"I need my own mobile phone": Use of mobile phones and payphones in Ghana

Araba Sey

Annenberg School for Communication, University of Southern California, Los Angeles, CA

sey@usc.edu

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Abstract

With each new ICT emerging in the developed world, new hope arises as to how it can transform the fortunes of the poor in developing countries. Currently, with their small size, relative ease of deployment, relative low cost and easy usability, mobile phones have become the latest champions of poverty reduction. This research project investigated uses of mobile phones by subscribers in Ghana, and concludes that the link between ICTs and poverty reduction can be found in how poor people use communication technologies to connect to those resources they consider useful in their daily activities. Mobile phones play an important role in helping people gain some level of economic and social sustainability in their livelihoods, this role being largely that of connectivity and accessibility to others, which provides users with a sense of well being, the ability to take advantage of opportunities when they arise, and a lifeline to help in times of special need. On the other hand, direct use of the mobile phone for income generation, such as providing payphone services, is a tenuous proposition for poor people because as micro-entrepreneurs they are vulnerable to shocks from changes taking place in the volatile ICT industry.

Introduction: ICTs and Poverty Reduction

Despite the close linking of information and communication technologies with socio-economic development in general and poverty reduction in particular, the basis for this association remains unclear. Projects continue to reveal much about the potential of ICTs to improve poor people's lives, but little about how this potential can be translated into widespread reality. Examinations of the use of ICTs in poverty reduction programs (generally referred to as ICT for Development – ICT4D) have recorded a range of benefits that can accrue to users of these technologies – e.g., income generation, savings in

money and time through reduced need for traveling, access to market information, access to government services, access to educational resources and health care, improved flow of remittances, political and gender empowerment (e.g., Saunders, Warford, and Wellenius, 1994; Cechinni & Scott, 2003). In general it can be said that the perceived potential benefits of ICT use for the poor are in the areas of improved productivity and social equity.[1] However, these benefits do not accrue automatically; they are contingent on factors operating within the environment. Attempts to take these factors into consideration include using socio-technical or community informatics approaches to analyze the impacts of ICTs (e.g., Slater, & Tacchi, 2004; Warschauer, 2003), generally problematising the issue of access (e.g., Alzouma, 2005; Wade, 2004; Warschauer, 2002), and more recently, applying the sustainable livelihoods approach, which has its roots in the development community.[2]

Within the broad framework of sustainable livelihoods, this study examined how people in Ghana use mobile phones in the course of their daily lives, with a view to understanding the role of mobile telephony in improving lives or livelihoods. This report highlights some of the noteworthy findings relating to the development of micro-entrepreneurial mobile payphone operators and modes of usage of their services. This report is presented in five sections: Section One describes the research methodology, and research samples. Section Two briefly discusses the emergence of the mobile payphone system and introduces two major dimensions of the mobile payphone's role in Ghana – addressing digital poverty and income poverty. Section Three presents data on primary trends in payphone use as a basis for demonstrating why mobile payphones are more useful as a means of facilitating communication (addressing digital poverty) than as a direct means of sustainable income generation for the poor (addressing income poverty). To illuminate the role of mobile telephony in addressing digital poverty, Section Four discusses the research findings on mobile phone use. Section Five discusses some implications of the research findings.

1.   Methodology

The methodology was largely qualitative, consisting of in-depth interviews, field observations, analysis of company records and non-representative surveys (Table 1). Interviews were conducted between June 2006 and January 2007 in urban, peri-urban, and rural locations in southern Ghana (Table 2). The surveys were administered in July and August 2007 in the Greater Accra region (Accra, Prampram), Ashanti region (Apemanim, Kumasi) and Upper West region (Wa, Ko). The goal of the surveys was to explore

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[1] See Donner (2006) for a concise summary.
[2] For discussions and critiques of the sustainable livelihoods approach, see Ashley & Carney (1999), Bebbington (1999), Chambers (1987), Chambers & Conway (1992), Cotula (2002), DFID (1999) Duncombe (2006) Farrington (2001), Farrington, Carney, Ashley & Turton (1999), IFAD (2001), and Toner (2003). And for studies applying this approach to ICTs see Arun, Heeks, & Morgan (2004), Batchelor, Norrish, Scott & Webb (2003), Chapman, Slaymaker & Young (2003), Duncombe (2006), Parkinson & Ramirez (2006).

interview findings on a more general basis. Field observations and document analyses took place throughout the length of the study period.

Table 1: Interviews and Surveys

Respondents	Interviews*	Surveys
Mobile phone network providers	4	-
Mobile phone retailers	5	-
Mobile payphone operators	15	96
Mobile phone subscribers and users	25	197

These represent the formal interviews only. Several informal interviews and casual conversations also provided data for the study.

Table 2: Summary of Research Site Characteristics

Characteristics	Apemanim	Prampram	Osu
Type of community	Rural	Peri-urban	Urban
Location 　District 　Region	Bosomtwe-Atwima-Kwanwoma Ashanti	Dangbe West district Greater Accra	Accra Metropolitan Area Greater Accra
Population	329	10.317	44,027
District population density	236	58	5530
Main economic activity	Agriculture (subsistence farming)	Agriculture (fishing and cash crop farming)	Commerce
Unemployment	11%	8.9%	13.2%
Regional poverty level*	27.7%	5.2%	5.2%
Mobile phone ownership**	Low	Medium	High
Number of mobile payphone operators	2	About 40	Over 50

Sources: Ghana Statistical Service (2005). 2000 Population & Housing Census of Ghana. Fieldwork.
* Proportion of population in that locality falling below the national poverty line (900,000 cedis per adult per year, National Census, 2000).
** Researcher's estimation on the basis of fieldwork.

Sampling

Interview Sample

One top management official from each of Ghana's four mobile phone network providers was interviewed, as well as two managers at different branches of a large mobile phone retail company, one independent mobile phone importer, and two micro-entrepreneurs selling mobile phones and accessories. Mobile payphone operator interviewees consisted of ten operators in Accra, three in Prampram, and two in Apemanim. Seventeen mobile phone subscribers and users were interviewed in Accra, four in Prampram and four in Apemanim. Interviewees were selected through personal contacts with local informants and the snowball method. Interviews usually involved multiple interactions with respondents, ranging in length from a few minutes to about two hours each time.

