

## **‘My co-wife can borrow my mobile phone!’: gendered geographies of cellphone usage and significance for rural Kenyans**

### **Abstract**

A unique census of cellphones in a Western Kenyan village reveals gendered dimensions of access, intensity and breadth of cellphone usage related to contemporary long-distance households and livelihoods. Women bound to marital homesteads far from their birthplace praise the freedom to communicate with family across the country; a housewife uses scarce resources to send ‘greetings’ needed to ensure peace of mind. Women link with community groups and distant menfolk, spanning rural/urban spaces to manage their increasingly busy and insecure lives. Older women blend these new technologies into traditional agrarian livelihoods and community activities; younger women are eager to navigate into the 21st century and away from farms. For cash-strapped rural housewives, their frugal, ingenious, yet constrained uses of “mobile” (stationary) cellphones help them achieve many freedoms. Findings from this village census of cellphones add to a growing body of more nuanced research on the social shaping of cellphones and their uses for human development. Research reveals the intersections of adaptive uses with contemporary gendered patterns of poverty, inequality, and deagrarianization. They serve simultaneously as potentially transformative and emancipatory as well as divisive forces in sub-Saharan Africa.

Keywords: mobile phones, gender, Africa, technology, adoption, usage, rural livelihoods, development as freedom

### **I. Introduction**

The mobile phone is a remarkable new technology for rural Africa, spreading where conventional telephone landlines are nonexistent, talking face-to-face is the preferred communication channel, and electricity scarce. Mobile phones have become nearly universal in recent years, leapfrogging over the lack of conventional landline telephones in rural areas of developing countries. In Sub-Saharan Africa, in particular, the rapid pace of adoption has garnered particular attention (Souter et al, 2005; Meso, Musa, & Mbarika, 2005; James & Versteeg, 2007; Carmody, 2009). The ‘early adopters’ (Rogers, 2003) have been the urban elite and entrepreneurs, while the pre-paid model of cellular access and low denominations of airtime have helped mobile phones spread to low-income people. Researchers looking beyond adoption reveal adaptive uses in rural off-grid situations and among low-income people, including women. Lacking not only landlines but also constrained in terms of economics and infrastructure, users have developed ingenious adaptive usage patterns, ‘flashing’ recipients, sharing handsets, and other ways of ‘using without spending’ (as in Burkina Faso: Hahn & Kibora, 2008). Such creative adaptations perhaps started with small businesspeople, whether in urban Rwanda (Donner 2006b) or Nigeria (Jagun, Heeks & Whalley, 2008). These users are new actors in complex socio-technical systems (i.e., Beijer et al, 1987) helping to shape the very technology they use (Oudshoorn & Pinch, 2007). Rural uptake is not separate from urban usage, but is evidently intrinsically linked to urban adopters through long-distance households (Skuse & Cousins, 2007); this significant finding is backed by this study of users in one Kenyan village.

Class, race and sex also interact to shape adoption, attitudes, and significance of technological innovations (Wajcman, 1991, 2004): mobile phone adoption and benefits are similarly not expected to be gender neutral. The capacity of women users to produce new, advantageous readings of artefacts is dependent on their broader economic and social circumstances (Wajcman, 2007, p. 294). Ling (2004), looking at Norwegian youth, finds mobile use to mirror broader gendered patterns of traditional telephony; while in Israel, gender roles shape how Israelis perceive the role of mobile phones in their lives (Lemish & Cohen, 2005). In India, gendered perceptions of modesty conflict with phone ownership and influences sharing (Stenson & Donner, 2009). Green and Singleton (2007) find gender influences perceptions of ‘mobile talk’ in the Pakistani-British community, devaluing women’s conversation as ‘gossip’. Research into the gendered dimensions of mobile phone use in the developing world, especially in rural Africa, is beginning to reveal a similarly complex, nuanced picture of access, usage patterns and impacts on populations across the digital divide. Some of the limited research so far reveals market women in southern Nigeria using cellphones to aid their business (Jagun et al, 2007). The literature also reveals a complex and gendered disparity in access. Examining seventeen African countries, Gillwald et al. (2010) finds that in thirteen countries, more men than women own phones and, of those who own phone, men spend more on average than women. Abraham (2008) documents two class of women phone owners; those with airtime and ‘underprivileged users’ who are voiceless. Comfort and Dada (2008) argues that ICT has a social status that tends to emphasis existing gender inequalities. Wakunuma (2007) finds that mobile phones aggravate existing gender inequality in Zambia. Comfort and Dada (2008) report that Nigerian women find mobile phones a ‘mixed blessing’, bringing a sense of control but at a price. Scott et al. (2004) find women in Uganda have less access to mobile phones than men but the reverse in Ghana. Recently Burrell (2010) finds systematic exclusion of women moving outside of their personal networks in Uganda.

