



Population, Health, and Livelihoods in Bukusu Land Findings from the Marakaru Sub-Location Study Site Census

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Hybrid Technologies Project Working Paper #4

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This is the fourth working paper from the research project: “Hybrid Technologies in the Era of HIV and AIDS: The Hoe and the Mobile Phone in Rural Africa” (Murphy, PI). Contact lmurphy2@tulane.edu for more information.

Cover Photo (Figure 1). Women and children during the 2007 village census.

Abstract

This working paper documents village-level population, health, livelihoods and household-level characteristics of the “Hybrid Technologies” study site in Bungoma District, Western Kenya. Data come from the project census, which administered a short questionnaire to all households in the study catchment area over February-March 2007. The village population is about 5200 (from newborns to 92 year olds) in 878 households. They vary not only in age and sex but in education levels (even among children), daily activities, and health status. The age/sex composition shows a classic broad-based pyramid. The labor force works on the farm as well as in non-farm work in the area and across the country. Livelihoods involve both farm and non-farm activities. Typical health concerns include malaria and respiratory infections. HIV/AIDS touches a minority of households, and self-report of HIV infection is rare. Out-migration from households is usually related to life-course, i.e., leaving for marriage (especially young women), schooling, to find work, and upon separation/divorce from a spouse. Deaths occurred in XX households.

Author Biosketch

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1. Introduction

This working paper summarizes empirical findings from 2007 fieldwork in a large village in Bukusu-speaking Bungoma District in Western Kenya. The fieldwork was conducted with the support of an NSF grant on the “Hybrid Technologies” project, an ongoing study to explore and appreciate how mobile (cellular) phones are integrating into rural lives that are shaped by epidemic disease and other forces. Specifically the project aims to reveal how mobile phones are actually being used by rural men and women to make a living, organize their personal and communal lives, and deal with the everyday reality of HIV/AIDS and other challenges.

The village-level interviews constitute a larger case study of the “social shaping of technology” in an African village. The functionality and significance of ‘mobile phones’ and (“traditional”) kitchen gardens are influenced by the demographic, environmental, and socio-economic context of the village, by the AIDS epidemic, as well as by government and international policies and economic forces. These larger forces help shape livelihood activities (farming, non-farm work) and visible outcomes, such as material poverty, innovation, and economic differentiation. While future data collection will provide information about changes over time; a rich portrait of a village at a moment in time is provided by population, health, economic, agricultural and other socio-economic data presented here and in other working papers. These establish the context and baseline to observe how which mobile phones are being taken up and used.

This Working Paper specifically documents findings from the project-led comprehensive survey of households, which comprises a census of the village catchment area described below. Specifically, this working paper will:

- describe the study site population along key characteristics (size, age/sex distribution, activities, household size, working age population, health concerns, HIV/AIDS situation, etc.),
- summarize important livelihood activities for households, most of which are centered around land and farming; and
- document available infrastructure, technology, goods, local, and external organizations that constitute community assets (capital).

The study site

The village is located in northern Bungoma District on the low foothills of Mt. Elgon, at an elevation of about 4000 feet. It is a 3 hour drive north from Kisumu, a 2 hour drive northwest from Eldoret. It is only an hour’s drive to the Ugandan Border at Malaba (See Figure 2: Map of Kenya).

Figure 2: Map of Kenya (attached)

Spanning almost 15 square kilometers, the village is large in extent and in population (Figure 3: Village Map) Still it is a fairly typical rural community in this region. Land is rocky but relatively fertile. Water comes from one functioning borehole built in the mid-1990s, seven public wells, scattered seasonal springs, and a small stream (different water sources are used by different households depending on their location). Buildings and facilities include three overflowing primary schools, three small trading centers comprised of simple kiosks, offering diesel-powered grain mills, small groceries, and popular local beer-halls. Numerous

small churches dot the village. Roads are dirt and impassable in rains, and no motorized public transport reaches the interior. Bicycles (personal and “boda-boda” bicycle taxis) struggle with steep hills. A paved highway skirts one edge of the village, and the other border is remote, lying at the bottom of a small river valley. The village lacks electricity, which runs along the main paved road only. No landlines or public phones exist (neither Kenyan government “TelKom” nor other community wireless public phone (“simu ya jamii”). The nearest public phone is the wireless simu ya jamii, found in Mayanja, a ½ to one hour walk and/or 20 Ksh bus fare. The nearest telephone landline is in Chwele, a new district capital, and Ksh 40 fare round-trip on the main highway. Cellphone towers were not visible in 2005, but now dot the countryside around the village, and cellphone service is good (See working paper 1 & 2).

Figure 3: Village Catchment area sketch map

The data

The paper draws on the household survey (census) administered in the village catchment area using specially designed instruments. The household survey first involved listing all “households” in the catchment area, with the help of long-term local residents, then finding and interviewing a responsible adult in each household (usually the male head or his wife, but sometimes a grown son or daughter). The composition of the household was documented in the roster as a part of this survey, which provides a census of the village. The roster provides data on individuals’ age, sex, marital status, religion, education, how long resident in the household, other residence, activity/occupation, health/illness (and phone ownership). The roster on its own is used to provide population-level measures: the pyramid, density, and other characteristics in section 1 below. This paper also draws on the rest of the household questionnaire, which provides information about land, tools, housing and other assets, crops, livelihood activities, and technologies used by households. The household questionnaire links to the household roster data with a unique household identifier to enable calculation of the age/sex composition of households, illness, HIV/AIDS status, multiple residence and their use in cross-tabulations. The survey included a separate interview with an adult about phone use and benefits, information which is summarized in working paper #1.

