

**Mobile Cell Phones and Poverty Reduction: Technology
Spending Patterns and Poverty Level Change among
Households in Uganda**

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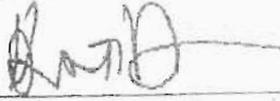
Declaration

This dissertation represents original work by the author and has not been submitted in any other form to another university. Where use has been made of the work of others it has been duly acknowledged and referenced in the text.

The research for this dissertation was performed in the School of Development Studies at the University of KwaZulu-Natal, Durban. Research was undertaken under the supervision of Professor Julian May during the period from January 2007 to November 2007.

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Signed,



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List of Acronyms and Abbreviations

DfID – Department for International Development, United Kingdom

GSM - Global Positioning for Mobile

HH – household

ICT – Information & Communication Technology

ICT4D – Information & Communication Technology for Development

IMF – International Monetary Fund

ITU – International Telecommunications Union

MDG – Millennium Development Goals

MoWHC – Ministry of Works, Housing and Communications

MTN – Mobile Telephone Network

PEAP - Poverty Eradication Action Plan

RCDF - Rural Communications Development Fund

SLF – Sustainable Livelihoods Framework

SME – Small and Medium Enterprises

UBOS - Uganda Bureau of Statistics

UCC – Uganda Communications Commission

UGX – Uganda Shilling Currency

UNStats – United Nations Statistics

UNDP – United Nations Development Programme

UNHS – Uganda National Household Survey

UPE – Universal Primary Education

UPTC - Uganda Posts and Telecommunications Company

USD – U.S. Dollar

UTL - Uganda Telecommunications Limited

Abstract

This paper examines the spending behaviour of households with mobile phones in rural agricultural Uganda and whether such strategies such as substitutions have affected the well-being of these community members. According to the findings, rural households are willing to make sacrifices such as travel expenses and store-bought food budget in order to address the expenses of mobile phone services. While gender inequality through exacerbated asset control and mobile phone inexperience drive further digital divide in this village, the proliferation of small businesses development encourages phone ownership for women. Such strategies to afford a mobile phone or mobile phone services are undertaken to help facilitate long-term asset accumulation. For development studies, the analysis recommends a revised form of development thinking in a growing knowledge economy.

Chapter 1: Introduction

The International Telecommunication Union (ITU), an United Nations-funded agency, announced that in 2006, four billion mobile and fixed phones were in use around the world (ITU, 2007a: 9). Of the mobile phone users, 61 % are first time subscribers from developing countries. Africa, alone, now accounts for 192.5 million of these mobile phone subscribers, an increase of almost 660 % compared to 2001 figures (ITU, 2007b). This dramatic expansion of Information and Communications Technology (ICT) has been heralded as a potentially productive tool in economic development. A recent study is reporting that developing countries could stand to gain increases of close to 0.59 % of their Gross Domestic Products (GDP) if their populations gain 10 phones per 100 people (Waverman *et al.*, 2005: 11). With the proliferation of cheaper mobiles and lowering costs of network connections, mobile phones in particular appear to drive affordable and enabling technology, even for the economies of the developing world. This suggests that telecommunication firms have gone beyond developed countries' saturated mobile phone markets and are moving to capture new consumers within emerging markets. Mobile phones show potential for higher national growth rates, and increasing industry interest, particularly in emerging areas where phones were once non-existent.

While there are many examples of ICT projects which aim for lower transaction costs, diminished risks, and improved efficiency (Cecchini & Scott, 2003; Wattegama, 2005), little research actually explores how mobile phones impact on rural poverty and development. Rhodes suggests that this lack of research keeps the economic effect of ICT use in rural communities "speculative" (Rhodes, 2002: 270). A dearth of direct evidence would also mean that aggregated macroeconomic information on ICT is incomplete. The opportunity to make beneficial ICT policy decisions, targeted at the poor, is therefore missed. Governments in developing countries, or non-governmental organizations who seek to implement ICTs within their national poverty reduction strategy frameworks, can justify their investment in technology by referring to conclusive research on the effects of ICT on the poor. The current popularity of and expenditure on mobile phones, as well as the potential impact on pro-poor policies makes a strong case for research.

Previous research on poverty impacts from mobile phones or technology

spending is limited. Few publications explore household expenditures on mobile phones and the impact of these expenditures by substitute phone and airtime purchases for other items (Milne, 2006; Ureta, 2005). In Milne's study of four developing countries, a growth in income sees a drop of food spending in proportion to an increase in communication spending (Milne, 2006: 9). Banerjee and Duflo's study suggests the substitution of festival outing costs for ICT ownership (Banerjee & Duflo, 2006: 6). In the "Towards an Africa e-Index" study, the Research ICT Africa! (RIA!) researchers find some African households paying up to 10% of their expenditure budget on ICTs when 2-3% is the average ICT budget spending in developed countries (Gillwald, 2005: 13). The updated research on household expenditures and market demand on mobile phones can ensure that national policy such as universal access legislation acknowledge target population needs. The focus of this dissertation is to explore spending behaviour in rural Uganda and to see if any impact evidence can influence future rural communication policy research in the country.

1.1 Uganda and Telecommunications

Uganda, with a Gross National Income (GNI) per capita at USD \$ 280 (UNDP, 2007) and with 84 % of the population living in rural areas, is a country experiencing a similarly dramatic increase in mobile phone usage. Uganda had over 3.5 million subscribers and 2.4 billion minutes of domestic calls in the 2006/07 fiscal year (Masambu, 2007a: 13 & 17). The subscriber numbers have risen since the liberalization of the communication sector and creation of the Uganda Communication Act of 1997 (UCC, 1997). The core objectives of the policy were to ensure widespread coverage and affordability of mobile phones in the region.

The Act has benefited some citizens through greater network choice and lower costs for telephony, however, some of Uganda's rural poor remain out of network coverage or unable to afford mobile phones. Such inaccessibility further drives the 'digital divide', i.e. isolation from technology and missed socio-economic opportunities. The Ugandan government recently implemented the Rural Communications Development Fund to meet the communication needs of the disadvantaged (UCC, 2001), but regulators must first understand the dynamics of the mobile phone market for economic growth and the strategies for communication by

the poor. This Uganda case study brings an unique perspective of how poor households have changed their spending patterns after their choice of mobile phone handset purchase or services, given the recent changes of their external environment. This case study will particularly examine three areas in spending behaviour: substitutions made for mobile phones, financial services provision, and intra-household asset negotiation. The findings of the spending behaviour will help then to explain the effects on well-being and livelihoods for the rural poor. Research is necessary for Uganda to maintain favourable conditions for all citizens in a growing IT-based knowledge economy. Uganda, a majority rural country with progressive regulation, competitive mobile phone industry and dramatic growth provides an ideal case study conditions to demonstrate the impacts of mobile phones on the rural citizens of the country.

1.2 Study Rationale

1.2.1 What does the 'D' really mean in ICT4D research?

Research in the field of Information and Communication Technology for Development (ICT4D) has historically concentrated on technological impact and much less on socio-economic impact. Agencies deployed new technologies in villages, tested functionality, and then documented technical successes or failures. Heeks states that ICT4D articles have usually focused on the “case application of the theory rather than the theory itself” (Heeks, 2006: 1). The lack of development theory and policy implications behind technology means a need to test ICT4D research paradigms and frameworks, which could stimulate future developmental research and debate.

Current work on developing theory in ICT4D includes the poverty concept application of the sustainable livelihood framework (Duncombe, 2006; Albu & Scott, 2001). This pilot case study works in conjunction with the University of KwaZulu-Natal (UKZN) School of Development Studies' project, 'Poverty and ICTs in Rural and Urban East Africa' (PICTURE Africa). The pilot study applies the framework in its data collection. The larger PICTURE Africa project develops household surveys and qualitative data with an ICT emphasis in order to develop a poverty framework

and to observe the multi dimensions of poverty as it applies to ICTs in East Africa¹. This dissertation research will contribute towards this project as well as ICT4D research by contributing to new evidence of socio-economic implications of mobile phones.

1.2.2 Rationale: Gender and ICTs

Gender and generational inequalities are usually sidetracked by ICT4D studies when technical outputs are more important in the study than observing the further digital divide between men and women. Gender and ICT expert, Nancy Hafkin notes “that while technology empowers, it also very much affects and alters gender relations” (Hafkin, 2007:1). The question remains as to how the technology playing field can provide both men and women with an equal opportunity at resources and skills. Governments are realizing the issue of gender non-neutrality with ICTs. Uganda’s policy framework, under the Ministry of Works, Housing and Communications (MoWHC), attempts to address gender through objective 4.2 (j): “to ensure gender mainstreaming in information and communication programmes and in ICT development” (MoWHC, 2003: 33). Gender research, particularly in ICTs, can benefit policy, which aims at addressing the digital divide between men and women. The research from this study will attempt to show mobile phone adoption has contributed to changes within households in terms of asset ownership and budget spending decisions between household members.

1.3 Objectives and Research Questions

Given the need for research in the area of ICTs and poverty, the fundamental research question that this project hopes to answer is how has access to mobile phones affected the spending behaviours of households in rural Uganda. The following sub-questions are proposed:

Substitution: What substitution choices did an individual within a household make in exchange for the mobile phone or mobile phone services?

¹ While the pilot study was informed by a methodology development PICTURE Africa workshop in December 2006 and further discussions with the project’s researchers, this research is an independent stand-alone piece of work designed, collected and analysed by the researcher.

Savings or Financial Services: How have individuals and households changed their financial planning as a result of mobile phone ownership and usage?

Users within Households: How are individuals within households negotiating budgets to take account of mobile phone use?