Given the extent and pace of cellphone diffusion combined with the paucity of rich empirical research, many questions remain about the gendered nature and consequences of mobile adoption and use in rural Africa, the latest frontier of cellular communications. What forms of cellphone access are emerging at this geographic, economic, electrical, and telecommunications frontier? How do these access and usage patterns differ for men and women? How do rural women –noted for limited mobility and access to cash-- value cellphones in their lives? Many practical problems can be expected to arise related to use of delicate digital devices in low-income, off-grid settings: how does this fragility and complexity shape usage and the significance of phones for rural women? We address these dimensions of usage in the context of African women’s contemporary lives and livelihoods through a detailed case study.

We envision cellphones as multi-purpose communication devices that can have a range of real development benefits not captured in economic functions and indicators alone but which are reflected in the human development paradigm, which sees development as freedom (Sen 1999) or the expansion of capabilities “to do more and be more” in ways that people have reason to value (UNDP,1990; UNDP, 2001). Mainstream development discourses around cellphones in the developing world still tend to emphasize economic potential of mobile phones in the hands of traditional pastoralists, fishermen, farmers and traders (see Aker & Mbiti, 2010). A host of enthusiastic technology-centered applications are emerging, such as the Kenya Agricultural

Commodity Exchange (KACE) aiming to reach farmers with text messages with current commodity prices (nextbillion.net, 2009). or Text for Change in Uganda which sends interactive text messages hoping to prevent the spread of HIV/AIDS (CIN, 2009); these may be useful to some, but are certainly insufficient and narrowly technocentric in their framing. Significantly, this study from rural Kenya enhances our understanding of how ordinary Africans appreciate mobile phones as communication devices that support a range of inter-dependent valued freedoms, blending non-economic, social and personal domains. This pattern is observed among poor populations in a few settings in Africa (Donner, 2006a; Molony, 2006; Souter et al, 2005), and Jamaica (Horst & Miller, 2006). Little attention, however, has been paid to the gendered aspects of these freedoms and how these are expressed by women in rural, agricultural, off-grid households. This article thus addresses these research gaps at the intersection of development, gender and the social shaping of technologies in contemporary rural Africa.

## **II. Mobile Phones Arrive in Rural Bukusu-Land**

### **The Study Site and Data**

Cellphone masts now dot the horizon of the rural study site in Bungoma District in Western Kenya (see Figure 1 for map of study site location in Kenya and village) first settled in the late 18<sup>th</sup> century by cattle-rearing Bukusu clans. Men used to manage large herds of cattle while women tended their kitchen gardens. Now, cattle are few, people numerous, and handsets a transformative technology. By 2007, the population had reached 5,200 in 848 households. In 2005, informants tallied six handsets, but by 2007, the study survey counted 205 handsets in 125 households. This rapid rise mirrors adoption rates elsewhere. Village ownership is low: 15% of households or 7% of the population (see Table 1) relative to the national rate of about 30% in Kenya (ITU, 2009) or South Africa, where, Skuse and Cousins (2007) found almost a third of residences owning a cellphone.

[Insert Figure 1 study site location and village map, here]

The study benefits from unique data from a village census undertaken in a rural community in Bungoma, beginning in 2005 as part of a larger case study of technology change<sup>(1)</sup>. In early 2007, the survey team visited all households in the 15 square kilometer study site, reaching 848 of 878 households (a 97% response rate for the village, providing a census).. A questionnaire gathered data on household<sup>(2)</sup> composition, livelihood activities, land, crops, and assets. For phone-owning household (N=125), the 'primary phone-owner' was asked about handsets, recent calls, airtime, charging, benefits, and problems. For non-phone-owning households (N=720), an adult was asked about 'ever use' of mobile phones, benefits, and problems. Qualitative methods complemented the village survey. In particular, in-depth individual interviews were conducted with 16 phone-owners: 12 women and 4 men aged 18-66. They range from novice users to long-term phone-owners and are involved in different activities, including household and farm work (many women), local trading in crops and livestock, and other non-farm and white-collar jobs. Two are recent (unemployed) high-school graduates; several are experienced community group leaders, involved in HIV/AIDS and other issues. Other methods, including participant observation and group discussions, provide the source of additional insights<sup>(3)</sup>.