Numbers of households and non-response

The aim was to capture all households listed as resident in the catchment area. After three return visits (“call-backs”), only 8 households “refused” to respond (in some cases, incapacitated or ill), 10 were at another residence, 6 were “away” (not at home) and the remainder households (of 30 non-response) that had dissolved or migrated. This reflects 97% response rate, a favorable return likely due to collaboration with local elders in planning and implementing the survey. Also, as it is a census of the area, neighbors observe the field team and began to expect their visits.

2. Demographic and Health Situation

The Population...its size, age/sex distribution, density, and history

The population of the catchment area is about 5200 people (from newborns to 92 year old widowers) belonging to 878 households listed in the catchment area (30 non-response). This figure is based on 5056 documented in household rosters for 848 households who provided information, plus an estimated 100-150 residents in 30 “non-response” households (estimated at 3 to 5 persons per household, 5 being the median size).

The population resides in a contiguous catchment area of 2374 acres spanning roughly 3 by 5 kilometers (see map in Figure 1). This corresponds with the historic study village (Greater Kakichuma). Spatially, the population is scattered fairly widely across the study area, spanning 6 distinct sub-villages (see Figure 2, Village map). Ancestral homesteads are home to several households in several mud (wattle and daub) or brick houses sharing a compound bordered by a sisal plants, thicket, a Euphorbia hedge, or fence. Some population clustering is visible along the paved highway and areas where farm size is decreasing through fragmentation, related to sale and inheritance. Three small market centers have rustic shops and kiosks and a few rental properties for landless people. (Anecdotally, we know that individual huts on farmland are rented out depending on the family's needs and mobility of members.)

The current aggregate population density is 544 people/sq. km. This figure is higher than is found in semi-arid agricultural regions of Kenya such as Machakos District, but lower than found in densely settled farmland around Kakamega to the south of the study site. In the late 1920s, a British colonial government "Committee Report" mapped the estimated density in the study area at "between 5 and 100 people per square mile". Density to the south near Maragoli (where lands are more fertile and watered) was even then much higher at over 500 per square mile. The Maragoli area remains densely populated. This region of Bungoma has been settled by the Bukusu and other Luhya tribes for many generations. Study site informants trace their ancestors residence in the village back to the early 1800s. Then, Bukusu clans settled all together within fortified compounds, but now they live in the typical small mud (wattle and daub) or mudbrick houses found in rural Kenya.

Figure 4. Landscape of village

The population has grown at a steady, fast pace over recent decades, based on the project census (in-migration, time on farm, family size) and key informant interviews about the history of the village. (No official government census data were readily available for comparison.) The project survey data revealed over 600 distinct 'homesteads' recognizing ancestral lands that are passed down through families. Interviews with elders suggest that population was low in the 1960s, on the order of dozens of homesteads (with a few households each) across the large village. The age/sex distribution is captured in Table 1 (the numbers) and the population pyramid (Figure 5).

Table 1. Age/sex distribution of the population

Figure 5. Population pyramid

Its symmetrical shape and wide base reflect sustained high fertility and in-migration over the years. Age heaping (at 10 and 20 years) is evident. Children under 15 make up 50% of the population, 16-65 year olds 47%, and "over 65" just over 3%. The number of dependents (<15 + >65) to working age adults (15-64) is 2510:2533 (a ratio of 1: 1.01). Number of young children (<5) is 850 or almost 17% of the population. 260 live infants up to a year old (12 months of age) were reported for 254 study households. An infant arrived in the last year in about 30% of households. (These figures do not account for recent mortality of <1, which will follow and must be included for a crude birth rate).

The M:F ratio is balanced overall at 1:1 for the total population and working-age, but imbalanced at 1.2:1 for the over 65. The nominally balanced M:F ratio probably over-estimates the actual male labor force available on a day-to-day basis, since almost a quarter (22%) of adult males “usually work away” from the farm, vs. only 5% of adult women (also see below on “activities”). At the population level, the workforce is evidently plentiful, but there can be household-level shortages or surpluses for given productive assets as able-bodied workers leave (for school or marriage), migrate in (with marriage or upon purchase of land), are taken ill, etc.

By relationship code from the roster: 14.6% of the population are in a position of male head of household, 16.6% the female head (with a spouse or alone: n=838). An estimated 109 households (13%) are “female-headed” (i.e., where the female head (“relate=2”) is “personid = 1”). Over half (58.1%) are children of the head. The remainder are other blood relatives (brothers, sisters, cousins, grandchildren), relations through marriage, orphans and foster children, plus a few unrelated residents.

Multiple Residences. Households also have other homes: 377 individuals in over 200 households have an “other residence” beside the village home where they were interviewed. These are within and usually outside the study catchment area, either in nearby market towns (Chwele, Kimilili, Mayanja), centers (Bungoma), Rift Valley urban centers (Nakuru, Gilgil), Nairobi, and as far away as Mombasa and Kampala. 129 of these individuals with another residence (58%) are the male household heads, another 28 are female heads, and 64 are biological children of various ages (i.e., from young children to working age adult children of the household head).

