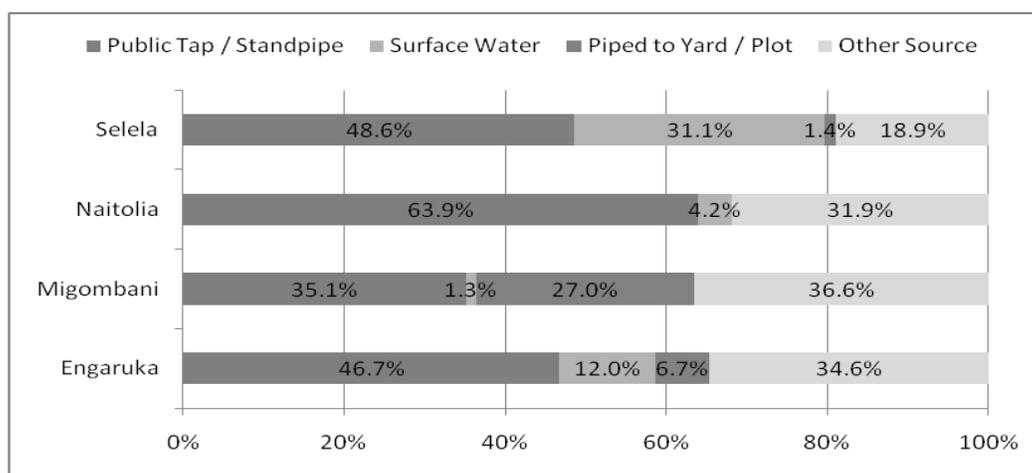
Figure 8. Type of Toilet Used by Most Household Members



Qualitative data indicate that the primary modes of refuse disposal in Monduli District villages are to bury refuse on a household compound, burn the refuse in the compound, or to throw it on the household farm.

Access to protected sources of clean drinking water is limited in Monduli District. As shown in Figure 9, the most common source of drinking water for households in all five villages is a public tap or standpipe. (Only those water sources that are common in at least one village surveyed are listed in Figure 9.) The “other” sources of drinking water are predominantly unprotected.

Figure 9. Primary Sources of Drinking Water



Even though the main water sources for a majority of households in Monduli District are unprotected, treatment of water prior to drinking is rare. The percent of households treating water is greatest in Migombani (36.4%); only 16-25% of households in the other villages treat water. Boiling is the most common method for making water potable among those households that do something to their water prior to drinking.

Table 7 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.

Table 7. Average Time to Collect Water

Village	Minutes to Collect
Engaruka	26.7
Migombani	5.7
Naitolia	97.8
Selela	93.9

In addition to significant time required to collect water, access to drinking water is further limited by long distances. Selela residents have the furthest distance to travel to access drinking water (almost 2 kilometers) and Naitolia residents have the longest time to travel (almost 100 minutes); Migombani residents have the shortest distance (less than ½ kilometer) and least time (less than 6 minutes) to access water.

Cooking fuel type and primary cooking location affect respiratory health, primarily of women and children. The majority of households in all villages cook with wood (92.2-100%) over an open fire (92.2-98.7%).

4.5.5 HIV/AIDS

The Whole Village Project team conducted Knowledge, Attitude and Practice (KAP) surveys on HIV/AIDS in Monduli District (Engaruka, Migombani, Naitolia, Selela) in October and November, 2009. 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. Therefore, a comment on the survey sample is necessary, specifically that the male sub-sample is unlikely to be representative of all adult males in the village surveyed. In aggregate, there is a wide divergence in response rates between eligible males and females. (Eligibility is 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. The non-representativeness of the male sub-sample should be kept in mind when interpreting sex differences.

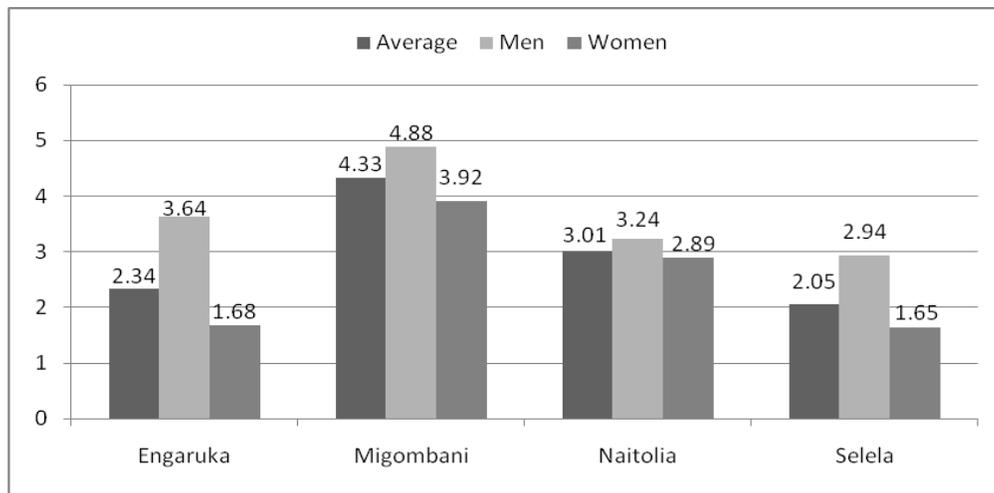
To assess an individual's correct knowledge of HIV/AIDS, the KAP survey asks six questions:

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 10.