## Cellphone adoption and diffusion in a village

The mobile phone is the most complex device in the village where the hand hoe is the most common tool: only half of households own a radio. Small farm parcels of 1 to 3 acres are getting smaller through inheritance and in-migration, commercial fertilizer is expensive (about the price of a new Nokia handset), soil fertility and crop yields are declining and an annual hungry season plagues the poorest households. Chronic poverty is further aggravated by HIV/AIDS. Rain-fed hybrid maize, beans, vegetables, cash crops, various artisanal, and non-farm activities sustain households. Despite the distance to Nairobi (about 9 hours by bus) and relative poverty—Bungoma district is among the nation's poorest—the first handset was acquired as early as 1999 by one early adopter, an in-migrant to the village in 1991, well-educated, and relatively affluent. In 1999, he could not use the phone in the study village, since mobile phone service did not yet exist in this region. Lack of network was a significant barrier to ownership. Celtel (now Zain) and Safaricom-- the two leading service providers in Kenya, had expanded to serve most populated areas of the country by 2006. As in much of the developing world, prepaid service is universal in Bungoma District. By early 2007, the cheapest handsets cost about Ksh 2100 or US\$30. Airtime was running Ksh 70 (US\$1) for a 3 minute call, high in relation to wages (Ksh 200/day for casual work) or a sack of fertilizer (Ksh 2000).

In this village, access to a mobile phone is often synonymous with ownership of a handset, which has been associated with greater wealth, education and involvement in non-farm work. Phone-owning households have larger farms, more cattle, ox-ploughs, and bicycles (in Table 1); heads of phone-owning households more often have secondary or even college education. While ownership levels are low, desire to own a mobile phone is high, inhibited mostly by cost: among the 85% of households that did not own a cellphone, most would be likely to buy if prices come down further. (Anecdotal evidence from the site reveals many more households do in fact own handsets by 2010, but they are not universal. A small survey in rural Siaya revealed 40% of a sample of households did not have a handset)<sup>(3)</sup>.

[Insert Table 1 here]

Ownership is gendered: male heads own 58% of handsets in 125 households owning any in 2007. These early adopters have used phones for two years on average (in Table 2), signifying the generally recent arrival of cellphones in rural Kenya. Additional owners are often from the same 'early adopter' household: the male head passes (used) phones on to wives and grown children. Sons and daughters living in their parents' rural household account for 24% of the handsets recorded in household rosters, and wives another 16%. Female-headed households are rare: only 6% of women owners are single, separated or widowed women. Men buy their own handset, while women receive phones as gifts (24% of women versus 5% of men). Not only are most handsets owned by men, but 40% of women (vs 5% of men) phone owners have a handset that does not currently work—they lack resources to repair it. For women without a handset, borrowing from 'friend or family' who shares their handset is the most common way to gain access to a phone (85% of cases). Effective access to phones varies by gender and generation of both the owner and the borrower. These reflect household hierarchies and rural social norms.

An important driver of adoption is having non-farm work, which is much more common among male phone-owners: 61% of heads ‘regularly work away’ versus 23% of non-owning households (in Table 1). Furthermore, among 33 wives with a phone, 79% have a husband who is ‘regularly working away’. In this decades-old pattern of household organization, the male head of household has a home in the village where he was born and where his wife raises their children; he works for income in Nairobi, Mombasa (the second largest city), or other towns (in factories, shops, government) often establishing another residence. Indeed, male heads in the study village work as veterinarians, pharmacists, accountants, livestock traders, managers, and security guards, for example.

[Insert Table 2 here]

Having multiple residences often mean the man has another family, too. Polygyny persists in this patriarchal Bukusu culture, as elsewhere in Africa, while women are expected to marry. Marriage provides access to land and livelihood security. Women furthermore move into the village, a common virilocal pattern of matrimony. Native-born girls tend to leave for marriage and increasingly for school. Not surprising, the majority (73%) of women who own a phone report ‘regularly working here’, i.e., managing the family and farm. A minority of women (especially those with higher education) ‘regularly work away’ as teachers and shopkeepers nearby. Among youth, the gender gap in work is larger: 53% of male phone-owners under age 30 report having ‘work away’, compared to 19% of women phone-owners under age 30. Younger women tend to have young children and consequently less mobility.