Education, religion, ethnicity

The population is nearly universally of Bukusu descent and Bukusu (dialect of Luhya, a Bantu language) is the language spoken at home in >99% of survey households. An exception is a family that speaks a language native to Uganda. Christianity is nearly universal, reflecting British and American missionary influence since the 1900s: The Salvation Army missions opened in Bungoma and were operating by the 1920s near the study site.

Most common affiliations today are

- Pentecostal (38.6% of the population, associated with 287 male heads and 325 female heads),
- Roman Catholic (26.5%, associated with 206 male heads and 217 female heads), and
- Salvation Army (27.9%, associated with 191 male heads and 234 female heads).

A much smaller number are associated with Friends/Quakers (2.7% of individuals, 21 male heads and 24 female heads). Seventeen individuals are Muslim, associated with 3 male heads of households. Handfuls belong to the Africa Inland Church (AIC), Seventh Day Adventist (1 hh), and the Bungoma-based Dini ya Musambwa (11 people, associated with 4 male and 5 female heads). (The latter sect dates to a charismatic Bukusu leader in the 1940s. He was feared by British colonial authorities, who labeled this affiliation a cult.) 164 individuals are in ‘other’ religions (associated with 24 male and 27 female heads).

Education levels for adults range from none to college degrees. For working age adult respondents (n=2527): 117 (4.6% of the working age population or WAP:, 90/117 of them women) have no schooling. Another 1202 (47.5% of WAP, 619 of them women) have received “some primary” (implying they had to drop out due to lack of fees or demands at home). Another 516 (20.4%, 264 women) “completed primary”, 373 (14.7%, 162 of them women)

“some secondary”, 215 (8.5%, 84 of them women) “completed secondary” (called “Form Four” in Kenya). Another 81 (3.2% of the WAP, only 21 of them women) have gone “beyond secondary”. We know that these individuals (mostly men) work now in occupations such as veterinary medicine, pharmacy, in education, business, and accounting. Another 7 adults (1%, 5 women) have received adult education: this is probably basic literacy.

For children of school-going age (i.e., 7-15) attending school is common but not universal. While most of the 1311 school-age children are “usually at school” or “helping with chores” and report at least some primary, 35 have no schooling, and many older children have incomplete primary (i.e., 134 youth aged 15-19 have only “some primary”). Non-universal school enrollment rates among children suggest the failure to uphold the national policy of “universal primary education”.

Health

The respondent was asked to identify members of the household who have “been ill in the past 12 months”. A total of 1408 individuals (27.8% of the population in XX households) have been ill in the past year. This includes 311 children (under 5) and 68 older people (over 65). Over half (53% of the 1408) were females: 284 were women of “reproductive age” (15-49). Of the 1408 reports of illness, 394 (7.8% of the population, or 28% of all cases of illness) lasted for “more than a month”. More women (n=227, 58%) than men reported a chronic illness. 123 cases were children under 15 (60 cases were children under 5).

Common symptoms or complaints based on inspection of voluntary reporting of the type of illness include ‘malaria’, ‘fever’, ‘chest’, and ‘cough’, as well as broken bones, accidents, and wounds. Malaria evidently is severe enough to lead to death.

Health professionals at the nearest health center (Kabuchai) serving this and other villages were interviewed: The Clinical Officer (in March 2007) confirmed that malaria as one of the most common problems they see in both adults and children, followed by diarrhea (in children), pneumonia and upper-respiratory tract infections (in children), anemia (adults and children), eye infections (adults and children), syphilis (adults) and ear infections (adults and children). Malaria is particularly common from March to August, and sometimes presents as advanced cases in children, having been treated at home only.

HIV/AIDS

Reports of Chronic illness, combined with the presence of several specific symptoms of ‘rash,’ ‘fever,’ ‘diarrhea,’ and ‘wasting,’ is indicative of advanced AIDS: 72 individuals reported this combination. Self-reported HIV+ status or AIDS is rare (6 deaths in past five years were attributed explicitly to HIV/AIDS).

According to the project survey, currently: 22 households have HIV/AIDS infected persons, 111 have chronically ill individual, 33 households experienced ‘prime-age’ mortality among 16-65 year olds (in the past 5 years), 79 are caring for (233) OVCs, and 42 households have suspected HIV/AIDS cases. Another 13 have had young children die (in the past 5 years), possibly due to HIV infection. These indicators suggest a modest, controlled (through treatment), generalized epidemic. For comparison purposes, key informant interviews in July 2007 in another study site in much harder-hit Suba District in southern Nyanza, settled by Luo people, suffered 5 adult AIDS deaths in the past year alone, in a village of 100 households. Elsewhere in Bungoma, the HIV infection rate is estimated at about 7% (GOK 2006?).

The project also gathered data from key informant interviews with home-based care (HBC) workers in the village. From this meeting emerged a tally of HIV/AIDS affected people in the catchment area:

- 8 individuals are known to be on ART,
- 3 bed-ridden due to AIDS,
- 12 households have dissolved as a result of AIDS,
- 4 households involved widow-inheritance (following AIDS-related death), and
- 13 individuals were known to have died from HIV/AIDS.
- 3 known cases of AIDS-related deaths among children were noted.