Figure 10. Village HIV/AIDS Knowledge Scores, Disaggregated by Sex



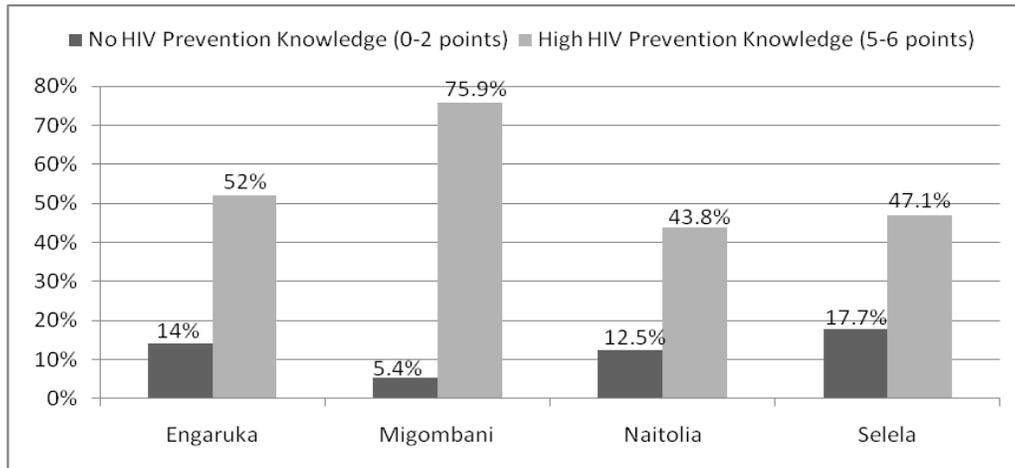
(A p-value less than 0.05 indicate a statistically significant difference between the averages of men's and women's scores. The differences between the averages of men's and women's scores are statistically significant in Engaruka, Migombani, and Selela each of which has a p-value less than 0.01.)

Migombani has the highest average HIV/AIDS knowledge score (average 4.33) as both its men (4.89) and women (3.92) scored the highest among villages surveyed (see Figure 10). The village with the lowest average knowledge score (2.05) was Selela whose men (2.94) and women (1.65) both scored the lowest of any village surveyed. In all villages surveyed, the women's average knowledge score is lower than the men's.

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

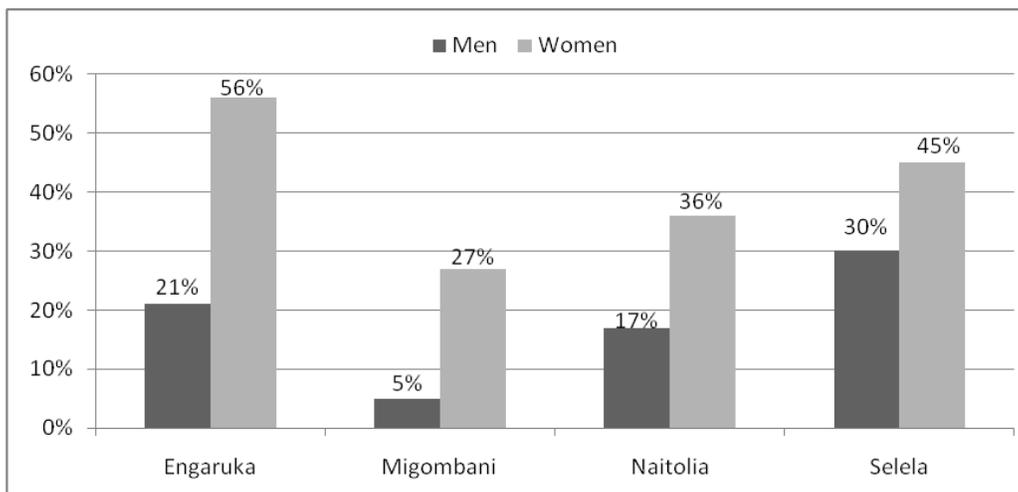
a score between 0 and 2 based on their answers to questions numbers 5 and 6. As shown in Figure 11, three-quarters of eligible adults in Migombani have high knowledge of HIV and its prevention. Only one other village surveyed (Engaruka) has at least half of eligible adults scoring 5-6 points on the HIV knowledge assessment.