Under the proposed sub-questions, this research project first assesses how households manipulate their expenditure budgets in order to acquire mobile phones and their services. This study attempts to appraise the opportunity costs that households give up in order to acquire mobile phones. The study will also explore how new and existing financial services usage have changed in order to meet their spending behaviour needs. With the proliferation of microfinance institutions, informal savings groups and direct airtime transfers, the changes in financing their spending can be investigated. Lastly, the changes of negotiation power within a household can be investigated in order to see if the mobile phone's entry in to the home changes the expenditure budget control among family members. The aspects of substitution, financial services provision and intra-household dynamics will all contribute to the understanding of mobile phone spending and behaviour in a household.

Given the spending strategies of households, the research hopes to also address how these adjustments in spending behaviours have an impact upon the household's level of well-being. The research that aims to answer these questions will be based upon a case study, which will take place in rural Uganda. This case study will provide an opportunity to examine a specific experience with mobile phones within a particular political and social context in eastern Africa and engage further ICT4D research and debate.

Ultimately, the mobile phone is a tool that enables citizens to communicate with family and friends, to save on transport costs, to identify and to take advantage of economic opportunities and to react immediately to mitigate shocks and vulnerable situations. The ability to understand these changes in terms of savings and costs for the household will provide evidence for policy makers on the developmental progress which is contributed through technology and, thereby, improve ways of better telecommunication outreach to the poor and rural areas.

1.4: Sustainable Livelihoods Approach

This study will attempt to determine the micro-level effects of mobile phones upon households. The sustainable livelihoods framework (SLF) approach to poverty will analyze how the assets accumulated by households are utilised towards their household livelihood strategy and what effect such strategies have on their well-being. The first research problem will look at how the five SLF capital assets (physical, natural, social, human, financial capital) are transformed in strategies of substitution, financial services, and household member negotiation. This approach will draw its data from a pilot study survey conducted in June 2007. The sustainable livelihoods approach is a people-centred, systematic methodology which provides a straight-forward sense of livelihood outcomes when technology is introduced into the lives of the disadvantaged. However, this singular one-time use within a poverty profile fails to account for the dynamic nature of the poor: how the poor can move in and out of poverty across time and the differences in inflation. Nevertheless, the sustainable livelihoods approach is best used for observing impact of mobile phones in this project because the framework is simple to follow and is becoming well practiced around the world. It is envisaged that the PICTURE Africa survey will employ other poverty measuring approaches during their study.

1.5 The Case Study in rural Uganda

This project analyses the changing expenditure patterns within households influenced by mobile phones, and draws out possible conclusions on individual and household poverty level changes. The research uses the qualitative results from a pilot study in Katote, Uganda, undertaken in June 2007, where several qualitative methods were applied: a) ethnographic observation (including staying with a family in their village), b) key informant interviews (ex. airtime re-sellers, mobile phone repair), c) 6 mobile phone diaries, d) 6 interviews to households and, e) 3 focus group discussions with men and women from poor households in rural settings. Selection of location was purposive and was chosen with the help of a field research assistant and the Network of Ugandan Research and Research Users (NURRU), a group of researchers familiar with field work in Uganda. Katote village in the Wakiso district

twenty-five kilometres from the capital city, Kampala, was chosen using the following criteria: rural but accessible by local taxi or bicycle to nearby town, mobile phone connectivity, safety, and ability to stay with a household home for the duration of the study.

The researcher transcribed taped interviews, cleaned up data, coded the transcripts and processed the data through an open source qualitative tool called TAMS Analyser using case study analysis. This is a pilot study which will then be followed by more comprehensive ICT focus group discussions for PICTURE Africa's future qualitative work. The analysis of this data for this dissertation will explore the changes of expenditure patterns of households, and whether any changes have led to changes of well-being levels using before and after analysis. The study analysis attempts also to examine the opportunity costs that households are prepared to forgo in order to acquire a mobile phone as part of their livelihood strategy.

1.6 Thesis Structure

A literature review on the conceptual framework of ICTs and poverty as well as the socio-economic impacts of mobile phones are covered under Chapter 2. Chapter 3 follows with the institutional structure and process of ICTs in the case study location, Uganda. This includes a historical overview of the country's pro-poor telecommunication policy particularly leading to the regulation on universal access. This follows in Chapter 4 with the methodology, data collection tools, and data analysis used for the case study. Chapter 5 reveals the findings from the analysis and covers possible limitations of the data. Lastly, Chapter 6 draws an analysis and summary of the study thereby concluding the case of mobile phone and spending behaviour in Katote village, Wakiso District, Uganda.

Chapter 2: Literature Review

This literature review briefly describes the current conceptual framework research on information and communication technology for development (ICT4D). The section then follows with the chosen approach for this study analysis, the sustainable livelihoods framework. The current literature on livelihood strategies like the spending behaviour and patterns in Africa and other regions with particularly emphasis on substitution, financial services provision and intra-household asset negotiation are then noted. This literature review concludes with further need for research on conceptual framework development and research on mobile phone impacts particularly in Africa.

2.1 Conceptualising Mobile Phone and Technology Impacts

Mobile phone impacts in developing countries, while limited in study, have been tackled in several framework forms. Productivity and mobile phone use by small and medium enterprises (SME) have applied the approach of value chain analysis to examine how the mobile phone has upgraded communication throughout the chain of production activity (Jagun *et al.*, 2007). Current work on theory development in ICT4D also includes the application of the sustainable livelihood framework (SLF) (Duncombe, 2006; Albu & Scott, 2001; Chapman *et al.* 2001). Akpan-Obong (2007) investigates a case of ICTs in Nigeria through a contextualist and structuralist analyses, which appears to hold similar characteristics as the livelihoods framework. These studies are very interesting avenues for investigation and help to mold the theoretical framework of this Ugandan case study. Of all the analysis frameworks, the SLF is an ideal framework to specifically investigate the changing substitution patterns for mobile phone use. The SLF not only looks at the direct changes of household livelihoods, but examines other factors such as institutions and family assets that have also influenced the household's movements. The objective of this section is to justify the use of the sustainable livelihoods framework particularly for examining this literature and case study on mobile phone spending in rural Uganda.

2.2 General Concept of Sustainable Livelihoods Framework

The sustainable livelihoods framework (SLF) is a theoretical framework used to examine a household's overall environment and how this environment influences household-level strategies and outcomes in a vulnerability context. The framework allows for the analysis of linkages between the micro-level actions and macro-level policy (Department for International Development or DfID), 2005). The SLF argues that the mix of household assets and institutional structures and processes shape the vital course of action taken to support a household's livelihood. Through the SLF, researchers identify with holistic analysis processes when trying to integrate all the various factors affecting the rural lives of citizens. The sustainable livelihoods framework is an effort to look beyond development as a simple measure of goods production, unemployment levels and income generation (Chambers & Conway, 1991: 2). 'Livelihood' is essentially "...a means of securing a living..." (Chambers & Conway, 1991: 6). Conceptually, a livelihood incorporates several development concepts (capability, equity and sustainability) and is summed up in Chambers & Conway's definition (1991: 6):

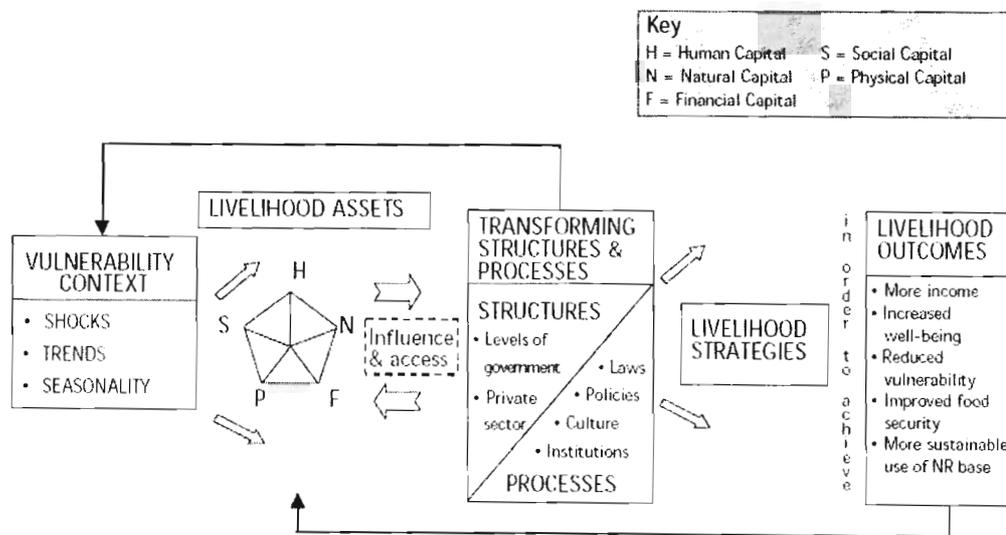
"a livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term".

As such, analysis asks the researcher to bring people to the centre of their study and to reflect on the multiple component processes which have guided the development of the households and their communities. By using the SLF, one can better understand the current overall state of the household, and the influences that affect their current circumstances. In application to the example case of mobile phones in Uganda, one must understand the current state of the mobile phone industry in Uganda, its respective state policy and regulations and how it is affecting the lives of the citizens. The sustainable livelihoods framework can show how a developing country with a

pro-poor policy on communication access is linked to the effects of mobile phone spending and access of its rural citizens and vice versa.

Much of the existing socio-economic literature on the sustainable livelihoods framework and technology attempts to address the livelihoods of the rural disadvantaged. Several institutions, such as the Department for International Development, United Kingdom, and the University of Sussex, are championing further development of the framework (DfID, 2005; Livelihoods Connect, 2007). Other institutions have attempted to adapt their SLF version according to their mission and objectives such as the Food and Agriculture Organization (FAO) and CARE (Hussein, 2002). This study will utilise the sustainable livelihoods framework adopted by DfID as it is felt that this best reflects Chamber and Conway's sustainable livelihoods definition in a clear and coherent manner.