There are likely other people who are HIV+, on ART, bed-ridden, or managing with AIDS, but who have chosen not to know or reveal their status to the HBC team.

By the time of the survey, anti-retroviral therapy was already available and free of charge through two sources: Lugulu Mission Hospital (Kimilili, a Quaker institution, offering the favored health care that came eventually via mobile clinic to the outskirts of the village) and Bungoma District Hospital (in Bungoma town, the district capital, a less desirable facility). It is possible that by the time of the survey most HIV+ adults were quietly getting tested and treated and managing their disease.

Household composition and "out-migration"

Households are the primary economic unit of organization of work and consumption, as well as the entry point to data collection. For 848 households, an adult informant—most often the female head of household—provided details for a roster of people living together and "eating from the same pot," (This is the accepted definition for a household used in many national Kenyan surveys.) This does not imply kinship, but is usually correlated with the nuclear family.

Households range in size from one person (i.e., elderly widows) to extended families of 17 people. Most common are households with 3-8 members. The median age of the male head of household is 44 and of female heads 39 (Table 4). Most are male-headed (733). A rough estimate is 108 "female-headed" (relationship=2 and personid=1). Most households are composed of the male head and female spouse, their own children by birth, as well as step-children. Many other people join these households, including step children, foster children (sometimes 'OVCs), grandparents, cousins, and non-family members.

Table 4. Household demographic characteristics

Many households are still affiliated with ancestral "homesteads" often headed by the male patriarch of an extended family. Over 600 homesteads were listed in the census catchment area representing 878 households (848 of which were interviewed).

Origins and Duration on the Farm. Most male heads were evidently born on the land where they now reside: 562 (76%) of household heads ("age - howlong"). Another 5% settled on their current plot within the past three years, either as in-migrants or having just started a family and been given land. Almost 13% of male heads "arrived" in the past ten years, about a quarter of which have another residence.

A much higher proportion (25%) of female heads arrived in the past ten years. Women in this Bukusu culture generally marry into the male lineage, so most adult women who are spouses (or widows) of the head of household will have moved to the current household when they

married. Marriage, whether legal and official or customary through co-habitation, is expected, the norm, and still common at a fairly young age. (A rough estimate of age at marriage can be suggested by the difference between a married, separated, or widowed woman's current age and the duration she has been in the household. For just women under 30, this might be as young as 12 or 13, with large numbers marrying at 15-16.)

Polygyny, in which a man has multiple wives at the same time, persists. It is found even among younger men (aged ~30), but is less common than before. Less than 10% of female heads in 84 households are associated with a polygynous relationship. These 84 women are linked to 36 men aged 29 - 70+ : 28 have 2 wives, 7 have 3 wives and 1 has 4 wives.

Previous members of the household. A second roster compiled data on household "other members who used to stay/live in this household but have left or passed away in the past five years, (i.e., since 2002)". About 40% (339 households) reported at least one individual who left the household in the past five years, either having passed away or gone away for schooling, marriage, work, or other personal or economic reason. Among them, 215 households (a quarter of the study households) were affected by the departure of a person of "working age" (15-59). Common reasons for leaving are for marriage, which accounts for over half of out-migrants (esp. young women: 208 vs 83 men). Others simply "moved away" (33 males, 30 females). Children left for school (9 boys and 13 girls) and adults to seek work (7 men, 4 women) or after a divorce/separation (for 9 women). "Other" reasons were noted for 19 males and 33 females—these are often family-related as well. Most individuals who left were the children of the head of household.

Deaths were reported for 128 individuals in 12% (about 100) of households. About half of deaths were of "working age" people (15-59). Six were directly attributed to HIV/AIDS (explicitly mentioned voluntarily by the respondent). Other causes mentioned in relation to these deaths include malaria, meningitis, TB, pneumonia, cancer, childbirth, measles, diabetes, diarrhea. As well, vague problems were mentioned, such as 'chest', 'swelling', 'stomach'. Deaths were also evidently caused by 'poison', 'drink', 'thugs', suicide, and 'age'.

(Note that study households might have experienced the death of other family and household members who were not recorded in the "Previous Members" roster. In some cases they may not have been considered members of the household, but resided elsewhere. The roster also does not collect information on deaths or out-migrations prior to the last five years, i.e., this affects much older households whose children have left, husbands have died from 6 to 30 years previously).

3. Land and Livelihoods

The village is characterized by small, mixed farms, i.e., households growing a variety of food and cash crops. Many households have members who work off-the-farm for wages or income, either in manual agricultural work elsewhere, or in more lucrative non-agricultural trades and professions.

Land use and tenure

Farm size varies from small plots of 0.125 acre to a large area of 53.5 acres (owned by an elderly gentleman who has not yet subdivided to numerous sons). Most farms are 1-2 acres, and only 2% are larger than 10 acres. The land is typically owned, passed down through inheritance from father to son: (women can be evicted and some cases were given). Most respondents (96%) bought or inherited land, as little as 1/8 acre. The largest farm is 53.5

acres. Increasingly, according to key informant reports, portions of farms are sold off. About 25% report renting and a small minority (6%) sharecropping or using some other arrangement (4%) to get access to land. Very few (3) households interviewed are landless. At least 260 (31%) of households worked multiple parcels (in the site or outside), and 33 (4%) have land in other villages and even districts. Having land elsewhere reflects in-migration, inheritance, and investments).