Figure 11. Percent Eligible Adults with No versus High HIV Prevention Knowledge



As shown in Figure 12, in all villages surveyed, there are a greater percentage of women with no knowledge of HIV prevention methods as compared to the men in that village.

Figure 12. Eligible Adults with No HIV Prevention Knowledge, Disaggregated by Sex



There appears to be a tendency among women in some villages to deny knowledge about HIV/AIDS prevention, possibly because they do not feel comfortable discussing it. It is impossible to know how much of the sex differences reported in Figures 10 and 12 result from this phenomenon versus

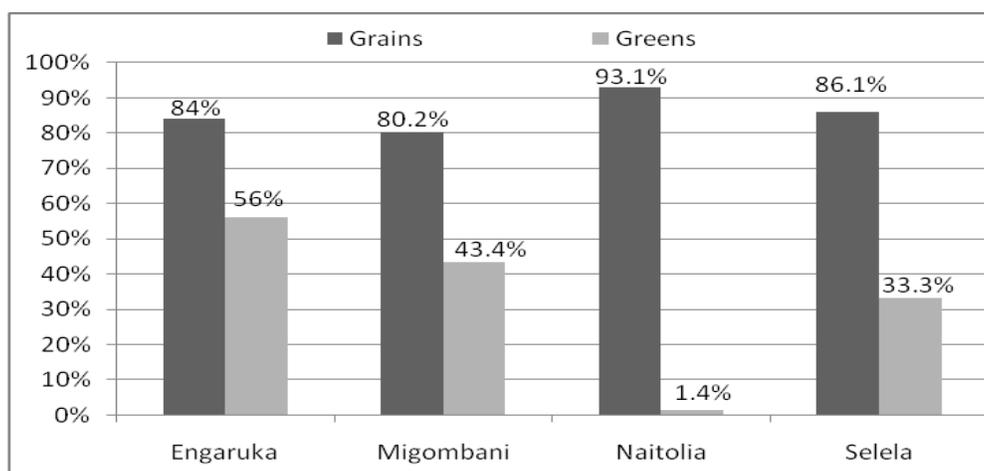
actual lack of knowledge. Since the questions about prevention strategies are skipped if the respondent says s/he does not know if there are any ways to prevent HIV infection, such denial would artificially lower the overall knowledge scores of women.

4.6 Nutrition and Food Security

4.6.1 Household Nutrition

Diversity of daily diets and consistent intake of recommended vitamins and nutrients is limited. A majority of households surveyed in all villages regularly eat grains (see Figure 13). Green vegetables are the most common secondary food to grains, except in Naitolia where it is unlikely for a household to eat green vegetables more often than three days in seven (only 1.4% of households in Naitolia eat green vegetables daily).

Figure 13. Households Eating Grains & Green Vegetables All (or More) of Last 7 Days



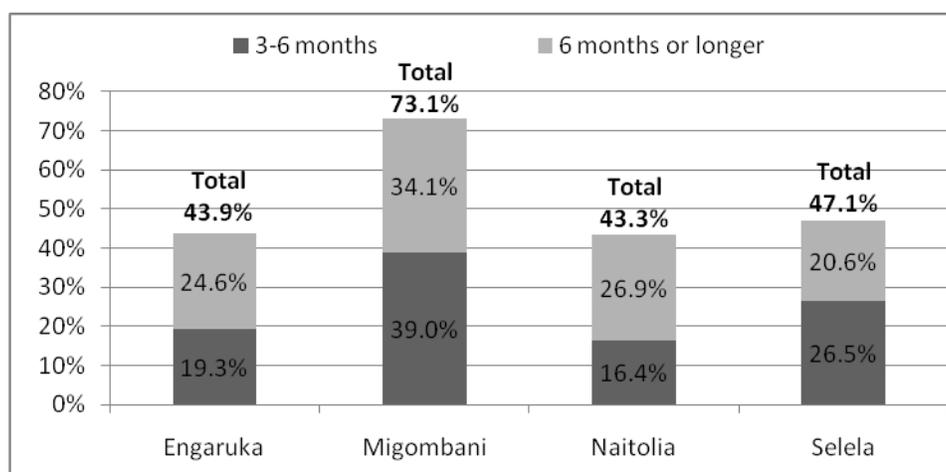
In general, households surveyed were least likely to have eaten root vegetables or dairy on any day in the last seven. Other rarely consumed foods include red vegetables (e.g. pumpkin, carrots, etc), mango and papaya, and fats. Protein is not consumed regularly, but when it is eaten it is more likely to be a meat or eggs than a legume.