Figure 2.1: Sustainable livelihoods framework



Source: DFID, 2005

2.3 Sustainable Livelihood Framework Components

The following section describes the sustainable livelihoods framework components as derived from the DfID model (2005). As seen in Figure 2.1, this DfID sustainable livelihoods framework applies to a vulnerable context, a context most relevant to cases of the rural poor or disadvantaged peoples. The rural poor struggle to cope with the external environment or unpredicted shocks that destabilise their

security. These adversities can range from poor weather, political unrest, market changes, other erratic agricultural factors and, in the case of Uganda and many other countries in Africa, war. The vulnerability context then shapes the SLF which is made up of the following components: a) livelihoods assets, b) policy, institution and process, c) livelihood strategies, and d) livelihood outcomes.

2.3.1 Livelihood Assets (Capital)

Within the vulnerability context, the SLF has identified five main livelihoods assets: human capital, social capital, natural capital, financial capital, and physical capital. The Ford Foundation further describes assets as stock "...that can be acquired, developed, improved and transferred across generations. It generates flows or consumption, as well as additional stock" (cited in Moser, 2007: 84). While obvious assets are tangible assets, Amartya Sen's capabilities approach also includes intangible skills and capabilities (human and social assets) to transform assets into useful resources (Sen, 1999). Physical assets or capital can range from land, houses and other durable products like bicycles and televisions. Human capital mainly applies to intangible labour skills, education levels and health. Financial capital can include access to loans and savings programs, income generation and remittances. Natural capital is the environmental indicators of land, habitat and animals available to families. Lastly, social capital is seen as the intangible groups (church, sport teams, political party), connections and trust built within families. This study takes stock of all these livelihood assets that a household may have at one point in time. Figure 2.2 gives May's (2007) prime example of an asset portfolio and the different indicators which fall under each capital asset category.

Figure 2.2: Asset Map



Source: May, 2007

The sum of the household's assets is the overall view of household strengths, which will either assist or hinder the strategies and outcomes of maintaining the lives of the vulnerable. This can be contrasted with a conventional income poverty definition which usually compares the financial capital: household's income or consumption level, to either the dollar a day poverty line or a national poverty line. Poverty alleviation is, thus limited to an improved income generating strategy. However, such poverty measurement may find an asset-rich but income-poor family as well-off because they utilise all funds and resources to cultivate their strong base of assets. In a case study from Ecuador, Moser follows households for twenty-six years and measures both income levels and assets (through an asset index) and conveys the idea that the accumulation of assets over time is a way out of poverty (Moser, 2007: 16). Household assets also accumulate over generations and see households improve over time with their growing household asset portfolio. Poverty measured through assets can better explain how and why certain families move in and out of asset poverty over time. With a portfolio of assets, one can see certain assets traded off or sacrificed in order to fulfill the demand for another asset. These asset portfolio changes are the substitution choices or exchanges made by the household in hopes of making their lives more effective and efficient. In the context of technology, Barrantes (2005) introduces the asset factors that lead to digital poverty. Digital poverty attempts to identify a minimum quantity of ICT asset use and consumption levels given a certain

population's income (Barrantes, 2005: 33). In order to be identified as the digitally poor, one must examine the human capital (ability to make use of ICTs and ICT literacy), physical capital (telecommunications infrastructure services availability) and financial capital (income level). For example, an extremely digitally poor person may only afford a radio, have no mobile phone reception, and be illiterate. A digitally "wealthy" home may have full access to internet, contributes to the web with content, utilize mobile phone services regularly and use government's digitally provided services. These individuals are able to use these ICT assets to improve their livelihoods.

2.3.2 Policy, Institutions and Processes

Influencing the use and accumulation of assets are the policy, institutions and processes that bring context to households and their situations. Again these external factors either help or hinder the strategies undertaken by the family to remain resilient throughout their livelihoods. The measurement and indicators of these policy and institutional changes to the extent of livelihood improvements would help to monitor and evaluate policy effectiveness. The case study utilised in this research outlines the policy and processes of Uganda's communications environment in Chapter 3.

2.3.3 Livelihoods Strategies

Livelihood strategies are the next step in the process of analysing the behaviours and patterns developed in order to carry on a manageable household life. Strategies include techniques to stretch their limited budget and use of financial services savings programs. One option is asset substitution which means spending income on new expenses like mobile phone airtime credit to replace other expenses like food or time-consuming activities like travel. Strategies are constantly exploited to find the optimal action which improves the well-being of the household.

Substitutions can be measured by the cross elasticity of demand. Cross elasticity of demand "measures the responsiveness of the quantity demand of a good to a change in the price of another good" (Wikipedia, 2007). For example, if the price of airtime cards increases by 20%, the demand for store bought food may go down. Such an example means that the two goods or services are complements as one is needed for the other. If, on the other hand, one price increases and the quantity

of goods increases (positive cross elasticity of demand), this example is a substitute. Gaspar and Glaeser (1998, cited in Panayides & Kern, 2005: 167) suggest that the more use and spending on electronic devices means that more face-to-face meetings were to occur particularly in cities. Of course, this example may find different results in inaccessible, rural areas. This study will investigate the spending strategies undertaken by a household including substitution, in order to maintain mobile phone needs and their livelihoods.

2.3.4 Livelihoods Outcomes

Lastly, livelihood outcomes are the results of the strategies. As the main objective for households is to seek a sustainable livelihood, the outcome looks at the extent to which the household has achieved this objective. The livelihood outcome can result in support or hindrance of further livelihood assets accumulation for the family or changes in health or human development indicators. Some examples of outcomes include increases of income or improved health care. As one can see, the livelihoods framework is fluid and provides an overall impression of poverty analysis from a rural and vulnerable context.

The main limitation of the sustainable livelihoods framework is that the large number of components can make for a sizeable analysis and detail which can only be applicable to certain contexts. While the SLF provides an overall picture of a study, Parkinson (2007: 5) also finds analysis requires lots of effective time use for such difficult evaluation which may or may not end with any definitive results. Despite the limitation, the sustainable livelihoods framework has helped to improve the overall perception of rural poverty through a people-centred approach.

2.4 Previous Applications of the Sustainable Livelihoods Framework

Several examples of the SLF have been applied to information & communication technology for development (ICT4D) studies. The most recent application of SLF is Duncombe's (2006) case study on ICT applications by microentrepreneurs from Botswana. While this case study attempted to utilise the livelihoods framework, the case itself left out the livelihood outcomes component and

failed to convincingly link the specific assets and policy to the resulting strategies and outcomes undertaken by Botswana citizens. Instead, Duncombe attempted to describe the livelihood strategies which microentrepreneurs can potentially consider with information-handling technologies in the future. He does suggest that rural households are in much need of building what assets they already have and therefore new information access should be a secondary concern. Another SME study conducted by Albu and Scott (2001) suggests the SLF framework has not emphasised the market structures and processes and adds a meso-level to the linkages between policy and household micro-level actions. Secondly, Albu and Scott's case study suggests the inclusion of another capital asset called technological capabilities within the SLF. This asset incorporates the choices and local adaptability of new technology and its processes towards new and innovative methods (Albu & Scott, 2001: 13). The addition of a technological capability asset would be welcomed particularly for ICT evaluation, however, further work must clarify the overlap between technological capabilities and the already existing assets like physical assets (ex. mobile phone or computer) and human assets (ex. computer skills). While the paper suggests enhanced components of technology and meso-level analysis the SLF, the study does not go into the actual application of the framework. Chapman *et al.* (2001: 4) attempt to revise the livelihoods assets component by adding two information layers around and within assets component, which support and enhance the assets in the long and short term. Information is delegated the role of improving long-term capacity building (outer layer consists of i.e. supporting human assets like education or training) as well as of informing short-term everyday activities (inner layer) in a participatory context. In their example of an Indonesian Farmer Field School, Chapman *et al.* discuss how the information-supported SLF model could start to pinpoint direct advice to the poor or improve the current conditions and amount of community agricultural information to local institutions (Chapman *et al.*, 2001: 5). This dissertation hopes to provide a concrete application of the sustainable livelihoods framework with emphasis on the strong linkages between livelihood assets, policy, strategies and outcomes from an ICT-enabled but vulnerable rural household context.

The sustainability livelihoods framework influences this study's qualitative methods selection. The ethnographic observation (living with the household and

village)² included key informant interviews, informal conversations and focus group discussions for one week to assess the “Transformation Structure and Process” within the rural community. The week looked at the village telecommunications infrastructure, political leadership and the market in order to get a sense of the factors influencing mobile phone purchase. This week was followed with the household interviews, which formulated responses that described much of the rural “Livelihood Strategies”. The analysis of household responses to the impact of mobile phone spending falls under the “Livelihood Outcome”.

In summary, the sustainable livelihoods framework can be an appropriate structure to examine ICT4D projects. SLF attempts to convey an overall observation and analysis of human development particularly with regards to well-being. Uganda, with its pro-poor universal service and access policies, can make a good case, which incorporates the sustainable livelihoods framework. The Uganda government is adopting telecommunication policy and regulators in order to address affordability and access. While the assets, strategies and outcomes are from the household level, these components of the SLF are strongly influenced by this environment (policy, infrastructure, institutions) in which they operate. This leads to better understanding of the linkages of macro-level activities to micro household level activities. The degree to which rural homes succeed in this knowledge economy can be better analysed and make concrete strategy adjustments in order to improve that communication gap. The sustainable livelihoods framework clarifies the link between poverty and communication access and provides justification for an universal access policy and interventions which aim to assist the disadvantaged.