Survey Sample

Mobile Payphone Operators

Over 50% of respondents were from Accra, followed by Prampram and Wa. Although this was not a quota sample, the proportions reflect the concentration of payphone operators in urban and other areas with large populations. Males dominated the sample (about one-third), most respondents were young (75% were under 25 years), and most had Junior Secondary School (JSS) or Senior Secondary School (SSS) education[3].

Table 3: Survey Sample Characteristics – Mobile Payphone Operators

Location	Percentage (n = 96)	Gender	Percentage (n = 96)
Accra	67.7	Male	63.5
Prampram	20.8	Female	36.5
Wa	11.5	Total	100
Total	100		
Age		**Educational Level**	
18 – 20 years	36.5	No formal education	2.1
21 – 25 years	38.5	Primary	4.2
26 – 30 years	10.4	JSS	35.4
31 – 40 years	7.3	SSS	39.6
Over 40 years	4.2	Technical/Vocational	12
Missing	3.1	University	66.3
Total	100	Total	100

Mobile Phone Subscribers and Users

A greater proportion of the sample was from Accra and Kumasi (Table 2). This also reflects the larger population and higher number of subscribers in the two most densely populated districts in the country. Overall, there were more male subscribers (55.9%) and more female non-subscribers (53.2%). The sample was also relatively young – 78% of subscribers and 82.3% of non-subscribers were under 30 years. Subscribers had higher education levels – almost 60% had university education compared to just about 10% of non-subscribers, most of whom had JSS (31.6%) or SSS (32.9%) education. The sample covered a wide range of occupations (including white collar workers, village elders, students, farmers, fishermen, other self-employed entrepreneurs and some unemployed persons) but had a high percentage of students in both subscriber (21.1%) and non-subscriber (27.8%) categories. However, while students comprised the majority of subscribers, trading was the primary occupation of non-subscribers (32.9%). Respondents in the non-subscriber category generally earned less monthly income than the subscriber sample – 54.4% earned less than 500,000 cedis, while only 21.2% of the subscriber sample earned the same amount. Most subscribers earned between 1 million and 5 million cedis per month.

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[3] JSS and SSS education are equivalent to about 9 and 12 years of basic education respectively.

Table 4: Survey Sample Characteristics – Mobile Phone Subscribers and Users

Area	Percentage	Percentage	Age	Percentage	Percentage
	Subscribers (n = 118)	Non-subscribers (n = 79)		Subscribers (n = 118)	Non-subscribers (n = 79)
Urban	79.7	70.9	16 - 20 yrs	11.9	40.5
Rural	20.3	29.1	21 - 30 yrs	66.1	41.8
Total	100	100	31 - 35 yrs	10.1	7.6
Gender			>40 yrs	6.7	7.6
Male	55.9	46.8	Missing	5.1	2.5
Female	43.8	53.2	Total	100.0	100.0
Missing	0.8	1.3			
Total	100.0	100.0			
Monthly Income			**Highest Educational Level**		
< 500,000 cedis	21.2	54.4	No formal education	-	5.1
500,000 – 1m cedis	17.8	17.7	Primary school	0.8	10.1
1m – 2m cedis	22.0	10.1	JSS	2.5	31.6
2m – 5m cedis	15.3	5.1	SSS	22.9	32.9
5m – 10m cedis	9.3	1.3	Technical/Vocational school	11.9	8.9
10m – 20m cedis	0.8	-	College/University	59.3	10.1
> 20m cedis	1.7	1.3	Missing	2.5	1.3
Missing	11.9	10.1	Total	100.0	100.0
Total	100.0	100.0			

Percentages may not add up to 100 because of rounding.

2. The Emergence of Mobile Payphones in the Ghanaian Telecommunications Industry

There are currently five different types of payphone in Ghana, run on different networks (two fixed and three mobile). Ghana Telecom[4] and Westel payphones are installed and managed by the national fixed line network providers; Space-to Space runs on the Spacefon[5] network and is managed mainly by micro-entrepreneurs, One4All runs on the Onetouch network and is also managed mainly by micro-entrepreneurs; and iTel runs on the Spacefon network and is managed by small and medium scale entrepreneurs. However, Space-to-Space is by far the most popular payphone medium.

Popular accounts of "phone ladies," "umbrella people," or "community phones" show that the original goal for developing these mobile payphone systems was to create income generation avenues for operators while expanding the accessibility of telephony to the poor. In Ghana, the story is slightly different. The mobile payphone phenomenon grew out of the need to overcome a serious network problem – callers could not get through to Spacefon lines from Ghana Telecom fixed lines. Interconnectivity has been a significant problem for network providers in Ghana since the first mobile

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[4] The incumbent fixed line network provider.
[5] The dominant mobile phone network provider.

phone company began operating, mainly emanating from conflicts with Ghana Telecom. However, the problem intensified with Spacefon in particular, as its market share ballooned and the need to connect to Ghana Telecom lines became more pressing. This was a particularly serious problem for communication centers[6], all of which run on Ghana Telecom fixed lines at the time.

When the problem was at its peak Scancom held a series of meetings with communication center owners, the outcome of which was the decision to give communication centers the opportunity to buy specially fitted GSM desktop phones which they would use when their patrons wanted to make calls to Spacefon lines, thereby bypassing Ghana Telecom. The issue at stake was to improve connectivity, not necessarily to reduce cost. The idea was marketed to communication centers after a trial period and the goal was to limit access to the phones to people who owned a well-established communication center. At this point the system was closely connected to Spacefon – their partners imported the handsets, fitted them with Spacefon SIM cards, sold and serviced them. The payphones were also associated solely with communication centers, not individuals, and did not have a popular identity.

Their identity and organization changed when these desktop phones found their way into the hands of some individuals who began to offer this service outside the communication center system – on the roadside, in kiosks, convenience stores, hair salons and other small business setups. All of these operated on the Spacefon network, hence their popular designation as "Space-to-Space" to highlight the in-network connectivity benefit. Although Scancom had initially planned for this to be a communication center-based service, the network provider was not averse to this unexpected development since it generated more traffic for the network. Thus, a new industry in telephone service provision was created. Most of these mobile payphone entrepreneurs started during the latter half of 2004 and there were supposedly over 25,000 such operators around the country by the end of 2005. They have proliferated in areas where mobile phone ownership is high as well as where ownership is low.