4.6.2 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. Nearly 100% of children were breastfed (or still breastfeeding) in the villages surveyed, the only exception

being one child in Selela. In three villages – Engaruka, Migombani, Naitolia – 100% of the children breastfed were ever exclusively breastfed; in Selela, only 82.1% of children breastfed were ever exclusively breastfed. Figure 14 presents only data which are applicable to the IYCF practice of exclusive breastfeeding for the first six months. Although the data do not allow for a determination of the percentage of babies exclusively breastfed according to the recommendation, it does indicate the approximate percentage (refer to totals in Figure 14) of babies who are breastfed exclusively according to the IYCF guidelines. Less than half of children weaned at the time of the survey were exclusively breastfed for approximately 6 months in three of the villages surveyed, whereas over half and almost three-quarters of children were exclusively breastfed for the recommended 6 months in Migombani.

Figure 14. Total Percent Children Exclusively Breastfed for IYCF Recommended Time

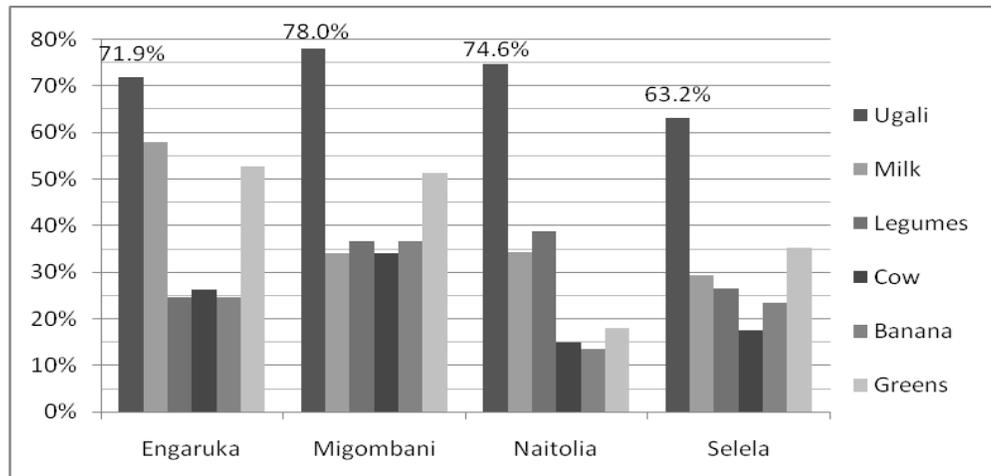


Among children that had been weaned at the time of the survey, the most common age of weaning was 24-35 months.

4.6.3 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



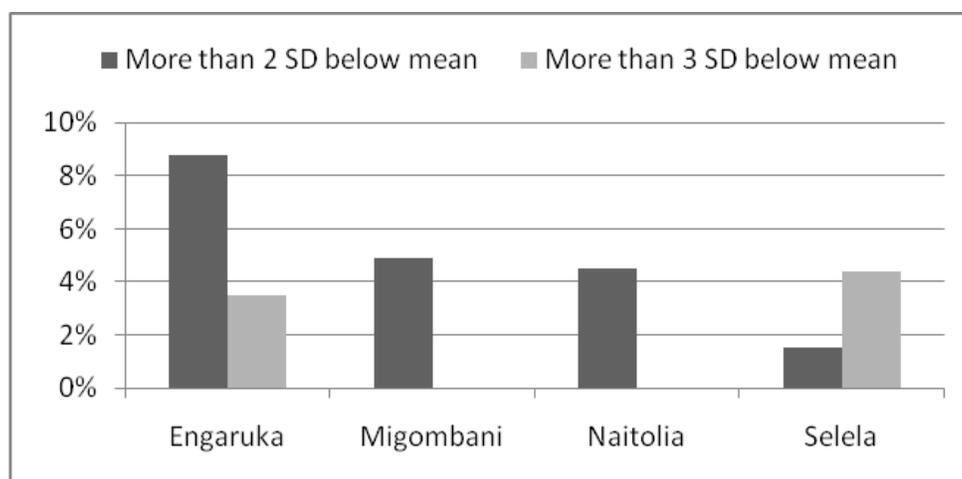
Ugali is the most commonly consumed food by children under five in the last 24 hours in all villages. Three children under five had consumed any meat in the last 24 hours (all three children ate cow), one child had eaten a banana and two children had eaten an “other” fruit, and two children had eaten a legume. In general, consumption patterns shown in Figure 15 indicate that children in Monduli District have limited variety in their daily diet.