## **II. Gendered Geographies of Phone Usage**

Multi-residential households are shaped by urban work, rural homesteads, virilocal marriage patterns, and schoolkids in boarding schools. These lead to spouses separated for months at a time and children unavailable to help at home with farm and child care. Managing these households is an intricate process over large distances. Phones clearly help spouses coordinate farm, household and community activities. One informant, Carolyn (aged 29) bought her phone ‘because my husband stays [lives] away from here’ much of the time. Reginalda (47) is one farm-bound housewife whose husband lives away, who shares that ‘sometimes you may call your husband to bring you what you are lacking.’ Mobile phones are valuable to these low-income, stretched long-distance families in Kenya just as in South Africa (Skuse & Cousins, 2008; Skuse & Cousins, 2007), metropolitan Ghana (Burrell and Anderson 2008), and urban Jamaica (Horst & Miller, 2006). Thus it is not the transportable, mobile quality of ‘mobile phones’ that rural women most praise but their ‘apparatus’ (Campbell, 2007; Katz & Aakus, 2002) as telecommunications tools where there were none.

Furthermore, the relative meaning of distance, the location of calls and patterns of usage reflect differential mobility related to marital patterns, women’s roles in households and community

groups, and the practical constraints women face (even more than men) living in off-grid villages lacking electricity. For example, there is no electricity or landline in the village; a 30 minute walk leads to small towns on the main highway, offering phone-charging, and local transport. Another hour and US\$.50 by bus fare leads to Bungoma, the district capital, which boasts large shops, banks, government offices, landlines, and inter-city buses.

We see that women based in the village call their birth families and members of multi-residential households across the country; they also call local yet inconveniently 'far' group members just across the village line. Men call their local birth family, and more distant friends and workmates who move around the country. Long-distance relationships shaped by marriage, work, and mobility are reflected in the large percentage of long-distance' calls in a village (in Table 3), and the gendered patterns that emerge: 88% of women under age 30 report making regular long-distance 'personal' calls (vs. 58% of men) with women call their own siblings more often than their own husbands. In contrast, women's 'community' group calls (to other self-help and church congregation members) are normally made across relatively short but inconvenient distances near their home, to help facilitate activities: explains Pamela: 'In our merry-go-round groups... If I'm not able to attend [a meeting] I call my friends to tell them!' More men make long-distance calls for 'work', and their community calls reach not local self-help groups running village life, but pastors, church leaders, and government officials, farther away. These calling patterns reflect women's social networks related to marriage, family, and community group; while men's networks reflect more actual travel for work, family and leadership in formal social affairs.

[Insert Table 3 here]

Survey respondents were asked to list calls 'normally made' recently by type of call and to whom. 'Personal' greetings are the most common of all; although men make more work calls than women (70% of men versus 38% of women regularly make 'business/work' calls). During popular 'personal' calls, traditional oral Bukusu greetings to 'stay in touch' merged with practical requests to send seeds, as well as help to prepare land and make arrangements to pay children's school fees. Such farm tasks and childcare arrangements often fall to women homemakers. For these 'personal' calls, important networks for women are their birth family: 70% of women normally call siblings or other relatives, twice the rate for men (36%). This pattern is related to the custom of virilocal marriages, in which women move into the village of their husband and the woman's parents, sisters and brothers are relatively far, usually outside the village and sometimes the district. Women are more selective in their networks. They have fewer contacts (a median of 20) than men (50 on average). Gender impacts both the size of the network, as well as the underlying intent of the connection.

Men more frequently identified 'friends' among the top two 'personal' (22%) with wives less common (16%), since local men reside near their birth family. Men and women alike call sons and daughters, who with schooling, search for work and marriage, leave the village. Having a phone allows new migrants to the village to call out to family and friends left behind: in-migration is indeed associated with phone ownership, as 45% of phone-owners arrived within the last 10 years (Table 1).

Phones help busy rural women leaders run these local, voluntary support groups more efficiently with less frustration. Thus ‘Community’ calls are common—42% of women and 44% of men report normally calling someone about local group and church matters, and 35% of men normally call a pastor or other church member. Women traditionally belong to local self-help organizations (widow support groups, savings clubs, HIV/AIDS support and orphan care groups). Mobile phones help them run these local activities, ranging from income-generation to care for AIDS orphans. Women call fellow group members, making up a third of women’s normal ‘community’ calls. These groups provide local forms of support, help make up for poor government services, and occasionally bring extra income. Jane (44) is a HIV+ single mother of three young children, landless after a divorce, who earns a little cash with public HIV/AIDS events:

‘I wanted to have a phone so that it may facilitate my activities, especially educating people in public bazaars. Groups in the village have meetings... I wanted to have a phone to be receiving such information to attend. As a “PLWHA” [person living with HIV/AIDS] who has gone public, I like educating people about it.’