The important role performed by these micro-entrepreneurs has been discussed in several reports and journalistic accounts (e.g., Hamilton, 2003; Keogh & Wood, 2005; Vodafone, 2005), though not much is documented about trends in their deployments, their characteristics, experiences and future outlook on a more general level. Payphone operators have been instrumental in bringing telephony close to the masses. However, they are no more altruistic than network providers or distributors. Their objective in bringing accessibility down to the level of the poorest is to earn income and profits. Their business goals and strategies therefore have an impact on the type and level of telecommunications access they facilitate.

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[6] Privately owned public access telephone centers. Most also provide secretarial services.

Because of the general celebration of mobile payphones in the context of poverty reduction, it is important to consider them from two different angles – as a means of broadening access to telephony, and as an income-generating livelihood for payphone operators. The former addresses some aspects of the digital poverty (Galperin & Mariscal, 2006) faced by the general population, the latter addresses income poverty faced by micro-entrepreneurs.

Mobile Payphones and Digital Poverty

Largely due to the emergence of mobile payphones, access to payphones in the research areas is fairly high, although payphones are still concentrated in urban centers. More than half of survey respondents indicated they are within 10 minutes of a payphone (Table 5)

Table 5: Distance from Home to Nearest Payphone (%)

Distance	Percent (n = 197)
0 – 5mins	38.1
6 – 10mins	18.8
11 – 30mins	23.4
More than 30mins	5.1
Missing	14.7
Total	100.0

Most payphone operators in Ghana run their business in busy shopping or market districts. The location of others is sometimes influenced by necessity, in that operators are sometimes not as free to choose their location (especially those in more remote locations) as larger intermediaries are. Hence some operators interviewed were situated in areas where human traffic is limited or residents do not make many calls. As such they were not gaining much return on their investment. Although they could chose to relocate their operations to areas that would generate more profits, they are limited by virtue of the need to remain close to the home or other location. Their loss, in this sense, is the gain of their communities whose residents get to use payphone services at the slow pace at which they currently need it.

From a commercial standpoint, profit-making organizations and individuals cannot be expected to willingly provide service in areas where they will not make a profit. Although the argument is now made that in aggregate, low levels of usage add up to significant revenue, looking at the pattern of network expansion and location of mobile phone retail shops and even payphone operators, this aggregation is not enough to attract large and medium-scale organizations to poorer areas. For them, the cost-benefit ratio of sending the full range of their services to these areas is still unattractive. But it is often attractive enough for micro-entrepreneurs who have a relatively low threshold for success, and for whom participation in this market may be primarily a livelihood diversification strategy – yet even they, when they have the

option, are likely to seek out economically active areas in which to provide service. Overall, while there continues to be an imbalance in mobile payphone deployment, payphone operators have successfully increased access to telephony in both rural and urban areas.

Micro-entrepreneurial mobile payphone operators ease digital poverty by making telephony accessible and affordable. Once communities are covered by network signals and network providers and/or their representatives and intermediaries are present providing avenues to purchase handsets and airtime, the affordability barrier to usage becomes evident.[7] Relative to income levels, telephone infrastructure and services may be available but too expensive for people in a community to use. This issue often comes into play even before the signal coverage issue is addressed, because the decision to extend coverage to an area is based on network providers' assessment of the population's ability to use the service. With it's decidedly grassroots origins, Space-to-Space was arguably the first real attempt within the mobile phone industry to address the universal access problem from the perspective of affordability through sharing (of airtime).[8] As with the emergence of communication centers in Ghana, individuals (and usually micro-entrepreneurs) tend to be the first ones to come up with aggressive solutions to the challenges of making telecommunications affordable.

Mobile Payphones and Income Poverty

Over a period of about three years (2003 – 2005), mobile payphones experienced a very profitable run, enabling numerous individuals to make a steady, and in some cases, considerable income. However, they are now in decline, victims of industry developments that are gradually reducing the need for this level of intermediary activity. Figure 1 shows the downward trend in payphone revenues of three mobile payphone operators, a situation that is facing most of such operators in Ghana.

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[7] Usability, in terms of knowledge of how to use the phone is not considered a significant barrier here because the evidence so far is that even poor and uneducated people easily figure out and become comfortable using a mobile phone.
[8] There is some evidence of attempts to do this on the fixed line payphone network by renting out airtime from prepaid payphone cards. However, this seems to have died an early death.

Figure 1: Average Weekly Payphone Revenue
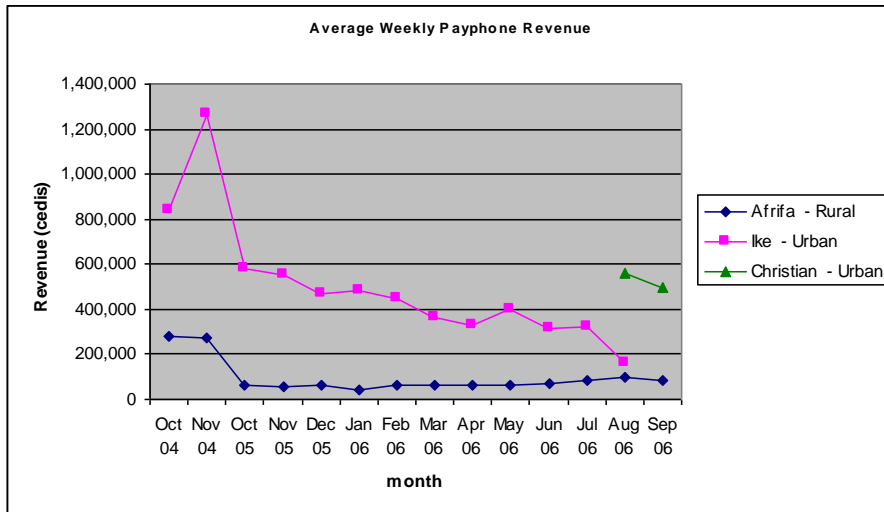
Note: Data for Ike in October 2004 covers 3 weeks: Oct. 11-30; for November 2004 covers 3 weeks: Nov. 1-25; and for August 2006 covers 2 weeks: Aug. 1-16. Data for Christian in August 2006 covers 3 weeks: Aug. 9-21; and for September 2006 covers one-and-a-half weeks: Sept. 1-10.