If we consider that beef is the most commonly eaten meat source of protein in all villages surveyed and either milk (Engaruka, Selela) or legumes (Migombani, Naitolia) are the most commonly eaten non-meat sources of protein, then we can determine that it is more likely that a child under five will get protein from a non-meat source, specifically milk or legumes, than a meat. Similarly, greens are the most commonly eaten vegetable and bananas the most commonly eaten fruit. According to Figure 15, then, a greater percentage of children in all villages surveyed consumed a vegetable than a fruit in the 24 hours preceding the survey.

The weight-for-height index describes current nutritional status. According to the WHO standards for child growth, children whose Z-scores are below minus two standard deviations (-2 SD) are considered wasted (thin) and are acutely malnourished, and children whose weight-for-height is below minus three standard deviations (-3 SD) are considered severely wasted. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey; wasting may be the result of inadequate food intake or a recent episode of illness causing loss of weight and the onset of malnutrition. According to the data collected by household survey (see Figure 16), nearly 1 in 10 children under five in Engaruka are wasted and considered acutely malnourished.

Severe wasting was not seen in any children in Migombani or Naitolia, but 3.5% and 4.4% of children under five in Engaruka and Selela, respectively, measured as severely wasted.

Figure 16. Percent Children Under-5 Malnourished



4.6.4 Food Security

Of the four villages surveyed in Monduli District, households in Migombani are the most food secure. Less than one-third of households in Migombani had no food to eat of any kind in the past four weeks because of lack of resources to get food compared to over half of households in each of the other three villages. In addition, households in Migombani reported worrying less about food and fewer incidents where household members ate fewer meals, went to bed hungry, or went one day and night without food in the four weeks preceding the household survey. Table 8 shows that Engaruka and Selela are the most relatively food insecure among the villages surveyed in Monduli District.

Table 8. Percent of Households that Experienced a Food Insecurity in Last 4 Weeks

	Engaruka	Migombani	Naitolia	Selela
Worried not enough food	72.0%	44.7%	61.1%	73.6%
Ate fewer meals	68.0%	36.8%	76.7%	70.8%
No food	56.0%	31.6%	52.1%	51.4%
Went to sleep hungry	46.7%	22.4%	28.8%	44.4%
One day and night without food	42.7%	17.1%	16.4%	38.9%

Naitolia is not necessarily food secure, but as the severity of a food insecurity incident increases – e.g. one day and night without food is more severe than worrying about not having enough food – the level of insecurity in Naitolia decreases.

4.6.5 Kitchen Gardens

Very few households surveyed have received training on kitchen gardens (from 0% in Selela to only 10.5% in Migombani), which correlates to a low percentage of households currently growing a kitchen garden: 18.4% in Migombani and only 0-5% in each of the other four villages. Although four households received training on kitchen gardens in Naitolia, no one is currently growing a kitchen garden.

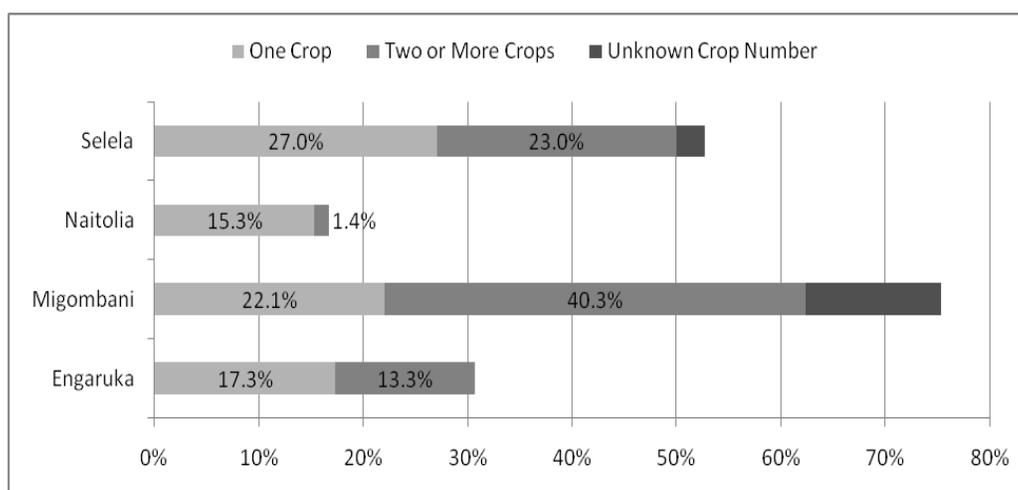
4.7 **Agriculture**

Farmers in Monduli District are predominantly small-scale, subsistence farmers. The mean (average) number of acres under cultivation by household in each village surveyed is: Engaruka 0.76 acres, Migombani and Selela 0.84 acres, Naitolia 1.47 acres. Naitolia has the largest percentage (12.5%) of households cultivating five acres or more; no other village surveyed has greater than 5% of households cultivating as much. Naitolia also has the greatest percentage (84.7%) of households owning any agricultural land; land ownership is lowest in Migombani where only 61.8% of households own agricultural land.