For women in particular, the potential mobility of the mobile is less important than its quality as a means to quickly connect across inconvenient distances. ‘Convenience’ resulting from a well-timed call also relieves the angst of not knowing and being left out. Conversely, phones most ‘disappoint’ not by their interruptions into the flow of life, but when they do not function as they are supposed to, namely, to make a call. The telephone in 1930s rural America was quickly adopted by isolated farm wives to stay in touch rather than to boost rural economies (Fischer, 1994); similarly mobile phones are not themselves mobile, but help rather isolated rural Kenyan women reach family, friends, and spouses for varied purposes.

In Kenya today, cell phones allow women to connect to social networks otherwise constrained by geography. Voice calls, more popular than text messaging, in Kenya as in Tanzania (Molony, 2006) and other sites links ‘known and trusted’ contacts for personal, social, and economic concerns. While more expensive, voice calls accommodate better to multiple languages and the urgent nature of communications across large distances with sometimes novice women owners on old handsets. The preferred mode of oral communication upholds pre-existing social networks, as found in Burkina Faso (Hahn & Kibora, 2008) and Nigeria (Comfort & Dada, 2008).

Phones help women organize farms and family life, run community groups and deal with emergencies. ‘My life is easier’ says Grace (44), reflecting on saving time, travel and the convenience of phones. Asked ‘Would you ever give up your phone?’ Carol, young and still a novice phone-owner, protests ‘No! I will be in darkness!’

### **III. Do Phones Mean Freedom? Yes, at a price**

As this young woman’s quote suggest, mobile phones might not directly address poverty-- since wealth and urban ties drive ownership and phones consume cash. For women in particular, cell phone operating costs pose difficulties. Women cellphone users spend less than men: women spend a median of KSH 320/month (US\$4.50) to men’s average KSH 560/month on airtime.

The human development paradigm (UNDP, 1990; UNDP, 2001) offers a useful normative framework that captures how and why rural women ‘spend’ limited financial and social capital on phones to talk to family and friends. Phone users seek to enhance various inter-related freedoms that matter to them. This takes the form of interactive (voice) and long-distance communication with friends and family, rather than the pursuit of profit. While they are personal –handsets have individual owners-- the devices are also communal and shared, so that handsets help maintain social networks of family, the marital household, local groups, including support groups, self-help organizations, and church mates.

Calls clearly ‘save time’, ‘replace travel’ and are ‘convenient’ (the most common benefits reported by survey respondents). Grace, a co-wife whose husband lives and works away, originates from another district altogether. ‘Traveling to Maragoli all the time, transport will be expensive,’ she explains. ‘I have this [mobile phone] and I want to know something, I call and ask. Notices of illness, deaths, funerals and gatherings are common content passed via wireless ‘greetings’ to distant relatives. ‘Whenever they have a problem, they call without me going there.’ Pamela explains, ‘when any of my animals fall sick/ill, I use my phone to call up a veterinary officer...these people are not easily found at their homes.’ These topics figure into women’s conversations in particular. ‘Without a phone’ recalls Rose ‘you may not get to know about your relative who died until after death and burial. But with [mobile] communication is so easy, [as] people may not have money to spend on transport.’ Women, even more than men, appreciate phones to help deal with insecurities: 72% of younger women value phones for ‘safety or emergency’ for example, in contrast to 35% of younger men. ‘There was a time’ says young mother Pamela ‘when it really helped me. I was sick and my husband was away in another household. I managed to ask my child to get me my phone... Had it not been for my phone, I would have died.’ Janet (42) recalls ‘There was a time where there were massacres...Bandits could just come and start slashing villagers! I used my phone, although it did not have much money. I called my husband to call me...’