2.5 Literature Review: Mobile Phone and Livelihoods

There is some previous research conducted which investigate the effects of the technology on poverty. While mobile phone research has attempted to link outcomes to economic development, this section will draw on mobile phone studies that specifically concentrate of well-being and poverty. Skuse and Cousins’ study in the Eastern Cape, South Africa, finds that rural shops would price individual calls at a

² I have referred to my ethnographic observations as “deep hanging-out”.

higher rate than those in urban areas. The higher cost allows the shop located in a low-populated area to remain viable (Skuse & Cousins, 2007: 195). The higher call costs, however, make telephony expenses for the rural poor higher than the urban poor in meeting similar communication needs. Their findings also suggest that while telecommunications help to ease shocks within households, the poorest citizens have limited access (Skuse & Cousins, 2007: 202). The poor are constantly under the pressure of resource constraints, which hinder opportunity and limit choices. Given the financial, skill, and resource constraints, various strategies by rural communities are implemented to cope with difficulties, whilst at the same time maintaining valuable technology (McKemey *et al.*, 2007). Such cost mitigation strategies from vulnerable shocks include the calls that are made to family and guests for funeral preparations, what Slater and Kwami termed 'funeral traffic' (2005: 11). The mobile phone minimises the cost to travel to communicate with out-of-town relatives. The use of the mobile helps to facilitate the planning and coordination for travel and events. The village phone study (Bayes *et al.*, 1999) observes that individuals were able to rapidly communicate with worried family members during flood disasters. The poor have proved to be successful in mitigating shocks and costs through use of the mobile phone. Another perspective of poverty impacts is looking at how improved communications have contributed to more efficient and timely remittance distribution (Oestmann, 2003; cited in Donner 2007a). This literature review explores studies that link between mobile phones and poverty level changes particularly on livelihoods.

2.5.1 Why Mobile Phones?

Mobile phones are a major focus in some information & communication for development (ICT4D) programs because of their phenomenal uptake by developing areas such as Africa. The reasons for such diffusion and acceptance of the technology were complemented with mobile telephony liberalisation through the incorporation of the following factors: a) lower barriers of entry (eg. cost & skill), b) convenience, and c) innovative products catered to the lower income market. Akpan-Obong, (2007: 16) finds that mobile phones are a simple entry pathway to technology for the poor because the mobile phone does not require a high literacy level. Mobile phone handsets have also come down dramatically in price. In 2007, the 60,000 UGX (\$40

USD) for a new mobile phone handset (UCC, 2007: 13) and 3000 UGX (\$1.80 USD) for a connection sim card package was the cheapest cost for a new mobile phone connection in Uganda. A robust informal market of second-hand mobile phones is also allowing communication to be affordable. The trend towards lower cost mobile phone handsets appears to be improving mobile phone access and affordability for households in Uganda. The low 'sunk cost' of the handset, the minimum expenses for receiving calls and the need for little literacy training usually make the mobile phone a home's first technology item.

2.5.2 Mobile Phones and Economic Development Literature

The presence of evidence and academic literature on the economic development through technology like mobile phones helps to shape today's policy framework in the telecommunication environment. Particularly, there is a growth spurt of literature relating to the field of mobile phone diffusion and its impact on the livelihoods of the disadvantaged. The current mobile phone literature relating to development primarily focuses upon the usage of the phone (Donner, 2007a; Souter *et al.*, 2005; Zainudeen *et al.*, 2005), micro-enterprise productivity changes (Bayes *et al.*, 1999; Jensen, 2005) and the sociology of mobile phones (Castells *et al.*, 2006, cited in Donner, 2007a). For a comprehensive insight into a multi-disciplinary range of academic publications on mobile phones in developing countries, see Donner's (2007a) literature review. Since this study concentrates upon impact spending changes of mobiles upon households, the following review of the literature will draw upon more specific mobile phone studies in economic development and poverty level effects.

Mobile phones are used as an enabling tool for countries and individuals to develop their economic potential. Previous work on mobile phones and economic development can be divided into two distinct areas: the macro-level and micro-level studies. Under the macro level studies, researchers attempt to evaluate whether mobile phone penetration was improving economic development through rise in GDP (Waverman *et al.*, 2005) or through increases in foreign direct investment (Williams, 2005). Thompson and Garbacz's (2007) study suggests a model, which displays productive efficiency effects from telecommunications use.

As for micro-level economic development, a few case studies explore the micro-level effects of the mobile phone on productivity (particularly with small and medium enterprises) and income in developing countries. Bayes *et al.* (1999) evaluates the successful mobile phone leasing program (otherwise known as the Grameen Village Phones) for women in Bangladesh. Jensen (2005) and Abraham (2006) look at case studies of fisherman's mobile phone use in Kerala, India. Both studies found that the improvement of information transfer transform into increased profits for fishermen. Chowdhury (2006) counters the argument that mobile phone impact studies on small and medium enterprises (SMEs) are problematic as it is difficult to calculate growth and production as a result of the mobile phone. Donner (2006) and Souter *et al.* (2005) also report greater personal use of the mobile phone than for business or production use. Such a mix of business and personal use would make it difficult to determine the true SME productive impact of mobile phones. Several economic development studies, at both the micro and macro level, have attempted to explain the impact of mobile phones.

The reduction of call costs and sim cards is the result of strong competition and profitable growth in the mobile phone industry, particularly, in Uganda's case, of three mobile phone operators (and a possible fourth operator). With such competition, telecom firms are addressing the market needs of their clients through product differentiation. Many of the new and improved services are attempts to meet the growing needs of the majority: the low-income customer. Mobile phone airtime services include the prepaid 'pay-as-you-go' model which allows the user to control the amount of purchased airtime. Calls received on a handset in Uganda are free. Smaller, "micro" denominations of pre-paid airtime cards have made airtime purchases easier for low-income clients who may only hold small amounts of cash at any one time. Public phone operators also advertise their rates per minute on their kiosks or shops, which allows customers to shop around for the lowest price. As seen in Table 3.1, the three mobile phone operators attempt to have relatively competitive rates according to certain peak or non-peak hours allowing customers to choose a rate which best meet his or her usage needs.

Table 3.1: Mobile Prepaid Pricing: Uganda

Mobile (Prepaid) Pricing: Local Uganda & US Currency (31 July 2006)						
Call type and duration	MTN (UGX)	MTN (USD\$)	UTL (UGX)	UTL (USD\$)	CelTel (UGX)	CelTel (USD\$)
3 minute off-peak to same network	663	\$0.40	660	\$0.40	720	\$0.44
3 minute peak to same network	1,307	\$0.79	1200	\$0.73	1350	\$0.82
3 minute off-peak to different network	878	\$0.53	1260	\$0.76	1050	\$0.64
3 minute peak to different network	1,502	\$0.91	1500	\$0.91	1560	\$0.95
3 minute off-peak to fixed line	663	\$0.40	660	\$0.40	720	\$0.44
3 minute peak to fixed line	1,502	\$0.91	990	\$0.60	1560	\$0.95

Source: RIA! SME e-Access Survey, 2006

Some households use a ‘flashing’ (or beeping) function as a savings strategy; the caller gets the receiver on the phone line to call back once a free ‘flash’ is sent (Donner, 2007b). Service providers retain customer loyalty running competitions or offering incentives like free allocated airtime or SMS bundles when callers fulfill a condition such as long duration calls. Regulations have forced operators to allow callers to switch service plans while retaining their original handset numbers. Customers used to feel restricted to an operator and its phone plans when he or she could not use the same number for another service provider. The provision for phone users to keep their existing numbers again drives competition for customer retention. One service innovation is airtime credit transfer from one mobile user to another. For example, a user can purchase a 4000 UGX (\$2.42 USD) airtime voucher, and then transfer or resell 2000 UGX (\$1.21 USD) of his or her credit to another phone user. Besides airtime credit transfers, there is also interest in mobile phone value-added services like money transfers through mobile phones. While not in place in Uganda, neighboring Kenya initiated M-Pesa, a mobile phone money transfer in 2007 (Safaricom, 2007). M-Pesa is a SMS money transfer program which has established cash points throughout the country. A population reluctant to open bank accounts or who live in distant rural areas could now access cash from the M-Pesa cash points. Business opportunities from reselling phone cards, providing public call box services, phone repairs and charging are emerging throughout cities and villages; this is a major network effect of mobile phone diffusion. The convenience, low-cost for adoption and new innovative marketing strategies are making mobile phones a technology

easily accepted by low-income households. The engagement of strong competition in Uganda within mobile phone services benefit Ugandan citizens in terms of greater choice, lower costs and increased economic activity as well as new business prospects for small and medium-sized businesses. Given the above factors that have contributed to the rapid spread of mobile phones, one can start to investigate the social impacts of this technology. The social impacts such as spending behaviour can lead to improved, targeted policy and programs for the disadvantaged in rural communities.

2.6 Spending Behaviour Literature

Consumers behave according to the aforementioned constraints or enabling factors, which range from governmental policy decision, a company's marketing decision to a community's cultural beliefs. Milne looks at the constraints through the 'barrier' and 'inhibitor' effect: a) the barriers from owning a phone and b) the inhibitors which prevent people from calling as much as one requires (Milne, 2006: 3). The impacts of the constraints or, more specifically, the spending behaviors or patterns that emerge are rarely documented in developing countries. Such studies would produce evidence to support universal access, consumer protection and the progression of the ICT4D debate. Publications on telecom spending by households and consumer behaviour in East Africa are limited.

2.6.1 Budget Proportions

In the search for consumer spending literature on mobile phones and mobile phone services, one finds that few African country studies have explored the area of substitutions choices and budget proportion decisions. How are expenses divided within a household's budget and how are mobile phones competing with other budgeted household expenditures? This review looks at research on consumer spending from parts of Africa and the developing world. Household expenditure studies are popular topics of research and have led to many studies in South Africa (Milne, 2006, Maliwichi *et al.*, 2003: 227; Ureta, 2005). Milne (2006) describes several methods of evaluating affordability, including a study of household expenditure and particularly those with communication budget lines. Using ITU

statistics, Milne finds that those countries with telecommunication densities of 80% or more tended to spend around 2.5 % of their consumption budget on communications (Milne, 2006: 7). The RIA! “Towards an Africa e-Index” study, which was conducted in several African countries, suggests that Africans were more likely to spend a larger proportion (10%) of their expenditure budget on ICTs than the average (2 - 3%) of those in the developed world (Gillwald, 2005: 13). Milne explains this difference in expenditure proportions through a low representation of low-income households in the demand survey and that household expenditure surveys are better estimates of communication expenses (Milne, 2006: 12). African countries have larger household budgets allocated to ICTs since most of these nation states have not reached a telecommunication density of even close to 80 %. Several multi-country studies attempt to derive aggregate budget proportions allocated to communications.