The results of this study indicate that despite their usefulness, mobile payphones are not sustainable as a long-term business venture for micro-entrepreneurs seeking a secure source of income. Instead, they have acted and continue to act as a temporary measure filling gaps in telephone access as the nation moves closer to universal service. The reason for the downturn in the income-generating capacity of mobile payphones lies in the way people use telephones to meet their communication needs and how payphones fit into this ecology. Trends in the use of payphones are discussed in the next section.

3. Current Trends in Payphone Use

Usage Rates

Currently, both subscribers and non-subscribers make limited use of payphones and as the following quotes[9] illustrate, people prefer to own and use personal mobile phones:

> "*I need my own mobile phone.*" (anonymous non-subscriber)

> "*Most often… I do this payphone when I don't have credits on my phone. Because having, using your own phone is more economical as compared to the payphone.*"[10] (Sylvia, subscriber)

Frequency of payphone use by interviewees varied greatly though most respondents said they were not regular users. At one extreme are those who never use payphones, at the other are some fairly frequent users. For example one subscriber said he has only ever used a roadside payphone twice in his life, while

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[9] Translations of quotations that make heavy use of "Ghanaian English" are provided in footnotes.

[10] "Most often I use a payphone when I don't have airtime on my phone. Because using your phone is more economical as compared to using the payphone."

another said she had used a payphone about 15 times in the previous week. The surveys show that 31.4% of subscribers and 17.9% of non-subscribers do not use payphones at all. Those who do are more likely to use a Space-to-Space payphone than any other type of payphones (Tables 6 and 7). This is essentially related to the degree of availability of payphones. Ghana Telecom phones are often out of order and require purchase of a prepaid card (costing between 20,000 and 100,000 cedis) Westel[11] payphones are very few in number, and One4All[12] and iTel[13] payphones are not as widely available as Space-to-Space payphones.

Table 6: Frequency of Payphone Use for Making Calls (%)

At least:	Ghana Telecom (n = 197)	Westel (n = 197)	One4All (n = 197)	Space-to-Space (n = 197)	ITel (n = 197)
Once a day	4.6	-	4.6	18.8	0.5
Once a week	8.1	2.0	10.2	23.9	3.6
Once a month	17.3	1.0	11.2	15.7	3.0
Once a year	16.2	3.6	5.6	7.6	7.1
Never	53.8	93.4	68.5	34.0	85.8
Total	100.0	100.0	100.0	100.0	100.0

Most respondents rarely use mobile payphones to receive calls, preferring to borrow a friend or family member's phone for this purpose. For all types of payphones, the proportion of respondents who never use them for receiving calls ranged from 66.9% for Space-to-Space to 81.4% for iTel payphones.

Table 7: Frequency of Payphone Use for Receiving Calls

At least:	Ghana Telecom (n = 197)	Westel (n = 197)	One4All (n = 197)	Space-to-Space (n = 197)	ITel (n = 197)
Once a day	4.1	-	4.6	14.7	0.5
Once a week	4.6	1.0	7.6	12.2	1.0
Once a month	5.6	2.5	3.0	5.1	1.5
Once a year	4.6	1.0	2.5	3.0	1.5
Never	81.2	95.4	82.2	65.0	95.5
Total	100.0	100.0	100.0	100.0	100.0

Not only is payphone use limited, expenditure on payphone calls is also low. On average, payphone users in the survey sample use less than 20,000 cedis (about $1.85) per week, and the majority (45%) spend 10,000 cedis (about $0.93) or less (Table 8). All of this leads to limited potential for mobile payphones to generate significant levels of income for most entrepreneurs.

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[11] The second national fixed line operator.
[12] A version of the Space-to-Space payphone running on the Onetouch mobile phone network.
[13] Manned payphones provided by a partner of Areeba, one of the mobile phone network providers.

Table 8: Weekly Expenditure on Payphone Calls

Amount	Percent (n = 148)
1000 - 10,000 cedis	44.6
10,000 - 20,000 cedis	17.6
20,000 - 50,000 cedis	16.9
> 50,000 cedis	6.1
Missing	14.9
Total	100.0

Total represents the number of survey respondents who said they use payphones.

Reasons for Payphone Use

Users of mobile payphones in Ghana include people who own and people who do not own mobile phones. One would expect that non-subscribers would be the primary users of Space-to-Space and other public payphones, especially those who have no family or friends who are subscribers through whom they can access mobile phones privately. Conversations with non-subscribers indicate that payphones are indeed their main access point for making telephone calls. The trend is that they make calls at a payphone but receive calls wherever possible on a friend or family member's phone. Even so, non-subscribers do not appear to be particularly avid users of payphones – e.g., in Apemanim, the rural research site, where the options for payphones inside the village are limited to just two operators, both operators indicated that they have just a handful of regular customers (four or five)[14]. In Accra, Charipearl, a non-subscriber, uses a payphone about five times a week, mainly to make work-related calls to her employer and sometimes to call her friends (she receives calls on her sister's mobile phone).

For mobile phone subscribers on the other hand, the primary utility of payphones is when they have run out of airtime and need to make an urgent call. For example, one interview respondent explained, "*It's only a time when I didn't have credit on my phone. And sometimes too, when I also want to save some units.*" This function of payphones was particularly valued when network providers (especially Spacefon) sold airtime only via expensive scratch cards (the least expensive cost 75,000 cedis, about $8). In that environment, subscribers were more likely to have need of a payphone at certain times of the week or month – generally towards the end of the pay period when they were low on cash.

Subscribers also appreciate the availability of payphones when their mobile phone battery runs down. Osei Kwadwo, for example, states, "*The way it helps us is that even I have a phone, maybe my phone has*

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[14] This could also be because some users make calls at other payphones outside the village.

gone off, maybe my battery is low. So if some wasn't here I would suffer, maybe the person I want to call I won't be able to call them"[15]

Subscribers on one network sometimes use a payphone to call a contact who subscribes to a different network in order to benefit from the lower cost of in-network calls. This was one of the original objectives of the Space-to-Space payphone and the other variations that followed, but it seems to be a secondary function now. Phone logs and records from payphone operators showed that calls tend to be to Spacefon lines regardless of the network on which the payphone operates.[16] In any case, with most network providers beginning to implement uniform pricing for all calls, the cost advantage of in-network calling is being eroded.