Individual, universal aspirations--to be alive, have adequate food, to be free from drudgery, safe from fear and danger, to affiliate with others –are reflected in these statements by informants. These complex motivations drive economic and social pursuits that vary by gender, age as well as by time and place; these are shaped by developmental actions of international agencies, government and firms and now by this new communications device. In contrast, discussions around the relevance of mobile phones for development in Africa and other resource-poor settings are often discussed in terms of their potential for economic growth (Waverman, Meschi & Fuss, 2005), facilitating market transactions (Overå, 2006; Jensen, 2007), development projects (Schackleton, 2007), communication of health messages, and other applications aiming to address technical barriers to poverty. These development aspirations reflect narrow technological visions that ignore complex rural realities and long-term gendered dynamics of technology usage in the hands of rural African men and women today.

Unequal access to cellphones is reflected in not just ownership of a phone or SIM card, but the patterns of diffusion within the village through households, the variations in intensity of use and the different size of networks of men and women. This is compounded by the differential burden of technical and economic constraints to more effective and intensive usage: namely, women’s

lack of ready cash and mobility. Non-owning men, for example, are more likely than women to have used a phone at all: 57% of male respondents in non-owning households reported having ‘ever used’ a mobile phone, versus 40% of women. For many women, simply charging batteries is the major obstacle in using phones<sup>(3)</sup>. Aside from the costs of charging in commercial kiosks in nearby market towns (about US\$.30 per charge), the trip itself is inconvenient and an obstacle for mothers. Phone-charging is a particular problem for rural housewives, who often lack access of electricity and mobility. 72% of young, 65% of older women and 60% of young men mention phone charging problems. Stella pleads for a ‘battery that sustains the charge for a longer time’. Mary recalls, ‘I was involved in that accident; [my phone] had run out of battery and airtime I just kept it for several days.’ Gendered rural economies shape the intensity of phone-use, not just ownership. Access varies by gender and generation of both the owner and the borrower. As Janet (42) explains, ‘My other co-wife can borrow my phone to put her own line in [i.e., her own SIM card]’ but for others, ‘I usually tell them to buy a scratch card...’

Lacking cash, women opt to receive calls only (at no charge) or receive airtime via ‘Sambaza’<sup>(6)</sup> airtime service. ‘If I want to talk with a person, I can ‘flash’ that person’ explains Rose (44). Farmbound housewives thus rely on receiving airtime: more (64%) older women ‘receive’ ‘Sambaza’ than send it (39). These rural women have even lower phone usage than in urban areas: in peri-urban South Africa, women make 68% of all phone calls, compared to 50% made by men (Skuse & Cousins 2007). Older women (over 30) are much less likely to ‘send’ airtime, use calculators, or play games, thus conserving expensive battery charge.

Reports of ingenious innovations of rural African cellphone users and the boom in small entrepreneurs providing repairs and charging services fill popular media and development rhetoric; but these are real constraints that shape communications. Phone use privileges the better-off rural elite with education and non-farm jobs. Prior socio-economic differentiation, pre-existing social networks, household groups, and larger structural problems intersect to affect the rural poor—and women in particular.

Such differential access might ultimately aggravate rural inequalities, rather than lift the poorest—often elderly women—out of their poverty. Donner (2008) suggests that in this situation, mobile phones might ‘amplify’ inequalities rather than radically transform social structures. Cellphones are at once transformative, truly leapfrogging distance and lack of regular telecommunications infrastructure to enhance a range of valued freedoms; at the same time, they are nothing new, aggravating and adding to gendered wealth differentials.

#### **IV. Conclusion**

Drawing from a unique census of cellphone ownership (and non-ownership) in a Kenyan village, combined with in-depth interviews with phone-owners, this article draws out dimensions of gendered access to cellphones for rural users facing many barriers (lacking electricity) and cobbling together a living spanning agrarian roots and urban values. Usage both supports and is financed by urban incomes, rural-rural mobility, and rural women’s triple roles. The significance of cellphones to rural women cannot be disengaged from off-grid disconnected rural lives that were already linked through social networks and remittances.

These findings reveal the contemporary aspirations and busy reality of low-income rural African women living at the global frontier of new media. Guided by theoretical insights from the social shaping of technology, enriched by the inclusion of gender as an analytical category of technology adoption and assessing the situation through the human development lenses; we can observe these new rural users eagerly engaging with modern world, actively taking part in the co-evolution of emergent cellphone technologies (such as Sambaza for remittances) and urban/rural livelihoods. New communications technologies intersect with gendered, geographically and historically informed rural livelihoods. Across sub-Saharan Africa, long-term processes of rural deagrarianization (Bryceson, 2000) lead to the increasing reliance of rural-based, nominally agricultural communities on urban, non-farm income and identity. No strict urban/rural divide is visible, but one structured by differences in outlook and geographic mobility spanning agrarian and town landscapes and 'action spaces' (Manvell, 2006). Cellphones enter these action spaces through real people: an appreciation for the gendered nature of livelihoods and mobility thus enriches our understanding of technology penetration and use into farm-based households.