Table 5: Land Size and Tenure

The study site encompasses several sub-villages. The historic village Kakichuma has been further sub-divided and jointly have (196 + 62 + 25) 283 individual parcels ranging in size from XX to XX (median:). The subvillage of Kikwechi reports 238 (of 848) households in the study with land size XX (range X X). Other main divisions are Nabukhisa (163 of 848) which is central to the site (bordering the Toloso). Kabusasi (116 of 848 households) is nearest the road. Chebunyinyi holds 28 households. Households reported in Kimukungi, Sasuri and Sikusi number 13 (these are small market centers also close to the main road).

Several non-resident land owners managing parcels within the study site. Since there is no resident household associated with the land, no interviews were conducted with the owner. Follow up with key informants from the village would be needed to identify and describe those properties. (In other words, the roughly 2374 acres of farmland accounted for in the data as reported by the study respondents does not precisely correspond with the "15 square kilometers" of the catchment area in Figure 2, since some parcels were not accounted for, and some of the household's parcels are located outside the study site.)

Livelihood Activities

Farming is the basis of most livelihoods. Land is used for mixed farming of annuals, legumes, perennial crops (coffee, pepper, bananas, papaya, plantains) which comprise a major livelihood activity. A few head of cattle are owned by XX households. Herds are much smaller than they used to be: the largest herd today is < 20). Fallowing of land is not common, since parcels are small: 120 respondents reported 198 acres in total. Much of this is a 33 acre plot in fallow associated with one farm.

Respondents were also asked about the activities they engage in to get food and income for the household. The respondents were also asked, for each activity that they engage in, whether the activity is not important, moderately important, important, or very important to the household. Frequencies related the prevalence of activities and their perceived importance (Table 7).

Table 6. Land

Most common is 'own farm' crops, important or very important for about 90% of that group. Next is "selling crops from own farm". After that, communal activities, exchange of goods, and casual labor are reported by almost half the respondents. Sale of pottery/charcoal, running a business, trading in crops, remittances, renting out land are common. Charitable donations and pension are uncommon but significant to a minority.

Farming crops, managing kitchen gardens, and raising small livestock and sometimes cattle are a source of food and income for nearly all households. Typical crops grown are maize (the staple food), beans, plantains/bananas, and sweet potato (in the fields) and onions, tomatoes, leafy greens, and various fruits (in the garden). Cash crops include sunflower, cotton, tobacco, coffee, pineapple, and others. Dozens of different crops for food, fuel,

fiber, fencing, and cash are grown in the village: see Murphy 2008 for description of kitchen gardens and innovations in gardens and crops specifically in relation to HIV/AIDS.

Various “non-farm” activities (i.e., not involving tilling the family land) are a complement to farming, including casual work, (i.e., daily, low-wage work in construction, harvesting, sugar industry). Professional work in accounting, veterinary practice, or shops in Bungoma town are mentioned. 37% of households run a small business, often simply buying up and reselling crops from other farms or running a *posho* (grain) mill. Trades such as carpentry, bike repair are represented in the village.

Non-monetary exchanges are common. Nearly half the sample share labor, working on each others’ farms for the harvest or preparing land; and/or to exchange goods (probably bartering food products). Additional sources of cash include remittances from family members working elsewhere, pensions (from government mostly: a few retired civil servants) and donations. About 20% of the sample report relying on remittances, another 18% rent out some of their land, 8% rely on donations, and ~5% earned a pension.

Most farm-based activities as well as small income generating activities rely on simple hand tools. Typical tools are hand hoes, panga (machete). (See Table 7) Poor households own few of these in poor condition. Better-off households own more of these, buy new more often, and accompany them with ploughs, wheelbarrows and chemical sprayers.

Figure 6. Typical hand hoes in use

Table 7. Tools owned

Additional research will investigate patterns of livelihoods, assets (productive and consumer goods) and population in the village.

Endnotes

1. The Village Census

The second round of data collection in 2007 (funded by NSF) was comprised the entire ~15 sq km village catchment area with a household survey, thus providing a census of households and mobile phones. A simple household level questionnaire was developed, translated and administered from February 3 through March 10, 2007 by trained, Bukusu-speaking enumerators. They interviewed a responsible adult male or female head for UeveryU family grouping that “eats from the same pot” within the catchment area. These numbered 878, including 29 cases of non-response due to the family being away, incapacitated, or refusing to participate. A household roster gathered standard data on age, sex, education. Other questions enquired about livelihood activities, land, crops, tools, housing, and assets.

The census effort included an “individual-level” questionnaire to investigate mobile phone use among adult owners identified through the household-level instrument. This questionnaire gathered information around handsets, SIM cards, expenses on charging and airtime, benefits, problems. Pretests and prior discussions with key informants revealed that mobile phones in rural households in western Kenya, while widely shared with other family members, neighbors and friends, are generally controlled by a primary owner. The phone does not belong to the family/household, but a specific person. Thus, the Uprimary ownerU was specifically sought out in households that were identified through the village census as having at least one household member who owns a phone. This sometimes required several

call-backs, in the case where members work away much of the time. Non-phone owning households were asked about reasons for not owning, ever use of a mobile phone, and perceived benefits and problems. These findings from the census of the village are summarized in project Working Paper #1.