There are other country case studies that examine expenditure proportions. Uganda’s most recent 2006 household survey (Table 3.2) finds the majority of the expenditure budget is still devoted to food. In terms of communication, the survey finds that 6 % of a rural budget goes towards transport and communication while urban budgets dedicate at least 10 % to this area. In 2005/06, the average household monthly expenditure was 152,068 UGX (\$ 92.20 USD) or 39,829 UGX (\$24.20 USD) mean consumption per capita (UBOS, 2006: 55).

Table 3.2: Share of Uganda Household Expenditure by Item Groups (%)

Item Group	2002/03			2005/06		
	Rural	Urban	Uganda	Rural	Urban	Uganda
Food, drink & tobacco	50	33	44	50	34	45
Clothing & footwear	4	5	4	4	4	4
Rent, fuel & energy	17	23	19	15	20	16
Household & personal goods	7	7	7	5	6	5
Transport & communications	6	12	8	6	10	7
Education	6	10	7	8	13	10
Health	5	3	4	8	4	7
Other consumption	2	3	2	2	4	3
Non-consumption expenditure	3	5	3	3	5	4
TOTAL	100	100	100	100	100	100

Source: UBOS, 2006: Uganda National Household Survey 2005/06

From Skuse and Cousins' survey of fifty poor village households in the Mount Frere district, South Africa, the average household each spends R26 (US\$4.17) per month on telecommunications (calls made) (Skuse & Cousins, 2007: 19). With monthly household incomes at as low as R200 (US\$32), telecommunication constitutes a considerable proportion of monthly household income. Samuel *et al.* also finds 10 to 15 % of income was spent on mobile phones usage in South Africa (Samuel *et al.*, 2005: 47). Donner's (2006) exploration in Rwanda compares the Gross National Income (GNI) to the cost of a used handset and airtime, amounting to 35% of a person's GNI. In another study conducted in Chile, de Melo observes that the poorest 20% of households were willing to "spend 2-3 % of income on communications" (1999, cited in Kenny, 2002: 144). Banerjee and Duflo's 2006 multi-country study suggests that when little was spent on festival outings by their rural segment, a greater percentage owned radio or television and vice versa (2006: 5). The study also finds that poor households would not spend more in food budgets even when they had the ability to do so; some preferred to save money for use in other entertainment expenses (Banerjee & Duflo, 2006: 21). In an analysis of South Africa's 2000 Income and Expenditure Survey, Burger *et al.*, (2004) look at different consumption patterns among various race groups in the country. They find that 0.46 % of expenditures are spent on private phone calls by black citizens while citizens of coloured, Indian and white background complete private phone call expense proportions between 1.09 – 1.46 % (Burger *et al.*, 2004: 25). The study does not specify expenses on communication devices. Further research could identify whether mobile phones became substitutes for other household expenditures. With ICTs becoming more available to households, this study could explore across time how the proportion of budget dedicated to communication could change, and whether changes in expenses for food, alcohol or festivals would also show substantive results. The e-Access survey does mention that the consumer's dedicated income to communication becomes an important factor to greater penetration of ICTs (Gillwald, 2005: 14). Income available at the time when communication is needed will also influence spending (Gillwald, 2005: 18). More individual case studies suggest that developing countries spend greater proportions of their budget dedicated to telecommunications compared to the proportional average in developed countries or in the ITU studies.

2.6.2 Technology Spending Influences

A household's socio-economic background, values and lifestyle can also have major implications on the stages of choice and decisions on ICTs. Traditional marketing concepts state that the process of spending usually occurs in five distinct stages: "need → information search → evaluation of alternatives → purchase → post purchase evaluation" (Karjaluoto *et al.*, 2005: 63). In the initial stages, people regardless of economic background, will undertake a basic information search on their need and whether alternatives to these preferences are feasible (Karjaluoto *et al.*, 2005: 63). Most decisions are made with fairly limited information searches on both preferences and alternatives (Karjaluoto *et al.*, 2005: 64). During the information searching stage, the socio-economic background of a household can affect the extent of one's information search; and therefore, affect one's final purchasing decision. For example, wealthy families may afford better access to information (internet, television, radio, or mobile phone) that others may have missed if one only has enough money for survival. Another example of limited information is illiteracy, which impedes individuals from receiving the best information of prices on cell phone equipment and services. The limits of information searching for a household due to their socio-economic background can influence whether the final purchase decision is reached.

In terms of behaviour, East African market segments may react to spending in different ways. While few studies in East Africa are available, the study of how countries address market segment spending can provide for a good baseline study. In terms of social status, an American study from the 1950s showed that low-income households place emphasis on symbols of "upward movement" in items such as clothes and cars while less investment goes to pricy household appliances and property (Martineau, 1958: 126). In the low-income segment, more importance is placed on products as symbols and on the accumulation of objects instead of savings (Martineau, 1958: 51). The satisfaction of needs through product purchase is seen differently depending on market segments. In South Africa, for example, one newspaper has gone so far as to identify the "up and coming" black middle class as the booming "buppie" class, a group that spend substantial proportion of household budget on goods and clothing for status (SouthAfrica.info, 2004). Batt and Katz' American study indicate that in general, young people, and those with "positive

attitudes towards technology” were likely to adopt ICTs. This suggests that ICT adoption has less to do about income than status and attitude. (Batt & Katz, 1998: 42). In this same study, income spent on expensive goods like mobile phone service (Batt & Katz, 1998: 44) is the exception. The question also remains as to whether there is diversity of budget manipulation among different market segments in East Africa. Is there a great disparity between demographic groups when purchasing of mobile phones and mobile phone services? Such information can assist policy makers on whether to consider targeted initiatives if the spending is convincingly diverse between, say, the rich and poor. The value of ICTs is dependent upon several factors, including socio-demographics and geography. Spending among populations is not homogeneous; each socio-economic group has patterns of spending, which differ from one another. Few studies have explored the extent of this diversity in each East African socio-economic group’s approach to spending on ICTs.

In African culture, the question remains as to whether kinships or informal relationships are threatened or strengthened by information access through the internet or mobile phone. One study states kinships meant that certain head individuals or clans had control or access to local community knowledge and the community’s submissiveness to such knowledge put him or her in the position of power (van Binsbergen, 2003: 134). As mobile phones provide access to knowledge outside of tribes and clans, the breakdown of traditional authority within the tribal hierarchies are called into question. How will the mobile phone change that chief’s control of knowledge and rule? However, much of Africa is also made up of collective societies where groups and extended families are of great importance. Mobile phones can further solidify the relevance of this connected community in such a way to “cultivate and operate simultaneously many contacts” (van Bingbergen, 2003: 140). Mobile phones meet and satisfy the cultural context of collectivism and this cultural meaning and social need can further provide motivation for families to purchase a mobile phone. The strong cultural value of communication in a collective society, particularly in East Africa, can have strong value implications on the growing market of ICTs. The aforementioned factors “...explain why people may make do without necessities in order to afford luxuries” (Gabriel & Lang, 1995: 50). Regardless of one’s income, the magnitude of staying in touch because of one’s cultural values can justify costs, which facilitates a household’s adoption of mobile phones.

The question remains how these high budget proportion of low income families affect other budget proportions essential to the home such as food, education, health care, and housing. These budget proportion studies provide clear evidence to ignite policy debate on essential service delivery to the poor.

2.6.2 Substitutions

Another approach for exploring mobile phone spending behaviour is to examine substitution choices made in order to obtain a certain good or service. Economists have referred to opportunity costs, or the costs which one is willing to forgo for another goods item. One starts to weigh out individual preferences; in other words, examine one item value or service against another. Milne suggests that "...buying more of one good and less of another is seen as an expression of preference, rather than a reflection of the feasibility of meeting basic needs" (Milne, 2006: 2). Nevertheless these preferential choices are behavioural changes which have rarely been studied, particularly with mobile phone and mobile phone service spending.

Of the developing country studies that mention substitutions made for mobile phones, the most common substitution response is travel (Duncombe & Heeks, 2001). Overa suggests that mobile phones were valued to substitute unproductive travel while certain face-to-face meetings were harder to replace with a phone call (cited in Heeks, 2007). Slater and Kwami's case study in Ghana also propose that the mobile phone substituted for time and unproductive travel (Slater & Kwami, 2005: 14). Jagun *et al.*, in their case study of the Nigerian weaving industry, list some unproductive travel examples such as traveling when no orders are secured, searching only to find out-of-stock product, and visiting out-of-town clients when they are away from home (2007: 15). The mobile phone call used for planning would replace long travel hours, inconveniences and costs (Kwami & Slater, 2005: 15). The phone call thus substitutes this uncertainty with clear, timely planning and efficient use of scarce resources. Besides time and money, the phone call also substitutes for travel risks (Jagun *et al.*, 2007: 4), which come with moving around developing areas with poor road conditions, little insurance from risks and rampant crime. Jagun *et al.* delivers an elaborate travel cost substitution (2007:15) in Nigeria:

"Time saved per call was typically several hours and overall this had meant that the turnaround time between first order and final fulfillment was reduced.