Another strategic function of payphones for subscribers is to evade caller identification, as these two subscribers explain:

> I go and make calls sometimes when you are calling somebody and he knows your number…. Especially maybe he's owing you or you need the person… He or she never picks the phone so you have to move to a different place…. use another number to call in order to get the fellow….yeah, then he was trying to dodge your number. (Cee)

> … at times, when you, the person knows your number, he might not pick. So you just change and then, for him not to be able to see that it's you or…. Most of my customers, customers, like when they know your number they don't want to receive your call. Because they know by all means when you call them it's because of money. (Akua)

In addition, interview respondents revealed that although the mobile payphone was a useful service, they only used it because they had no other option. There were several aspects of mobile payphone use that users found inconvenient or unpleasant. For example, money-conscious callers would often have arguments with payphone operators over the actual length and therefore cost of their calls, especially when the call was just a few seconds over the minute.[17] I observed callers who would ask to see the phone

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[15] The way the payphone helps us is that even if I have a phone, maybe my phone will have gone off, maybe my battery is low. So if there were no payphone, I would suffer, maybe I will be unable to call the person I want to call.
[16] One of the reasons the payphones introduced by other networks have been relatively unsuccessful is that most patrons want to call Spacefon subscribers, which results in more expensive call charges. One operator reported that she sometimes prefers to lose business by pretending to have run out of airtime rather than make an off-network call for a customer because she makes little or no profit on off-network calls.
[17] Since operators charge by the minute, the arguments would usually be over whether the call had really gone into the next minute, and even if it had, whether it was fair to charge for a full minute. According to one payphone

log to confirm the length of their call before agreeing to pay the fee being charged. As one female subscriber put it:

> … most of them are thieves. ... You call, you know you have used like one minute, two minutes they will tell you you have used four, five, and they have to charge you for that. So if you are not familiar with the, the units *diee-a*, they will cheat you. So it depends on who you get, the person being a good person. ... that is why it doesn't encourage me to use it at times.[18]

Apart from these billing problems, there was also the issue of the conditions under which payphone calls are usually made – e.g., environmental noise or lack of privacy to have confidential or personal conversations. Most payphones are located along major roads or in market areas where there is a lot of vehicular and human noise. Christian, a payphone operator in Accra, is one of the few who eventually built a small booth for his business largely in response to his customers' complaints about being exposed to the elements when trying to make calls. When they are allowed to, some callers, in an effort to gain some privacy or reduce background noise, will walk a short distance away with the payphone to have their conversation. This is more likely to be helpful in areas like Apemanim, where there is generally less noise anyway, and users have more options for moving to a quiet place to make a call in privacy. However, some operators, especially those using regular rather than desktop handsets expressed fears that someone might abscond with their phone, so they generally reserve this privilege for customers they know well.

Others simply consider use of public payphones to be a humiliating experience. One interview respondent, while stating that the Space-to-Space payphone system is "*essential*" especially for low income earners, noted that on the few occasions in 2005 when he had to use a public payphone because he had lost his phone, he "*felt cheap*" because,

> It's like, you know, why won't you buy units on your phone, use it, you know? And in you know, like a professional of, you know, your sort…. why would you be using that instead of your phone? … you know there are people around. And then you don't have your privacy. There's someone, you know, waiting, you know, to bill you. So you will be feeling like you can't have your privacy … I wanted to keep it [the call] short.

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operator (Ike) one of his employees had been involved in one such argument that had resulted in a fist fight and the police had to be called in to break it up. Some operators told me they now use judgment calls to determine how many seconds over the minute constitutes an additional minute for individual calls, just to avoid such arguments.

[18] "Most of them are thieves. You know you have spoken for one or two minutes but they will tell you that you have used four or five minutes and they have to charge you for that. So if you are not familiar with how airtime used is calculated, they will cheat you. It depends on whether you get a payphone operator who is a good person. … that is why I am not encouraged to use mobile payphones often."

Impact of Electronic Credit Transfer System on Mobile Payphone System

Although there are a variety of reasons for the downturn in mobile payphone use the deathblow was dealt by the introduction of the electronic airtime transfer system by network providers in 2005.[19] Electronic transfers make it easier for subscribers to top-up with minimal amounts – enabling top-ups of as little as 7000 cedis (about $0.70). This was a critical benefit because of the existing tendency for people to make short calls; on average a payphone user would probably spend around 5000 to 10,000 cedis (about $0.50 - $1) on a 2-3 minute payphone call.[20] Consumers' desire for the ability to buy and use small amounts of credit at a time was a hidden demand that was revealed in the success of mobile payphones. With roughly the same amount of money that they would spend on a 2-3 minute payphone call subscribers could now purchase airtime directly onto their phones. Not only did they no longer need to do business with payphone operators, but because network providers bill by the second, the subscriber also would get more talk time than they would on a payphone, where billing is by the minute. Furthermore, non-subscribers were also more encouraged to acquire mobile phones because airtime was now more affordable, thus reducing the pool of non-subscribers whose main source of telephony is payphones.

Thus, a recurrent theme from subscribers was that when they use a payphone, they have usually first eliminated the possibility of getting an electronic credit transfer: "*I wasn't having units on my phone. And I was outside too, where I was there was no, the transfer was not availabl*e" (Akua). Similarly, Eric, an accounting technician, explains that he uses a payphone,

> Maybe once a month or something… I normally use my phone whenever I want to make calls. That's when I have units. And I only use the Space-to-Space if I want to make an urgent call… That's when it is that I have maybe two-five… and I've run out of units. I can just go there, make maybe an urgent call…. Because I cannot buy units with the two thousand, five hundred, I cannot even transfer units with the two, but I can make a call.[21]

Influence of Location and Mobile Phone Ownership on Payphone Use

It could be argued that the above trends in payphone use reflect the behavior of urban subscribers, and that other types of users such as non-subscribers or rural dwellers would behave differently. To take this

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[19] Under this system a vendor transfers airtime directly from his or her phone, onto the phone of the purchaser, without the need for any physical media such as a scratch card. This technically enables the transfer of both large and small amounts of airtime, but is particularly beneficial to those who want small amounts.

[20] Analyses of some payphone operators' call records confirmed this.