Maize is the most commonly grown crop among households cultivating land in each village surveyed. Bananas are equally as common of a crop in Migombani. Other commonly grown crops include beans, rice, bananas, and tomatoes (Selela only).

Migombani has the greatest percentage of households cultivating any kind of crop and, of those households cultivating, the greatest proportion of households cultivating two or more crops (see Figure 17). Crop cultivation is lowest in Naitolia (16.7% of households surveyed cultivate any crops).

Figure 17. Percent Households Cultivating by Number of Crops Cultivated



In contrast to Migombani, households cultivating crops in the other four villages are more likely to cultivate only a single crop than two or more crops (see Figure 16). Most significantly, in Naitolia, over 90% of households cultivating crops of any kind only cultivate one crop (15.3% single crop cultivation of 16.7% total cultivation = 91.6%).

Jatropha is a fast growing, long-lived, drought-hardy shrub which produces berries that can be used to produce biofuel, oil for soap and other products, and as a hedge to keep out grazing animals. Jatropha plantings promote soil conservation, prevent gully formation, and help reclaim degraded land. Although a high percentage of households have heard of jatropha (80-90%) in Engaruka, Migombani, and Selela, only 35-45% have ever grown jatropha. In Naitolia knowledge of jatropha is extremely low (6.8%); 0% of households surveyed in Naitolia have ever grown jatropha. Current jatropha cultivation is very limited in Monduli District: only three households surveyed have harvested jatropha in the past 12 months.

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 Monduli District. 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	
Engaruka	100%	50%	100%	75%

Migombani	100%	40%	60%	10%
Naitolia	-	0%	100%	75%
Selela	50%	5%	5%	10%

As shown in Table 10, use of inorganic fertilizers is low to non-existent in three of the five villages and organic fertilizer use is low in two of the five villages. Soil erosion was identified as a “very serious” problem in three of the five villages.

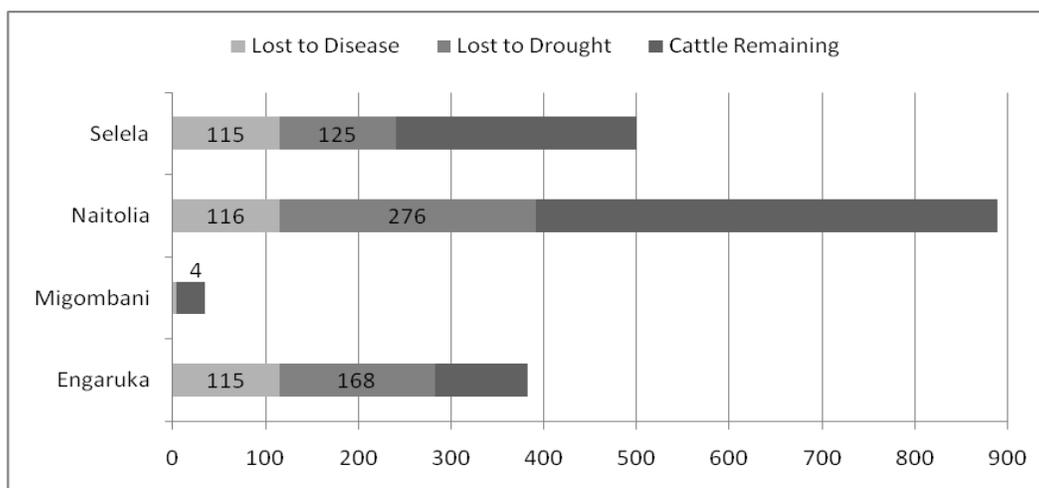
According to the FGD participants, major reasons for crop loss before harvest include floods, droughts, insects, destructive animals (wildlife), and lack of labor; major reasons for crop loss after harvest include decay/rot, theft, and pests (e.g. rats).

Farmers in two of the four villages – Migombani and Selela – were visited by an agricultural extension worker in the past year. Each of the agricultural extension workers visiting these villages was associated with the government. These agricultural extension workers typically trained a small group of local farmers in agricultural best practices and established model farms (growing maize, sunflowers, etc) as demonstration plots. The trained farmers were then expected to transfer knowledge and skills learned to their own farms.

4.8 Livestock

Figure 17 presents data on cattle ownership in Monduli District, and the gross numbers of cattle lost to disease and drought. Since there is large variation between numbers of cattle owned (only 34 in Migombani to almost 900 in Naitolia), a depiction of cattle lost to disease versus drought by percentages would be misleading. For example, only four cattle have been lost (all lost to disease) by livestock owners in Migombani. An increase of two additional cattle lost to disease in Migombani would impact the percentage significantly, but a loss of two more cattle in Naitolia would not noticeably change the percentage given the large gross number of cattle owned.