Money saved was typically understood by comparing call costs with transport costs: for example, interviewees talked about a call rate of N50 (\$0.40 USD) per minute being cheaper than a taxi cost for an average journey of, say, N1000 (\$8 USD) given that calls were normally completed in less than five minutes. There was some consideration of the opportunity costs of travel that could be recouped through use of the phone. For example, weavers could spend the time they would spend traveling on producing cloth; intermediaries could spend the time seeking orders or engaging in other business. There seemed to be little consideration of the capital cost of the mobile phone, which was regarded as a sunk cost.”

Another cost example of mobile phone substitution for physical movement includes how Coyle (2005) found a South African R15 (\$ 2.50 USD) bus journey could be substituted for a R5 (\$ 0.83 USD) mobile phone call. Other studies also mention the mobile being a replacement for physical movement (Bayes *et al.*, 1999: 23; State.gov, 2007: 1). Such exchanges offer considerable time and cost savings. Banerjee and Duflo from Massachusetts Institute of Technology (MIT) look at Living Standard Measurement Surveys (LSMS) in thirteen countries including three countries from Africa: Cote d'Ivoire, South Africa, and Tanzania. While the study briefly suggests the substitution of festival outing costs for ICT ownership, it lacked information on actual ICT spending (Banerjee & Duflo, 2006: 6). A certain amount of physical effort to attend an event or to catch transport is being replaced with a call through a mobile phone. Mobile phones have clearly substituted for other typical household expenses like travel, social outings and time waste.

Even between mobile phone features, substitutions of certain costly features (eg. regular phone calls) can compete with more innovative inexpensive features like SMS. Zainudeen *et al.* uses the study to test certain cost-saving strategies for communication with phones and found users would typically disconnect calls when costs meet their available income (Zainudeen *et al.*, 2006: 26). Several studies indicate that the use of missed calls (or flashing) and SMS make staying in contact with family members, clients and the rest of their social networks more affordable (Akpan-Obong, 2005: 16; Slater & Kwami, 2005: 10). The mobile is used to manage and reduce the heavy cost (in time, money, travel and hassle) of the obligations imposed on them by the relationships themselves. Even when mobile phones are used

as a substitute for other higher costs, users are still looking for the lowest cost service in delivering the same task.

Other studies have mentioned ICTs as substitutions or supplements to asymmetric markets and efficiency. Duncombe explains how informal information structures are supported by phone communications especially since these social networks can be a substitute for a developing country's lack of market infrastructure (Duncombe, 2006: 14). Duncombe also counters the argument of mobile phone substitutions by stating that, "...where ICT is used, it should provide a supplement to, not substitute for, existing information systems and technologies (Duncombe, 2006: 15). Heeks also supports the supplement statement as he sees 'incremental benefits' when mobile phones offer increased efficiency in communications than people experienced before. (Heeks, 2007: 1).

Outside of Africa, some studies exist in examining whether expenditure items were forgone for ICTs. In the British Medical Journal, researchers do not find a correlation between the ownership of cell phones by Finnish youth and a drop in smoking costs or habits (Koivusilta, *et al.*, 2003). Batt and Katz' 1998 American study indicate that "consumers are well aware of potential substitutions and are prepared to switch given savings or other advantages" (Batt & Katz, 1998: 40). As mobile phones become more available, studies may find manipulations of household budgets particularly for essential needs in accordance to the desire for mobile phones and services. Research on these specific mobile phone impacts or implications upon spending behaviours and substitutions by East Africans have yet to be seen.

2.6.3 ICT Spending and Financial Services

Financial services such as savings or loan programmes can impact upon a household's spending behaviour when used to assist with the purchase of the mobile phone or its respective services. In Uganda, Rwanda and Cameroon, the Village Phone initiative see women entrepreneurs use loans for the purchase of a business phone in their community (Grameen Foundation, 2007). Not only does the business phone address their need to communicate, but it also provides an income to their families. The money transfer via mobile phone mentioned earlier assists families in geographically dispersed populations where banks are non-existent or distant (The Economist, 2007: 67). The low cost of money transfers may be small, but could

possibly reveal a whole new income spending and behaviour. Lastly, spending patterns could uncover behaviour on mobile phone products or services that are currently not known to researchers themselves. Skuse and Cousins gives an example of how "...members of rotating credit schemes are often highly reliant upon each other for various resources from food, to small loans, to cellular phone access" (Skuse & Cousins, 2007: 198). The study of using a mobile phone to obtain remittances from relatives in the cities living abroad can answer the extent of usefulness of these products to families under geographical barriers. Further study in financial services and the consequential behaviour may assist to explain poverty impacts in Africa.

2.6.4 Intra-household Dynamics

Another factor on mobile phone consumer spending is how household purchase negotiations take place within the household. While a household's income level and culture can also affect the domestication of ICTs, this section will concentrate on the changing asset influences between members within a family. Within a household, certain members may be more influential in purchase decisions than others. While the income earner may have a certain amount of influence, other members such as children may construct their arguments or negotiations for mobile phones upon factors that reflect important family values. For example, in a Danish study, the researchers examine a child's ability to negotiate through the use of tactics such as listing situations where they would benefit from the additional safety that a mobile phone can provide (Ropke, 2003: 179). As for changes in women negotiation power, Bayes *et al.* study (1999) finds that decision-making within their sample of households of Grameen Village Phone owners are joint decisions. Secondly, in spending decisions of the earnings from the mobile phone business, while the majority (58 %) were joint decisions, 36 % were decided upon entirely by the woman's (Bayes *et al.*, 1999: 18). Slater and Kwami state that mobile phone ownership by women was decided through a 'legitimizing strategy' or "...a justification for having a phone or an excuse for not having a phone. The rhetoric is, again, a language of practicality, concrete relationships, and economic rationality" (Slater & Kwami, 2005: 12). Bayes *et al.* find Grameen Village Phone women perceived with empowerment for themselves and their households (Bayes *et al.*, 1999:

18). Skuse and Cousins realize that, in their rural study, remittances are mainly (93 % of respondents) handled by the women (Skuse & Cousins, 2007: 199). Even the fact that work migration by men is strong in South Africa's former homeland community, women have gained a new asset responsibility as a result. Huyer *et al.* (2005) in Francophone Africa makes note of how men perceived a collapse of marriages because of women mobile phone ownership (cited in Wanjira & Mureithi, 2006: 9). New social responsibilities from adopted technologies can affect the negotiations between partners and between children; yet the effects are still unclear as a result of limited studies within East Africa. The elderly is another vulnerable group which lack of research on ICT usage. Barrantes suggests that old age is a variable for the digitally poor because the elderly may not have gained the skills or literacy level necessary to use ICTs (Barrantes, 2005: 34). Their usage is found to either be non-existent or as passive receiver of information. The introduction of a mobile phone within a family brings dynamic changes in negotiation and the decision making process of assets.

ICT adoption within a family will more likely take place if the technology itself becomes part of the social or domestic process of the home through everyday "rituals and ceremonials" (Habib & Cornford, 2001: 135). Once the mobile phone passes the stage of being a new tool, the diffusion of the mobile phone will happen if it can be used everyday and if the tool molds as part of one's cultural values. For example, households that value security will find mobile phones for their traveling children as a way to mitigate worry for parents. Another example is the value of family cohesion for households with two working parents. The same Danish study interprets the following case study: as two parents must both work to keep up with the rising costs of raising children, relationships appear under threat from the family's fragmented lives (Ropke, 2003: 185). Therefore, mobile phones can create that virtual "family togetherness" since, with the device, families can always know each other's whereabouts and can help to coordinate activities in one another's lives. Mobile phones that develop a place in social process within a family will more likely see an increased budget allocation put towards its use.

2.7 Literature Review Conclusion

This literature review addresses the current conceptual framework research that has been conducted upon ICTs and mobile phone impacts on spending behaviour in Africa and beyond. More specifically, the chosen conceptual framework, the sustainable livelihoods approach, delivers a method to gain a full overview of the process of poverty and well-being. In the case of Uganda, the mobile phone industry, government institutions and assets will influence the strategies undertaken by households for an improvement in wealth and health. The literature review then examines the studies which currently exist on spending behaviours of the disadvantaged. Substitutions, financial service uptake and intra-household dynamics are some of the changes in spending behaviours which are impacted by the introduction of the mobile phone. With little literature found in ICT4D studies and mobile phones impacts in East Africa, the further analysis of ordinary people engaging with mobile phones is, therefore, a worthwhile study.

Chapter 3: Uganda Telecommunications

Since the study site of this case study is in Uganda, this chapter describes the institutional structures and processes that have led up to the country's current telecommunications environment. The section will begin with the telecommunications monopoly prior to 1997, the competition changes after the induction of the Uganda Communication Act, followed by the current growth and poverty reduction strategies and issues faced by government in ensuring universal access and affordable communications. This chapter justifies the reason to investigate the true impact of a country's progressive telecommunication policy on the well-being of rural Ugandan citizens.

3.1 Historic Background on Ugandan Telecommunications

3.1.1 Fixed Lines Telephony (1977-1997)

Previous literature has reported upon some of the history of telecommunications and policy development in Uganda (Stork & Esselaar, 2006; Tusubira *et al.*, 2003; Econ One Research, 2002). This historical overview attempts to show how Uganda's telecom reform has evolved alongside international development trends to its present pro-poor strategy. Prior to 1977, Ugandan telecommunications were dominated by fixed telephone lines provided through shared regional coverage in the following East Africa countries: Uganda, Kenya, and Tanzania. By 1977, the East African Economic Community decided to sever its collective partnerships and, as a result, the community divided all shared government assets between the three countries. Within telecommunications, the countries transformed from a joint East African phone company into each of their own respective state monopolies. In Uganda, the new monopoly became known as the Uganda Posts and Telecommunications Company (UPTC). Through these early years the high cost of installation and connection fees allowed only the elite few access to these lines. Not only were the costs unaffordable for the average family, but the parastatal was inefficient in delivering fixed line installation and service (Shirley *et al.*, 2002: 12). The majority of fixed line users were within the urban capital centre,

Kampala, and UPTC was unable to use its time efficiently as a monopoly to build and meet demands for communications to the Ugandan people (Shirley *et al.*, 2002: 9). Prior to the arrival of mobile phones in Uganda, the trend of building infrastructure and capacity through a parastatal fixed line monopoly proved to be a mismanaged affair. The country was unable to deliver the affordable and reliable services essential for the majority of the nation.