[21] "Maybe once a month or something… I normally use my own phone whenever I want to make calls – that is when I have airtime on my phone. And I only use Space-to-Space payphones if I want to make an urgent call – that is when I have maybe two thousand five hundred cedis … and I've run out of airtime. I can just go there and make an urgent call…. Because I cannot buy airtime with two thousand five hundred cedis, I cannot even buy electronic airtime transfers with two thousand five hundred cedis, but I can make a payphone call."

into account, analyses[22] were conducted to distinguish the behavior of different types of mobile phone subscribers and users as outlined in the following hypotheses:

H.1: Non-subscribers will use payphones more frequently than subscribers

H.2: Respondents in rural areas will use payphones more frequently than respondents in urban areas

H.3: Non-subscribers will spend more on payphone calls than subscribers

H.4: Respondents in rural areas will spend less on payphone calls than respondents in urban areas.

To evaluate frequency of payphone use, Space-to-Space phones were used as the standard, because they are the most widely used payphones. Non-subscribers in the sample do use Space-to-Space payphones more frequently than subscribers do – about 49% do so daily or weekly compared to 38% of subscribers (Table 9). The difference between subscribers and non-subscribers was however not statistically significant, indicating that both categories probably use payphones to a similar extent. Thus the first hypothesis was not supported. Rural respondents also use Space-to-Space more frequently than urban respondents – almost 47% do so daily or weekly compared to about 41% of urban respondents. This result was statistically significant providing support for the second hypothesis.

Table 9: Frequency of using a Space-to-Space Payphone to Make Calls (%)

	Type of Respondent		Area of Residence*		
Frequency	Subscriber (n = 118)	Non Subscriber (n = 79)	Urban (n = 150)	Rural (n = 47)	Total (n = 197)
At least once a day	16.1	22.8	22	8.5	18.8
At least once a week	22.0	26.6	19.3	38.3	23.9
At least once a month	20.3	8.9	17.3	10.6	15.7
At least once a year	8.5	6.3	8.0	6.4	7.6
Never	33.1	35.4	33.3	36.2	34.0
Total	100.0	100.0	100.0	100.0	100.0

*Pearson Chi-Square $(4, N= 197) = 10.089$, $p = .04$, Cramer's V = .226.

As Table 10 shows, the majority (over 50%) of both subscribers and non-subscribers spend 10,000 cedis or less on payphone calls.

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[22] Due to the nonrandom nature of the sample selection, statistical analyses apply only to the survey sample and are not intended to be generalized to the population.

Table 10: Weekly Expenditure on Payphone Calls (%)

Amount	Type of Respondent		Area of Residence		
	Subscriber (n = 61)	Non Subscriber (n = 65)	Urban (n = 93)	Rural (n = 33)	Total (n = 126)
1000 - 10,000 cedis	52.5	52.3	50.5	57.6	52.4
10,000 - 20,000 cedis	21.3	20.0	20.4	21.2	20.6
20,000 - 50,000 cedis	16.4	23.1	21.5	15.2	19.8
> 50,000 cedis	9.8	4.6	7.5	6.1	7.1
Total	100.0	100.0	100.0	100.0	100.0

Differences not statistically significant. Missing responses not included in calculations.

However, on average, non-subscribers spend slightly more than subscribers do (19,315.38 cedis vs. 19,156.64 cedis). The difference in their mean expenditure is less than 200 cedis. Almost 60% of rural respondents spend 10,000 cedis or less on payphone calls, compared to 50% of urban respondents. Urban respondents' average expenditure is about 5000 cedis more than that of rural respondents (20753.28 cedis vs. 14969.70 cedis). None of these differences were statistically significant; therefore, the third and fourth hypotheses were not supported.

The fact that the only hypothesis supported was that rural residents are more frequent users of payphones is consistent with rural community members being less able to afford personal mobile phones. Taken together this analysis suggests that at a basic level of access and use, there is not much difference between subscribers and non-subscribers in rural and urban locations. While non-subscribers and rural residents use payphones more frequently, they do not spend much more than subscribers and urban residents.

It is possible that once non-subscribers reach the point when they need to spend a lot of money frequently on mobile payphone calls it makes sense for them to just become subscribers. Current subscribers recalling the time prior to their acquisition of a mobile phone would often make reference to spending too much money on payphone calls. "*I used to waste a lot of money on these ones*" Yinka explained, for example, indicating the payphone where she now works, "*but now that I have a phone now, ... I don't waste money*." Paul was also pleased to get a phone for the same reason,

> By then I didn't have a phone. The reason why I'm happy about this, the phone that the man, the pastor gave it to me, er, I spent a lot of money there [at payphones], for calling my brothers at the town here. … By then even the fact is that, by then I haven't … a lot of money. So if I spend about seven thousand, it disturb me. Maybe two thousand, three thousand, seven thousand and

over, I used to spend. … Yes. Any moment that I use, maybe ten thousand, fifteen thousand, seven thousand. The lowest is maybe three thousand.[23]

In fact, Paul preferred to make calls at the traditional communication centers because calls there were cheaper than at the Space-to-Space payphone. During this time, he was not making much income so having to spend between 7000 and 15,000 cedis on a payphone call twice a week was difficult for him.

In essence, payphone use has been a necessary but occasional practice for most people, and use of a personal phone is generally preferable. This leads to the conclusion that mobile payphones are becoming less and less useful as a means of generating income for poor people, although they continue to perform an invaluable connectivity role for users who do not own mobile phones as well as occasionally for mobile phone subscribers.

These findings on mobile payphones do not negate the importance of mobile telephony in developing countries. What they indicate is that the long-term value of mobile telephony can be found in some area other than an income-generating role. Section Four explores the possibility that this area is that of facilitating connectivity between individuals and the people or resources they want to remain connected to.

4.   Trends in Mobile Phone Use

Uses of Mobile Phones

The interview and survey results show that whether using a personal phone or a payphone, people have a variety of uses for mobile phones, including personal, interpersonal, economic and work-related uses (Table 11).

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[23] "By then I didn't have a phone. The reason why I'm happy about the phone that the pastor gave me is that I used to spend a lot of money at payphones, calling my brothers in town…. The fact is that by then I wasn't making a lot of money. So if I spend about 7000 cedis on a payphone call, it is difficult for me. Maybe I would spend 2000, 3000, 7000 cedis and over…. Yes. Any time that I would use a mobile payphone, I would spend maybe 10,000, 15,000, 7000 cedis. The lowest amount I would spend is maybe 3000 cedis."