Figure 18. Cattle Owned, Lost to Disease and Drought



If we remove Migombani, the outlier, from the analysis we can reasonably conclude that although households in Naitolia own the largest gross number of cattle among the other three villages surveyed in Monduli District, it has the lowest total percentage (44%) of cattle lost to either disease or drought (46% in Selela and 50% in Engaruka).

Livestock owners who participated in village-level FGDs feel that cow and goat vaccination is universal, although loss of animals to disease did not substantiate this (20 to 40% of goat herd deaths were attributed to disease). (Quantitative data are not available to corroborate this qualitative assessment.) Diseases against which cows and goats are typically vaccinated include anthrax, East Coast fever, foot-and-mouth disease, worms, sleeping sickness, and Rift Valley disease. In Selela, focus group participants said that goats are vaccinated in order to protect the cows from contracting a disease.

Household survey data show that two-thirds of households in Naitolia own chickens, over half in Migombani do, just over one-quarter in Engaruka and Selela. Newcastle Disease is the number one cause of chicken mortality in Tanzania. Among chicken-owning households, Migombani has the highest vaccination rate, but it is still relatively low with less than 40% of households vaccinating their chickens. Less than one-third of chicken-owning households in the other three villages vaccinate chickens against Newcastle Disease.

Migombani is the only village assessed in Monduli District that has a veterinarian.

4.9 Human-Wildlife Conflict

Qualitative data on human-wildlife conflict were collected through FGDs with men and women, and key informant interviews with village leaders. Qualitative data are not available for Naitolia. Crop destruction by wild animals is 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, water, or reprieve from safari ants.

According to household survey data, a majority of households never ate bush-meat in the last 12 months. Among the four villages, Engaruka and Naitolia had the most households that ate bush-meat rarely (17.3% and 13.9%, respectively) or often (5.3%, 2.8%); only one household surveyed in Monduli District ate bush-meat very often in the last 12 months. Although bush-meat consumption by villagers is rare, poaching by outsiders is not. Key informant interviews conducted in Engaruka and Selela to assess village resources show that outsiders come into these two villages to poach very often.

5 CONCLUSIONS

5.1 Recommendations

It is notable that despite the relative geographic proximity of these villages in a single district that there is significant variation in levels of education, experience of livestock loss, and food security. Issues of quality health care access, quality of education and access to clean water are common for all. Villages also experience different levels of external assistance from government, NGOs and other private sector organizations.

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
- To improve livelihoods, consider infrastructure issues such as access to clean water, electricity, transportation, quality of roads, access to markets, access to credit, and cell phone access.

- Seek opportunities to expand preventive health services as they are cheaper than curative health (examples: improve sanitation and hygiene – increased use of latrines; appropriate disposal of refuse; regular use of soap; training households in point-of-use treatment for water before drinking (chlorine, solar fixes, etc)).
- Repeat basic malaria prevention issues: address standing water issues, killing mosquito larvae, plus low cost - consistent bednet use and regular insecticide dipping
- Before expanding the number of schools, work to improve the quality of education now being offered at each village school.
- Address livestock health issues including expansion of community animal health workers and identify barriers to consistent vaccination of livestock (cows, goats and chickens in particular)
- Agriculture – work with agricultural extension agents to have ‘model’ plots on school or church property to demonstrate best practices; develop networks to access improved seeds and quality agricultural inputs
- Natural resource management – issues of deforestation, poor soil quality, poor/no irrigation techniques, destruction of natural spring areas are widespread – develop community-led land use plans for reforestation and water resource protection; invite developers of alternative biofuel alternatives and train locals in use, develop rainwater catchments such as sand dams, etc
- Land ownership is often a barrier to expansion of agricultural production; address this issue as appropriate.
- Civic engagement – how active are villagers in solving their own problems and developing their own resource networks? What are the opportunities to increase village participation in problem-solving and solution making?
- Wildlife conflict – is there a conservation forum that exists locally to deal with common issues of villagers, wildlife, tourism and hunting and their sometimes conflicting agendas?