The research was approved by the Tulane University Institutional Review Board (IRB) and received research authorization from the Kenyan Ministry of Education, Science and Technology (MOEST). All participants were invited to take part using approved oral consent procedures, and interviews and activities were conducted in Bukusu or Swahili, and translated by local research assistants.

2. HIV/AIDS Data

During the census and other data collection efforts, several proxy measures of HIV/AIDS were used, rather than expensive biomarker data. The household roster asked for information about health status and chronic illness (lasting more than a month) and symptoms of weight loss, fever, rash, and diarrhea associated with such cases which are associated with HIV/AIDS. Orphans and foster children can be identified in household rosters. Discussions with local home-based care workers (in 2005 and in 2007) enabled a separate tally of affected households, perceived trends in infections, access to anti-retroviral treatment and applications of mobile phones by these lay health care workers in their HIV/AIDS outreach. Finally, Focus Group Discussions (four by the time of writing) talked with men and women about different aspects of HIV/AIDS. These data are not summarized in this working paper, but do help interpret comments made during phone use interviews by HIV/AIDS-affected individuals, home-based care (HBC) workers and HIV/AIDS support group members.

Table 1. Population of Catchment Area Disaggregated by Age and Sex

Age Group	Male % age % all M	Female % age % all F	Total Row % Cum %
Under 5	430 50.6%	420 49.4%	850 16.8%
	17.0%	16.6%	16.8
>=5 - < =9	401 48.0%	434 52.0%	835 16.5%
	15.8%	17.2%	33.3
>= 10 - < 14	333 49.7%	337 50.3%	670 13.3%
	13.1%	13.4%	46.6
15 -19	313 49.6%	318 50.4%	631 12.5%
	12.4%	12.6%	59.1
20-24	253 50.6%	247 49.4%	500 9.9%
	10.0%	9.8%	68.9
25-29	172 51.3%	163 48.7%	335 6.6%
	6.8%	6.5%	75.6
30-34	117 46.2%	136 53.8%	253 5.0%
	4.6%	5.4%	80.6
35-39	103 53.9%	88 46.1%	191 3.8%
	4.1%	3.5%	84.4
40-44	85 53.8%	73 46.2%	158 3.1%
	3.4%	2.9%	87.5
45-49	85 50.3%	84 49.7%	169 3.3%
	3.4%	3.3%	90.8
50-54	61 45.2%	74 54.8%	135 2.7%
	2.4%	2.9%	93.5
55-59	54 58.7%	38 41.3%	92 1.8%
	2.1%	1.5%	95.3
60-64	34 49.3%	35 50.7%	69 1.4%

	1.3%	1.4%	96.7
65-69	30	25	55
	54.5%	45.5%	1.1%
	1.2%	1.0%	97.8
70-74	29	23	52
	55.8%	44.2%	1.0%
	1.1%	.9%	98.8
>=75	26	22	48
	54.2%	45.8%	99.7
	1.0%	.9%	
Missing	7	6	13
			0.3
Total	2533	2523	5056
	50.1%	49.9%	100.0%

Notes

Median age (50% below this age): 15 years

Mean age = 20.6 years

Range: 0 to 92 years (N=5043)

Reports of illness

1408 individuals, 27.8 of the sample

395 reported illness lasting ">one month"

Table 2. Usual Daily Activity, Disaggregated by Sex and Working Age Group

Activity	Adult		Under 15		Over 65		Total
	Male N, column %	Female	Male	Female	Male	Female	
Regularly Work here (Farm/Household)	535 41.9%	834 66.4%	19 1.6	23 1.9	70 82.4	62 88.6	1547 30.6
Usually Work Away (income-generation)	276 21.6	61 4.9	0	2 0.2	4 4.7	0	344 6.8
Usually Away at School	355 27.8	299 23.8	646 55.5	671 56.3	0	0	1974 39.0
Help with Chores	56 4.4	40 3.2	124 10.7	133 11.3	0	0	359 7.1
Other	37 2.9	12 1.0	0	0	4 4.7	0	53 1.0
No Activity	18 1.4	10 0.8	375 32.2	362 30.4	7 7.6	8 11.4	780 15.4
Total	1277	1256	1164	1191	85	70	5057

Data from household roster question: "Main daily activity most of the year"

Multiple Residence

N=377 individuals (246 men and 131 women; 7.5% of 5038 for which we have data) report having "other residence". Of these:

>290 are working age (15-65: 194 Men, 96 women) and

>103 are men who regularly "work away"

Table 3. Education levels attained by age group

	Education level								Total
	None	1	2	3	4	5	6	Missing	
0-5.00	750	96	0	1	0	0	0	1	848
10.00	137	683	5	2	0	0	0	7	834
15.00	6	636	12	13	0	0	0	3	670
20.00	7	458	67	79	11	1	0	6	629
25.00	8	234	109	88	43	15	0	1	498
30.00	8	133	94	44	41	15	0	0	335
35.00	2	97	69	40	32	10	0	3	253
40.00	4	62	57	33	27	6	1	1	191
45.00	6	57	36	32	18	9	0	0	158
50.00	17	58	30	30	18	11	2	2	168
55.00	33	40	20	17	14	7	2	2	135
60.00	17	35	15	8	9	4	2	1	91
65.00	15	28	19	2	2	3	0	0	69
70.00	12	24	13	3	1	2	0	0	55
75.00	12	31	5	0	0	3	1	0	52
>75	21	20	5	0	0	1	1	0	48
8888	1	10	2	0	0	0	0	0	13
Total	1056	2702	558	392	216	87	9	27	5047