Table 11: Main Reason for Making Phone Calls (%)

Reason	Urban (n = 145)	Rural (n = 43)	Subscriber (n = 114)	Non-subscriber (n= 74)	Total (n = 188)
Business or job-related purposes	22.1	16.3	26.3	12.2	20.7
Family – non-financial issues	20.7	14.0	23.7	12.2	19.1
Family - financial issues/remittances	17.9	44.2	21.9	27.0	23.9
To chat with friends	15.9	14.0	16.7	13.5	15.4
Emergency situations	12.4	11.6	7.0	20.3	12.2
Education or academic purposes	7.6	0	3.5	9.5	5.9
To discuss social functions	3.4	0	0.9	5.4	2.7
Total	100.0	100.0	100.0	100.0	100.0

Missing responses are not included in the calculations.

Overall, calling family dominated reasons for making phone calls (43% total) followed by business related calls (almost 21%) and calls to friends (15%). A noticeably higher proportion of rural users called family for financial purposes (about 44% compared to 18% of urban users), illustrating the importance of connectivity to financial resources for rural people.

Regardless of location (rural or urban) and occupation, the majority of interview respondents also indicated that social interaction with family and friends dominates their mobile phone use. Wofa, a fisherman in Prampram, bought a mobile phone in 2005 mainly because he believed it would help him with his work, and it has indeed turned out to be a valuable resource for him. However, when asked how he and his fellow fishermen use mobile phones, Wofa's answer was that, "*We use it different, different.*"[24] Amongst those different ways he included the following: sending real time alerts to fellow fishermen about good and bad fishing areas, getting help in case of an emergency on or off shore, letting family members know your movements, and contacting customers and suppliers.

The reasons for appreciating contact with family and friends seems to be related to the need to be socially connected, and to have access to help when needed. With respect to the latter, a student recalled, "*I called my sister to tell her I don't have money and she said I should come over, she's at home.*" Another respondent explained, "*…all my brothers and sisters …They used to call me, and I used to call them, about our situation… Even my mother too, I used to call her … If I need something or I want to talk to [her].*"

Most respondents who were engaged in some business venture said their mobile phones were useful in work activities and a few, such as Wofa, indicated that work-related uses exceeded social uses: "*The most*

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[24] "We use it in many different ways."

frequent is the one we use to work. If I have a contract with someone and the contract goes through, I can call to say the contract has gone through or it has not…" However, when asked which type of interaction occurs more often, and which is more precious, most respondents chose social interaction, or rated them equally. For example, comparing the value of work-related and family connectivity, Wofa pointed out that "*they are all important.*"

Similarly, Paul, a carpenter bought his phone in November 2000 with the intention of using it to keep in touch with his customers but sold it after a few months because he could not afford to use it. Five years later his pastor gave him a phone to facilitate communication while they were establishing their church. By this time his business was also picking up, putting him in a better position to finance usage of the phone. In addition, he had switched to a network that sold airtime in smaller denominations, meaning he could buy airtime as and when he needed them. Although the mobile phone has been immensely helpful in his business (especially enabling him to take advantage of opportunities for work as they arise), he primarily uses it for coordinating church-related activities. This story demonstrates the dynamic relationship between telephony and employment generation – Paul could not afford to use a mobile phone because he did not have a thriving business. Later, when the health of his business had improved it was more feasible for him to maintain a mobile phone. Mobile phone use has been credited with enabling entrepreneurs generate business, but for Paul, owning a mobile phone could not help improve his business until the business had itself attained a certain level of stability.

According to Esther, a dressmaker, the size of her personal and business networks has not increased significantly since getting a phone, but she has improved connectivity with the existing network and communicates better with her clients. But above all, "*It makes me get to my friends and relatives … get to them often. Unlike first, you have to take car and go or walk …[it] saves time.*" Similarly, Akua, a trader, noted that when she actually originates a call, it is often for business purposes, but the bulk of her activities on the phone – flashing,[25] text messaging and free voice calls at night – are with family and friends.

Unexpectedly, in the rural research site where farming is the major occupation, none of the few residents who own a mobile phone (apart from two payphone operators) used it explicitly for business or work-related purposes. Out of a population of about 300, some 20 or so people (mostly young men) have mobile phones. Comments by some residents point to a perception that the phone acts as a status symbol for most of the young owners, who are rarely able to buy airtime. Other mature owners use their phones

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[25] That is, generating missed calls either for a return call, to communicate a pre-arranged message, or to tease.

mainly to stay in touch with family. Regarding the use of his phone to facilitate his work, one farmer said, "*I don't use it for business…. I don't discuss the farming with anyone in that way*". It was only while he was working as a taxi driver in the past, that this farmer actively used the phone in his work either to have discussions with his driving instructor, or to inform the owner of the car when the car broke down. The majority of his calls (and the calls fellow villagers make on his phone) are to family and friends. Other people in the village, including the queenmother and the linguist, confirmed this tendency.

This is in direct contrast to the situation amongst mobile phone-owning fishermen in Prampram, a peri-urban village, and suggests that use of mobile phones to facilitate work activities is related more to the nature of the market economy in each area, and the particular livelihood activity (subsistence farming in Apemanim vs. fishing in Prampram) than to rural or urban status. Whereas fishermen, for example, are usually in possession of their own transportation and can change direction at any time in response to new market information, farmers may be restricted by the practicality of trying to move their product to different markets, having to arrange transportation and deal with possibly bad access roads. Particularly for a subsistence farming community such as Apemanim, it may simply make more sense to just go to the nearest market.

Benefits of Mobile Phone Ownership

Most mobile phone subscribers in both rural and urban locations mentioned advantages such as ability to contact business partners and customers, more regular contact with friends and family, being able to check a person's whereabouts before going to visit them, being reachable to people who need them, and being able to reach people they need, as major benefits of having a mobile phone (Table 12).

Table 12: Major Benefits of Owning a Mobile Phone (%)

Benefit	Urban (n = 90)	Rural (n = 23)	Total (n = 113)
Easier and faster communication with family and friends	36.7	43.5	38.1
Mobility	26.7	21.7	25.7
Communication for business/work purposes	12.2	-	9.7
Communication in emergency situations	11.1	4.3	9.7
Easier and faster sending and accessing information	6.7	17.4	8.8
Other	6.6	12.9	8.1
Total	100.0	100.0	100.0

Missing responses are not included in the calculations.