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 Monduli 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 and Savannas Forever Tanzania staff and leaders to discuss the usefulness of these data, whether or not there are other indicators that would be meaningful 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 – MONDULI DISTRICT TABLE OF SELECTED INDICATORS BY VILLAGE

Indicators		Engaruka	Migombani	Naitolia	Selela
THE HOUSEHOLD AND HOUSING					
	average household size	5.0	4.2	5.2	5.5
	% of households headed by women	28%	26%	34%	29%
	% of households with modern roof	19%	64%	11%	27%
	% of households using a toilet	24%	99%	17%	35%
	% households use firewood as primary energy source for cooking	99%	92%	100%	95%
EDUCATION					
	% of all adults without education	42%	12%	39%	57%
	% of household heads completed primary school	43%	66%	33%	27%
	% of adult men completed primary school	48%	60%	53%	36%
	% of adult women completed primary school	38%	67%	46%	28%
	Average primary school teacher to student ratio	1 : 64	1: 58/1: 46	1 : 49	1 : 100
	Average primary school textbook to student ratio	0 : 1	1: 4/1:3	1 : 2	1 : 2
	Average secondary school teacher to student ratio	N/A	1:18	N/A	1:25
HEALTH					
	% of households with at least one mosquito net	27%	92%	36%	45%
	% of households that use traditional medicine often or very often	72%	12%	46%	46%
	% of households with protected drinking water	60%	84%	72%	51%
	% of households that take measures to make the water safe	17%	36%	25%	16%
	# of hospital/dispensary/clinic in the village	1	0	0	1
CHILDREN UNDER 5					
	% of children who are treated in hospital/dispensary when ill	84%	98%	88%	87%
	% of children whose birth mother is still alive and inside the HH	100%	93%	97%	99%
	% of children moderately to severely underweight	12%	5%	4%	6%
	% of children who are vaccinated for BCG	88%	93%	97%	88%
	% of children who are vaccinated for polio	93%	93%	94%	90%
	% of children who are vaccinated for DPT	88%	95%	94%	87%
	% of children who are vaccinated for measles	72%	83%	84%	75%
	% of children received Vitamin A supplement	79%	90%	85%	82%
AIDS KNOWLEDGE					

Indicators		Engaruka	Migombani	Naitolia	Selela
	% of men with high AIDS knowledge score (5-6 points)	33%	47%	15%	18%
	% of women with high AIDS knowledge score (5-6 points)	8%	32%	20%	10%
	% of men who have talked with their wife/primary partner about ways to prevent AIDS	82%	89%	60%	62%
	% of women who have talked with their husband/primary partner about ways to prevent HIV/ AIDS	49%	78%	55%	50%
FOOD SECURITY AND NUTRITION					
	% of households worried about food in the past 4 weeks	72%	45%	61%	74%
	% of households ate limited variety of food in the past 4 weeks	80%	61%	88%	88%
	% of HHs went one day and night with no food in the past 4 weeks	43%	17%	16%	39%
	% of households that are currently growing kitchen garden	5%	18%	0%	4%
	Avg # of days/times HHs ate meat protein in past week	1.3	2.5	1.3	1.6
	Avg # of days/times HHs ate legumes in past week	1.9	2.3	2.4	2.0
	# of different types of food eaten in last week	4.6	5.9	4.1	4.0
ECONOMIC ACTIVITY AND INCOME					
	% households own any agricultural land	67%	62%	85%	77%
	Average acres cultivated per household	1.0	1.5	5.9	1.5
	Average # of cattle owned per household	5.1	0.4	12.3	6.8
	Average # of goats/sheep owned per household	25.8	2.4	22.4	21.3
	Average # of chickens owned per household	1.7	3.8	4.2	2.7
	% of HHs whose chickens are vaccinated for Newcastle disease	32%	37%	30%	25%
	% of cattle lost to disease in the past 12 months	29%	11%	12%	22%
	% of cattle lost to drought in the past 12 months	43%	0%	30%	24%
	% of cattle lost to wildlife in the past 12 months	1%	0%	2%	1%
	% of chickens lost to disease in the past 12 months	40%	60%	55%	46%
	% of chickens lost to drought in the past 12 months	4%	1%	0%	1%
	% of chickens lost to wildlife in the past 12 months	34%	11%	23%	22%
	% of goats/sheep lost to disease in the past 12 months	23%	17%	13%	22%
	% of goats/sheep lost to drought in the past 12 months	18%	0%	30%	16%
	% of goats/sheep lost to wildlife in the past 12 months	6%	10%	4%	1%
	% of household heads with the main occupation of farming	51%	80%	44%	51%
	% of HH heads with the main occupation of livestock keeping	39%	1%	40%	38%

Indicators		Engaruka	Migombani	Naitolia	Selela
	% households with bicycle	9%	54%	22%	18%
	% households with radio	40%	72%	33%	28%
	% households with cell phone	8%	55%	28%	20%
CIVIC ENGAGEMENT AND INSTITUTIONS					
	% of HHs that participated in village assembly in past 12 mo	43%	65%	58%	64%
	% of HHs in village gov't or committee in past 12 mo	15%	16%	19%	12%
	% of HHs that asked village leaders for assistance in past 12 mo	11%	17%	14%	20%
	# of village committees/groups	7	9	10	6
	# of NGOs	9	8	7	9
	# of credit, banking services or VICOBA	2	2	0	2