The basic 'apparatus' of mobile phones as a simple telephone is revealed through management of long-distance relationships, especially for women who have left loved ones upon marriage, and seen children move away. For most rural people, men and women alike, mobile phones are simply, yet significantly, convenient telephones. To a busy, anxious, middle-aged rural housewife, a handset borrowed from a neighbor helps bring home seeds and feel connected, while sending apparently 'greetings' to a distant sibling. To more educated young women, these new 'small devices' inspire dreams of escape from difficult rural life in 21<sup>st</sup> century Kenya.

## Endnotes

1. Funding was provided from the National Science Foundation for ‘Hybrid Technologies in the Era of HIV and AIDS: The Hoe and the Mobile Phone in Rural Africa. Award number SES-0621013 and the John D. and Catherine T. MacArthur Foundation. The Tulane University Institutional Review Board (IRB) approved the research protocols. Interviews were conducted in Bukusu or Swahili; translations were undertaken by trained Kenyan research assistants. Research authorization came from the Kenyan Ministry of Education, Science and Technology (MOEST).

2. For the purposes of the survey, the definition of a household follows Kenyan survey protocols as a family grouping that ‘eats from the same pot’. The household is a geographic unit, and sometimes entails several residences for purposes of work and schooling, thus the ‘multi-residential household’. The family refers to the larger clan, extended family of birth family, as well as through marriage, extending an individual’s primary social networks across space. For the study, all ‘households’ within the catchment area were listed with the help of local guides. These numbered 878. Polygynous heads of household in the survey catchment area number 36 men with 1-4 wives associated with 78 different women in the study site, and others outside the survey catchment. Pretests confirmed that handsets have a ‘primary’ individual owner. He or she was sought out for a second interview, sometimes involving three return visits and a few phone-interviews.

3. Other methods used included a participatory village map, sketched in 2005 for prior fieldwork, and updated in 2007. Interviews were conducted with village elders around demographic, agricultural, and environmental changes and with home-based-care workers around HIV/AIDS and key informants about health and development status and projects. A market survey documented commercial battery-charging kiosks and phone services in nearby towns. Participant observation provided experiences with handsets, SIM cards, battery charging, signals, and M-Pesa (an innovative new money-transfer service) in early 2007. A follow-up phone survey in 2008 reached the same household in only 44% of cases, indicating problems in keeping phone batteries charged and SIM cards active. Return visits to the study site in 2008 and 2009 suggest that handsets are diffusing more widely within the village following patterns of penetration across the continent. In the absence of a follow-up census of the site, no statistics can be offered. Follow-up fieldwork now focuses on solutions (relating to hand-crank and solar) to the demand for phone-charging in the village.

4. The category of mobile phone ‘ever use’ households is a sub-sample of households which do not own a mobile phone but who reported having ever used a mobile phone.

5. Based on interviews with 125 men and women in households who reported owning at least one handset per household. Most respondents are the primary owner of the handset. As well, the household roster lists members of households with phones, not all of whom were interviewed in-

depth. The category of young people includes both men and women  $\leq 30$ , a sub-sample of the 125 phone-owners.

6. 'Sambaza' is a Safaricom service that allows the subscriber to send airtime ('top-up') another Safaricom subscriber long-distance via text message. Celtel (now Zain) has a similar service now.

7. Respondents (n=125) were asked about recent calls (or texts) made to up to two people they "normally call" for categories of 'personal', 'work/business', 'community', 'media' (i.e., radio, TV), and 'others', and to whom, where that person is located, and for what purpose. Calls to destinations outside Bungoma District are considered long-distance. Phone charges are the same as for other mobile phone calls. Callers could mention several calls per category; this analysis considers the case of individual callers rather than total calls made.

8. Most older women place calls to Nairobi (15 women), replacing a bus trip, as well as other distant locations such as Samburu (in the north), Mombasa (coast), and closer Rift Valley Province towns of Eldoret, Naivasha, GilGil, and Kitale. People were identified as: "husband" (7 cases), "brother" or "sister" (7) "son" or "daughter" (6) and others by name, extended family or "friends". Older men made personal long-distance calls to "sons and "friends" in Nairobi (14), Rift Valley towns, Kisumu (western Kenya), and Mombasa (3).