This broad overview of some of the research findings indicates that although rural dwellers may have less access to mobile telephony than urban dwellers do, people in both areas are quite similar in how they use mobile phones. The value users attach to ownership and use of the mobile phone is predominantly that of

connectivity, as this statement by a subscriber illustrates: "*The merits about using a mobile phone you get connected let's say everywhere. Supposing my network is all over the country, all over the world you'll get connected everywhere and you'll receive messages in time*" (Sylvia, student). This includes links to business and personal networks, although connections to personal networks seem to be prioritized. To most subscribers and users, use of the mobile phone is a way of nurturing kinship, friendship and business ties, all of which have the potential to generate resources as and when needed.

5.   Discussion and Conclusion

The mobile payphone phenomenon in Ghana was generated by a combination of interactions between network providers, communication center operators and end-users, based on existing conditions in the industry and the economy. This enactment took advantage of certain features and characteristics of mobile phone technology (e.g., lack of wires, ease of subscription, installation and use, prepaid billing, high cost of handsets), as well as the state of network provider relations (interconnection disputes), high levels of unemployment, and entrepreneurs' search for livelihood diversity. Despite the important functions payphones serve for users, the results of this study suggest that mobile payphones are a transitory solution to the problem of telecom access.

At present the cost of becoming a mobile phone subscriber is such that anyone who really wants to become a subscriber can probably do so, if the extent to which they need to make calls makes it cost-effective to get a phone. This may be linked to the amount of economic activity a person is engaged in (particularly for those who buy their own subscriptions as against getting it as a gift). Patterns of payphone use revealed the demand for small amounts of airtime, which network providers responded to by introducing electronic airtime transfers. To some extent, however, payphone use may also reveal demand to users themselves. In areas of high economic activity, consumers start out using payphones frequently, on the assumption that they cannot afford to own and maintain a mobile phone subscription. However, as they realize how much they are spending on payphone calls (and as mobile phone equipment and airtime prices fall), it begins to make more sense to put together the funds to buy a phone and a subscription.

Thus in the rural research site, subscriber levels are low and there are few subscribers to share with, yet payphone use is also low. This could be because economic activity is limited and residents not only cannot afford to own and use a mobile phone, but also may not even have a pressing need to do so. While urban areas may be able to support a large number of individual payphone operators, rural areas probably have room for only a handful of such operators, depending on the characteristics of the population. In the

peri-urban and urban research sites, subscriber levels are fairly high and payphone use is relatively low, probably because most of those who need to make a lot of calls have obtained personal mobile phone subscriptions.

The emergence of mobile payphones resulted in the abandonment of communication centers,[26] which, as one interview respondent observed, effectively became "secretarial centers" because mobile payphones were cheaper and more accessible. But a parallel process has also led to the decline of mobile payphones, as based partly on their observations of payphone use, network providers have upstaged payphones with electronic airtime transfers. This is an important aspect of the involvement of micro-scale operators in the ICT industry – if their services are successfully co-opted or built upon by network providers, they are likely to lose patronage. This has potentially damaging implications for the entrepreneurs and their clients.[27] Thus the fate of mobile payphone operators is intertwined with the behavior of mobile phone users, whether they are subscribers or not, as well as the behavior of network providers. As innovative as the mobile payphone industry has been, it provides a very specific service that is difficult to adapt to changing conditions. This is because amongst other things, its primary tool is a device (the mobile phone) that has a high potential to be individually owned by the very population the payphone industry serves.

Furthermore because of the mobile phone's portability and anytime/anywhere capabilities, it relegates use of any type of payphone to situations of emergency when the caller either does not have or cannot use the phone that they carry on them perpetually. Nevertheless, due to low economic attractiveness, some localities will require universal access mechanisms for the foreseeable future. Thus there will still be the need for policy-makers to develop strategies to identify these areas and ensure at least payphone access for them. Unlike fixed line deployment, the only real investment the network provider has to make is to extend the network signal. Furthermore, network providers can secure resources from the universal access fund (GIFTEL), which facilitates the building of cell sites to extend signal coverage.[28] Although micro-entrepreneurs have shown themselves ready to take the rest of the risk with respect to the availability of a viable market for mobile phone service, it remains to be seen whether focusing only on signal coverage will be enough to resolve the access gap in these unattractive areas. There may still be life for mobile payphones in peri-urban and rural areas although ultimately most will probably face the same fate as payphones in urban locations.

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[26] Marcus Koll (2007) found that for the same reason, all communication centers in the Akatsi district in the Volta region of Ghana had been turned into textile shops or drinking bars.
[27] Medium and large-scale establishments may be better able to weather such changes, but micro-entrepreneurs are particularly vulnerable.
[28] This is subject to competitive bidding.

From fixed line accounts to postpaid mobile phone accounts to prepaid mobile phone accounts, there has been an increasing amount of flexibility incorporated into technology, management systems and services that have translated into more flexibility for users to manage their telecommunication practices within whatever limits exist. As network providers respond more or less effectively to user appropriations, mobile telephony is becoming more affordable, hence individual subscriptions are growing and the need for shared access is declining. For users and network providers, this means expansion of individual access to mobile phones, but for payphone operators, this means a loss of livelihood. This is the process that has taken and is still taking place in the Ghanaian mobile phone market.

The relevance of these findings to ICT for development discussions is that in the long-term, mobile phones appear to be more effective as a livelihood resource (i.e., as a communication tool in livelihood activities) than as a direct source of livelihood (i.e., as a source of income generation) for the poor. This is because micro-entrepreneurs (such as mobile payphone operators) are particularly susceptible to industry shocks, such as the development of new technologies, introduction of new products, or drop in prices. Although they may have a lot of flexibility to change occupations, poor people also have limited resources to invest. In an industry that changes as rapidly as the telecommunications industry does, the vulnerability of poor entrepreneurs is heightened, which goes against the goal of securing livelihood sustainability. Thus the involvement of poor people as entrepreneurs in the mobile phone industry may best be approached as part of a livelihood diversification strategy, rather than as a primary source of livelihood.

On the other hand, as a resource that people use to facilitate communication in the normal course of whatever livelihood activity they are engaged in, changes in the deployment of mobile phones bring significant long-term benefits to end-users, especially those changes that make the tool cheaper to acquire and use. Once consumers can afford to own and use a mobile phone to meet their connectivity needs, they incorporate the phone into any activities in which the phone is useful to them.

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