Notes

1. Age groups refer to 0 to under 5, age 5 to under 10, age 10 to under 15 etc.
2. Education levels as reported on roster: 0 = no primary, 1 some primary, 2 primar complete, 3 some secondary, 4 completed secondary, 5 beyond secondary, 6 adult education

Table 4. Household Demographic Composition, History, and Characteristics

Mean size of household:	5 persons (1-17)
Mean age of male head (n=733):	43.6 (20-89)
Age of Female head (n=837):	39.1 (16-90)
Male heads in polygamous union	36/733 (2-4 wives)
Female heads associated with polygynous partner	78/837

<u>"How long" here:</u>	<u>Male heads (733)</u>	<u>Female heads (837)</u>	<u>FHHs* (n=108)</u>
Mean # yrs	36.5 yrs (0-88)	19 yrs (.08-88)	36.4 (.16-84)
% <=1 yr	2.5%	6%	2.8
% <=3 yr	5.0	14.5	5.6
% <=10 yr	12.7	25	13.9

Previous Members of the Household

# households reporting <u>any individual</u> (living or deceased) left in past 5 years:	339
# individuals who left (among households reporting any):	583 (1-9/HH)
# working age adults who left in last 5 years:	374 (in 215 HH)

Reason for departure (other than death)

	M	F	Total
Get married	83	208	291
"Just moved away"	33	30	63
"Other"	19	33	52
For School	9	13	21
Find work	7	4	11
Separation/divorce	-	9	9
Go to Hospital	2	1	3
Total	220	360	581

Deaths

Working age adult (15-59):	56 (42 HH, 1 -5 deaths)
Infant (<1 year):	8
Child (1 - 5):	24
Older adults (>=60):	32
Total (all households):	128 individuals (XX HH)

Table 5. Land area and Land Tenure

Total size of land area* in use (acres): Median < 2 acres (0 to 53.5), mean 2.8

*All land owned, rented, sharecropped, or other tenure arrangement

/% Reporting land in this tenure category (# add up to >848 because of having >1 plot of land)

Own land:	816 (96%) bought or inherited 1/8 to 53.5 acre
Renting:	209 (25%) rent ¼ to 7 acres (median <1 acre)
Sharecropping:	53 (6%) (¼ to 35 acres (median ~1.5 acre)
Other land use arrangement:	36 (4%) have access to 1/8 to 28 (median < 1 acre)
Large farms:	17 (2%) are large farms over 10 acres
No farmland (i.e., just house plot):	3 households

Location of land parcels: # / % with

Land <u>only within</u> the study area:	816 (86%)
Some land <u>outside the study area</u> :	33 (4%)
Have <u>multiple parcels</u> anywhere: (whether own, rent, sharecrop, etc)	260 (31%)

Farm land by major divisions (sub-villages)

Chebunyinyi:	28
Kakichuma:	196
Kakichuma A:	62
Kakichuma B:	25
Kikwechi:	238
Kabusasi:	116
Nabukhisa:	163

Additional Locations (market centers within study boundaries)

Kimukungi:	3
Sasuri:	3
Sikusi:	7

Total with land within study site: 841

Elsewhere (land outside study area): 8

Land Use

Kitchen Garden: 720 (84.8%)

Fallow Land (“not in use for crops or animals”): 120 (14%) (mode: ½, median: 1 ac)

For 17 large farms >10 ac: 7 (41%) (range: 1/8 to 33 ac)

Table 6. Livelihood Activities

"Do you ... *	% "Yes"	<i>Not important</i>	<i>Somewhat important</i>	<i>Important</i>	<i>Very important</i>
...eat crops (food, milk) from <u>your</u> farm?" (i.e., "own-farm" production)	99	<1	9.4	23.7	66.2
...sell your crops for money?"	82	1.3	24.3	35.1	39.3
...Sell other crops <u>not</u> from your farm?" (i.e., a trader)	30.3	<1	27.1	43.9	28.2
...Do casual labor?"	42	1.4	29.7	42.4	26.6
...Get money from sale of pottery, charcoal, etc." (sisal, hoe handles, bricks)	37.8	<1	28.4	48.1	22.8
...run a business?" (e.g., posho mill, shop)	37.4	1.3	19.7	47.9	31.1
...Get donations from family members elsewhere?" (remittances)	20.4	--	34.7	41.6	23.7
...earn a pension?"	4.1	--	16.7	47.2	36.1
...exchange goods?"	50	1.0	26.6	55.8	16.6
...work in communal activities/merry go rounds?"	52.1	1.5	9.1	50.6	38.8
...Get donations from unrelated members?" (i.e., charity, aid)	8.7	1.3	39.5	35.5	23.7
...sub-let or rent land?"	19.6	3	17.6	24.8	54.5

Source: 2007 project survey data for N=846. Respondents number 849 in total, but 3 cases are missing data on livelihood activities. The respondent was ask a series of questions which were based on prior knowledge of the community and pre-tested. (Translated from Bukusu:) "Do you...? " For each activity, if they said 'yes', the were asked to rate its importance to the household.