9. Younger women called outside to husband (and fiancé) (8), brother/sister (11 women), "parent"/father (5), friends (5). Many calls were to Nairobi (10 women), major Rift Valley towns (Naivasha, GilGil, Kitale, Eldoret, Kajiado) (10 women), plus Mombasa (1), Meru (1) and Uganda (1). Younger men called long-distance to brothers/sisters, friends in Nairobi (6), Naivasha, Kitale, Kajiado, Uganda (3).

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**Table 1. Characteristics of Phone-Owning and Non-Owning Households**

<b>Characteristic</b>	<b>Mobile-Phone Owner (N=125)</b>	<b>'Ever Used' Mobile-Phone (N=326)<sup>(4)</sup></b>	<b>Never Used Mobile Phone (n= 391)</b>
<b>Household Head</b>			
Head's age (median)	35 (17-72)	39 (20-90)	44 (20-88)
In-migrant to study site (last 10 years)	45%	11%	26%
Median Household Size	7 (2-17 people)	5 (1-14 people)	5 (1-15 people)
Head of Household has "other residence"	40%	13%	11%
Education: Head of Household has at least 'complete primary'	69%	55%	53%
Head "regularly works away"	61%	22%	23%
<b>Wealth and Productive Assets</b>			
Median Area owned, rented in acres (range)	3 (1/2 – 33)	2 (0-35)	1.75 (0-53.5)
Have 3 or more Cattle	43%	21%	25%
Ox-Plough	40%	20%	14%
Radio "working"	58%	42%	34%
Bicycle	72%	53%	48%

Source: Original Field Data, 2007 (household survey)

**Table 2. Characteristics of Individual Mobile Phone Owners by Age and Gender<sup>(5)</sup>**

	<b>Youth (<math>\leq 30</math> Years) n=44</b>	<b>Women n=48</b>	<b>Men n=77</b>
<b>Individual Characteristic</b>			
Age (median, range) in years	25 (16-30)	29 (18-65)	36 (16-65)
Secondary or higher education (%)	51	64	55
Relationship to head of household (%)	Male Head: 24%	Female Head: 6%	Male head: 87%
	Spouse: 44%	Spouse: 83%	Sons: 10%
	Offspring: 51%	Daughters: 10%	Other: 3%
In-migrant to village, past 10 yrs (%)	25%	47%	21%

Regularly work away (%)	53% (young men) 19% (young women)	27%	61%
<b>Phone Functions &amp; Usage</b>			
Owns 'working' handset (%)	60	60	96
Acquired handset as "gift" (%)	--	24	5
Number of contacts (median, range)	27 (1-230)	20 (1-230)	50 (10-480)
Months used phone (median, range)	24 (1-96)	14 (1-72)	24 (1-144)
Voice calls (% Send/% Receive)	96/100	98/99	99/100
Texts (% Send/% Receive)	80/91	82/82	77/91
Flash (% Send/% Receive)	89/87	91/89	86/88
<b>Spending and Battery Charging</b>			
Median airtime per month (Ksh)	500 (5-6080)	320 (0 – 4000)	560 (100-6080)
Buy scratch cards 2-3 times/week (%)	33	39	38
Buy Ksh 40/50 scratch card (%)	61	68	59

Source: Original 2007 field data (household survey)

Table 3. Calls Made Outside the District, by Gender, Generation, and Type of Call <sup>(7)</sup>

Type of call	Number Making This Type of Call	% of calls made 'long-distance'			
		Women <sup>(8) (9)</sup> n=48		Men n=77	
		Younger (<=30) n=25	Older (>30) n=23	Younger (<=30) n=20	Older (>30) n=55
<b>Personal</b>	<b>123</b>	88% (22 of 25)	78% (18 of 23)	60% (12 of 20)	56% (31 of 55)
<b>Work</b>	<b>72</b>	29% (4 of 14)	38% (3 of 8)	14% (2 of 14)	38% (14 of 33)
<b>Community</b>	<b>38</b>	10% (1 of 10)	none (of 10)	33% (3 of 9)	7% (2 of 27)
<b>Media</b>	<b>20</b>	100% (5 of 5)	100% (of 1)	25% (of 4)	100% (10 of 10)
<i>% calls made long distance</i>		<b>66% (42/64)</b>	<b>64% (27/42)</b>	<b>43% (20/47)</b>	<b>44% (84/129)</b>