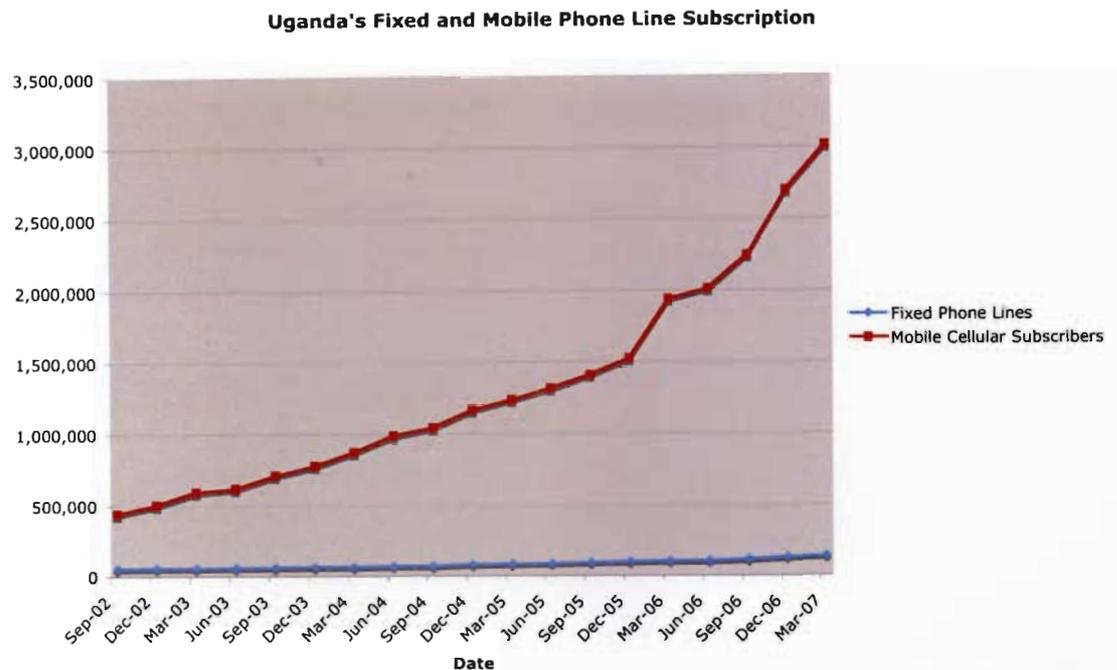
As of 1986, Uganda's telecommunication parastatal was one of several government-run institutions which were privatized; a trend that was occurring around the developing world at the time. The Ugandan president at the time, Yoweri Museveni, immediately set out an Economic Recovery Program (ERP), also known as the Structural Adjustment Program. Uganda agreed to rehabilitation projects funded by the World Bank (Shirley *et al.*, 2002: 10). One of the first policy decisions made by President Museveni was to privatize UPTC. Before the establishment of the telecommunications regulator, Uganda Communications Commission (UCC), the Privatization Unit chaired by the Ministry of Finance, was in charge of privatizing UPTC into Uganda Telecommunications Limited (Uganda Telecom). One of the major resentments of the privatization was the loss of formal employment by many public employees in the telecom sector. Nevertheless, such drastic changes hoped to see improved consumer price structures through lower costs and improved effectiveness in staff performance and customer service, an obvious need within the former parastatal. By 1997, the government rolled out its telecommunications policy, the Uganda Communication Act of 1997 (UCC, 1997), which opened up telecommunication competition within the country. Not only was Uganda Post created as its own separate entity, two telecom national operators were permitted in Uganda in 1997: Uganda Telecom and Mobile Telephone Network (MTN) (MoWHC, 2003: 15). The duopoly was an unusual occurrence in Africa at a time when most countries kept one telecom, private or state-run, as the sole competitor for fixed phone lines. Uganda moved in step with the international development agenda through its own structural adjustment decisions and eventually privatised several parastatals including fixed line telecommunications.

3.1.2 Mobile Telephony in Uganda (1998-2007)

Mobile phone telephony was also positively affected by privatisation and liberalisation policy, which continues to realise growth in a competitive market sector. Prior to 1997, mobile phone ownership only became available by 1995, and was not any more affordable than fixed phone lines for Ugandans. CelTel was the only private sector license for Global Positioning for Mobile (GSM) phone coverage from 1995-1997 (MoWHC, 2003: 16). Again, the single operator priced subscriber services as a luxury item leaving the very few to afford such technology and seeing little growth in mobile phone service (Shirley *et al.*, 2005: 24). The cost of the handsets, as well as connection fees, was exorbitantly high. A SIM card, at \$100 USD, and the high cost of airtime made regular phone calls almost completely unaffordable for an average income earner.

The Uganda Communication Act of 1997 changed CelTel's elitist marketing strategies and ensured competitive widespread coverage of telecommunications in the region through increased competition. Under this pro-growth strategy, the Act allowed new competitors into Uganda's mobile phone services sector. Mobile Telephone Network (MTN) became the second national operator for GSM mobile phone services in 1998. At the same time Uganda Telecommunications Limited (UTL) tendered and sold the majority of its shares in 2000 and joined MTN and CelTel as the third mobile phone operator (UCC, 2005c: 22). Both firms had won licenses as a result of their commitment to expand network coverage and basic mobile telecommunications services throughout Uganda. The result of increased competition today has delivered lower cost calls and new products such as micro pre-paid cards catered to low-income homes. Mobile phone companies are also providing Ugandan consumers with low-cost handsets. This has resulted in a growing number of Ugandan subscribers shown in Figure 3.1.

Figure 3.1: Uganda's Fixed and Mobile Phone Line Subscription



Source: Data derived from UCC, 2007

Figure 3.1 shows that mobile phone uptake has outnumbered fixed line subscribers in Uganda by several orders of magnitude only two years (1999) after introducing the Uganda Communications Act (UCC, 2007). While fixed lines do provide matching connection costs compared to mobile phones, the fixed line infrastructure requires costly installation and infrastructure not necessarily available in most of Uganda. Instead, the migrational nature of Ugandans and low start-up costs have made the mobile phone a preferable choice. The trend of liberalisation throughout Africa is particularly apparent in Uganda, where the country underwent privatisation and increased competition in the telecommunications sector.

3.2 Growth and Poverty Reduction Strategies

Pro-poor strategies particularly through telecommunication's universal access policies started to emerge after international institutions and developing countries identified certain structural reforms that were not necessarily improving the lives of the disadvantaged. What emerged at that time were country's Poverty Eradication Action Plan (PEAP), a paper that aimed at delivering pro-poor policies and addressed development goals such as universal education and health care within the country's

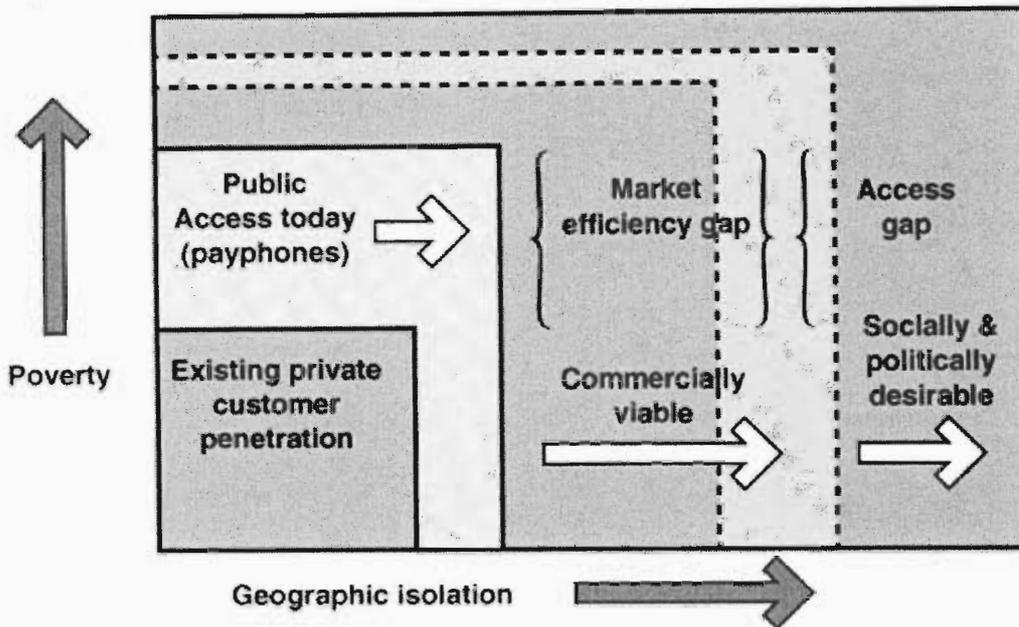
respective framework (IMF, 2005). Within Uganda's current 2005 PEAP, the paper does recommend that the Uganda Communications Commission continue its work in providing communication outreach to underserved rural areas, and that all government levels include budget lines for the ICT needs within their offices (IMF, 2005: 62). Communications, overall, was seen as an enabling tool for marketing and production for the poor within the PEAP, however no specific commitment to ICTs are made in PEAP. Although competition has dramatically lowered prices of mobile phones and its services in Uganda for the last decade, it was clear that these communication tools were still out of reach of the majority of the rural population: the penetration rate under 13 % (Oluka, 2007), and many rural families were still excluded from no or poor network connections. Developing country governments are faced with a constant challenge of designing policy, which encourages economic growth while, at the same time, improves the lives of the poor. A pro-growth, pro-poor strategy needs room for investors and infrastructure to develop in a competitive environment, while at the same time complement these strategies with the reduction of poverty.