Table 7. Farm Tools Owned and Used in the Village

Tool	N/% Own At least One	N/% borrow or rent	Comments
Hoe	96% (1) have access to	77% : their 2 nd or 3 rd hoes	Simple 2-3 pound, short-handled, using manufactured head
Panga/machete	683/80.4	126/16.7	Simple long blade
Axe	362/42.6	312/36.7	Locally made handles
Sickle	270/32.0	216/27.5	Used for harvesting
Slasher	245/29.0	167/21.5	Used for cutting grass and thatch
Spade	233/27.4	205/26.1	Or shovel for digging
File	240/28.3	161/25.2	Used for sharpening pangas and other tools
Watering can	222/26.2	247/31.5	Often home-made
Plough	205/24.2	373/47.4	More commonly rented than owned: pulled by team of 4 - 6 oxen.
Sprayer	154/18.2	290/36.8	Used to apply pesticides to field crops
Fork hoe	117/13.8	160/18.2	Used for composting
Wheelbarrow	91/10.8	180/22.8	
Rake	64/6.4	130/16.3	
Treadle pump	16/1.9	72/9.0	Moneymaker type used to pump water
Cart	9/1.1	95/12.0	
Other	6/.7	4/0.6	hand saw, hammer, jerrycans for water

Notes

1. Hoes are the most common hand tool, and fairly inexpensive (Ksh 150-300 depending on the size). But 15 households have neither own nor borrow, while 23 households only borrow or rent (they have access, although they do not own a hoe). They do wear out quickly in rocky soils.

2. Most commonly rented or borrowed, in order of percent households reporting use: Ox-plough, axe, sprayer, spade, wheelbarrow, treadle pump, cart. Some of these are more frequently 'rented/borrowed' (from friend, neighbor, or in an exchange) than owned, owing to the cost. Ox-plough, chemical sprayers, wheeled carts, wheelbarrows, etc. are orders of magnitude more expensive than the simpler hand tools, running Ksh 3000+, much higher than the price of hoes, axes, sickles, and files (under Ksh 500 each).

Figure 4. Landscape of Village (showing two members of survey team)



Figure 5. Population Pyramid for the Village (Feb/March 2007)
(DRAFT—need to do updated pyramid with corrected age/sex data)

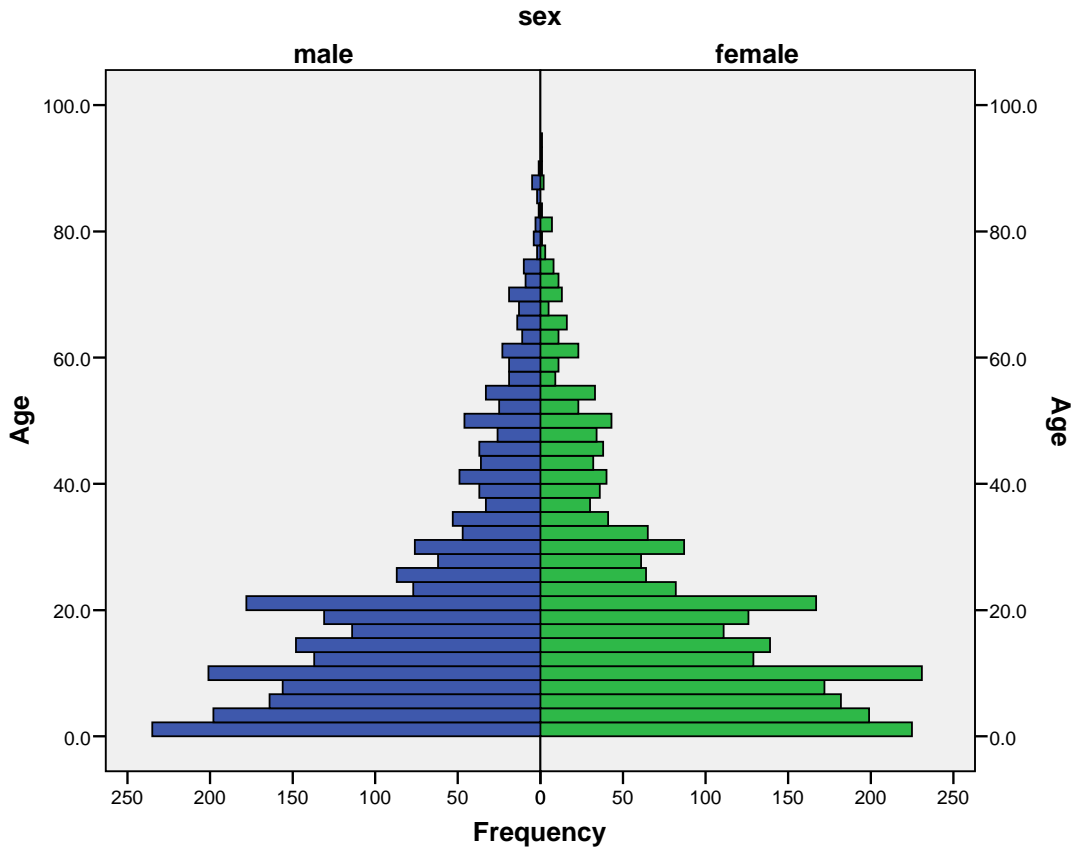


Figure 6. Typical hand-hoes in used