3.2.1 Pro-Growth, Pro-Poor Telecommunication Policy: Uganda

Regulation and law help to facilitate availability and affordability of mobile phone services to its citizens and several policies and regulations have been employed in Uganda to address such terms. Under the constitution, freedom of expression (Article 29) and right of access to information (Article 41) are principles derived from the United Nations Declaration of Human Rights and lay the basis of universal access of telecommunications in Uganda (MoWHC, 2003: 9). It is also recognized that several regions in Uganda may not receive basic coverage because of the high costs and commercial impracticality of reaching isolated areas. As seen in Figure 3.2, UCC recognizes the gaps of access and market efficiency (2005a). In Uganda's current state, there is still a major gap of commercially viable consumers who wish to access and own a mobile phone, but have not been reached either due to marketing or long distance from shops. However, there is also the access gap for those who will not be able to afford service. The cost of connectivity for the firm is also commercially unviable. Such people and rural areas would require intervention by government to improve services for the disadvantaged. Uganda has attempted to address this gap

through improved rural outreach of communication through development of their Universal Access Policy.

Figure 3.2 The Market Efficiency and Access Gap



Source: UCC, 2005a

Ugandan regulation defines universal service as “a defined minimum set of services of specified quality which is available to all users independent of their geographical location, and in the light of specific national conditions, at an affordable price” (UCC, 2005b). In Uganda, universal access falls under the newly-formed Ministry of ICT under legislation titled, “Communications (Universal Service) Regulations, 2005”, with the objectives to (UCC, 2005b: 3-4):

- “ensure the availability to all persons in Uganda of good quality communication services”
- “define a set of communication services to which all users, including customers should have access at an affordable price in the context of universal service taking into account the prevailing economic and technological conditions;”
- “ensure universal provision of and access to quality and affordable basic communication services;”
- “promote widespread access to quality services at affordable rates and ensure that rural and high cost areas have access to communication and

information services at prices reasonably comparable with those offered in urban areas;”

- “secure the delivery of affordable and quality basic communication services to all persons in Uganda;”
- “expand and maintain the accessibility of affordable and quality communications services to all persons in Uganda;”
- “provide and maintain service to those who would not normally be served including, but not limited to, people in high cost service areas in rural and remote regions or lower income groups.”

In the case of Uganda, the Uganda Communications Commission (UCC) is the independent regulatory authority for the communications industry in Uganda. This institution will see that the above universal service objectives are provided in Uganda. Developed under the Uganda Communication Act of 1997, the UCC’s role is to license and regulate telecommunications, radio-communication and postal/courier services in Uganda (UCC, 1997: 9-10). The telecommunication firms must abide by the Ministry of Works, Housing and Communications’ (MoWHC) National Information and Communication Technology Policy Framework (MoWHC, 2003) regulated by UCC, and ideally, UCC would allow citizens to report or comment on service delivery by telecommunications firms.

Uganda’s commitment to expanding telecommunications into rural areas has been progressing since initiating the 1997 Act. Uganda remains one of the few African countries to have implemented an active universal services policy, the Rural Communications Policy by 2001. This policy recognised the weakness of rural area telecommunications coverage and set out the objective to “increase the penetration and level of telecommunication services in the country through private sector investment rather than government intervention” (UCC, 2001: 3). One of the basic services initiatives included that, one public pay phone be available within every 5,000 persons or at least every sub-county operates two payphones (UCC, 2001: 19). The monitoring of indicators has also been included in the policy to measure the progress of the policy. Under the Rural Communication Policy and the original Uganda Communication Act, a Rural Communications Development Fund (RCDF)

was developed in 2003 whereby all three mobile operators were subject to a one percent obligatory levy to the RCDF. The UCC, in consultation with the operators, has identified the rural areas where the operators do not plan to service, and the RCDF hopes to provide subsidies towards tendered contracts to roll out connectivity in these areas to meet the telecommunication needs for those underserved communities. This fund is meant to install new pay phones in all of the country's identified 156 (out of 920) sub-counties, to assist small rural internet cafes in starting up and training, to create local content for the internet and to give subsidies to rural tele-kiosks. In 2002, businesses providing public pay communication in their internet cafés, telecentres or payphones were no longer required to pay license fees (Masambu, 2007b). This Rural Communication Policy initiative is supported by a \$5 million (USD) financial seed funding assistance from the World Bank under the Energy for Rural Transformation Project (Tusubira *et al.*, 2003: 44). The National Information and Communication Technology Policy of 2003 developed as a result of one of the main objectives from the Rural Communication Policy. This policy delivers the framework and action points for universal access to telecommunication. Uganda has been most progressive in their universal access policy framework. Uganda is forging to deliver services to all members of their population through their progressive telecommunication policy framework.

3.3 Current Telecommunications Issues in Uganda

While improvements in communications are today evident in Uganda, the continuation of competition and ensured reach to the disadvantaged remain major issues in the sector. UCC statistics state that 21,475 public pay phones are operational in Uganda (excluding privately run pay phones) and nearly 3,575,263 mobile phone subscribers are connected (Masambu, 2007a: 13). This 2006/07 fiscal year alone, the government was able to generate \$ 360 million USD in the post and telecommunications sector and spend annual investment in telecoms at \$71 million USD (Masambu, 2007a: 10-11). The rural subsidy program is active with 771 Community Information Centres, with information portals being developed at all districts and another 50 ICT training centre and internet cafes funded in the rural areas. (Masambu, 2007a).

Even with these positive outcomes, the National Information and Communication Technology Policy Framework for Uganda as it exists, does not meet the dynamic environment of Uganda’s telecom industry, which is the reason for a recent sector policy review under the Communications Act Amendment Bill (UCC, 2005c). For example, the policy review report found that a major challenge to the future of telecoms was the “removal of unnecessary barriers to the market” and the need for a public/ private partnership as a method for more effective Uganda telecom development (UCC, 2005c: 9). Currently, Uganda’s tax on mobile phone operators is one of the highest in Africa, at around 30 % (18 % VAT and 12 % withholding tax) in every prepaid minute, and operators pass this cost on to consumers (Oluka, 2007). The Ministry would need to determine whether changes to the current tax rate would hinder or improve outreach to Uganda.

As displayed in Table 3.3, Uganda still has one of the highest call cost rates and lowest per 100 inhabitant rates within East Africa. The other telecom issue is that many within the Uganda population are still illiterate and human capacity on ICT use will need to be raised for improved and productive use of ICTs. The government is looking into improved extension services to education, health and agriculture (Masambu, 2007b).

Table 3.3: Telecommunication Statistics of East Africa and South Africa

Country	Population (millions) 2006	GNI per Capita US\$ (2002)	Local Phone Call US\$ per 3 min	Mobile Phones subscribers per 100 inhabitants	Personal Computers per 100 (2005)	Radio sets per 100 (2002)
Rwanda	9.2	210	0.04	3.40	0.21	15.11
Uganda	29.8	240	0.13	6.73	1.67	15.49
Kenya	35.1	360	0.04	18.47	1.44	21.83
Tanzania	39.0	290	0.07	14.78	0.93	39.79

South Africa	47.6	2600	0.07	83.33	8.36	24.24
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Source: ITU 2007b

Since the expiration of MTN and Uganda Telecom’s duopoly contract in 2005, the government must decide what enabling, competitive policy would be best for the state of the national operators (Tusubira *et al.*, 2003: xi). The cost of calls could be made more affordable by defining new strategies and plans through the implementation of a new telecommunications policy.

The issue of gender had been absent in most of the universal services policies until the 2003 issue of the National Information and Communication Technology Policy. Uganda’s policy framework attempts to address gender through objective 4.2 (j): “to ensure gender mainstreaming in information and communication programmes and in ICT development” (MoWHC, 2003: 33). Under *Objective 10: Gender Mainstreaming*, the following strategies are listed:

- (a) Take into account gender information needs and interests of both men and women in all information and communication programmes.
- (b) Develop mechanisms of increasing women's access to information (especially in rural areas), so as to reduce the gender information gap.
- (c) Use non-discriminative gender sensitive language in information and communication programmes.
- (d) Ensure equal participation in all aspects of ICT development.

While the framework addresses gender, little implementation follow up or direct targeting initiatives have ensured that the gender objective has not been implemented.

Another major consideration for telecommunication policy is electrification. Although many rural communities still lack electricity, the Ministry of Energy and Mineral Development (MEMD) hopes to increase their provision of electricity to rural households by 10 % by 2012, and thereby assist with keeping mobile phones in rural areas with use (IMF, 2005: 66). Even with progressive telecommunication policy, issues of electrification, meeting the reach of the disadvantaged like women, and maintained competition still remain major challenges for Uganda.

3.4 Summary of Uganda's Telecommunication Environment

In Uganda, 84% of the population lives in rural areas. When the rural poor cannot access the same ICT resources as the urban population, inaccessibility further drives the digital divide, isolation from technology and socio-economic deprivation. A recent study by Vodafone found that economic growth from cell phones only emerged once "critical mass" came into effect (Coyle, 2005: 7). This means governments must see the important nature of universal ICT access for society in order to reap the economic changes in their respective countries. Ugandans are only now seeing the changes of pro-growth and pro-poor strategies emerge through policy implementation and after effects. The need to measure these changes would only benefit policy makers in clear, marked evidence as to whether their policy has improved the lives of the poor. More specifically, measures of how Ugandans have changed their spending patterns as a result of mobile phone ownership and usage would indicate whether affordability and outreach are meeting the citizens off all Uganda.

Chapter 4: Methodology

This chapter describes the case study methodology adopted for this research. The case study engages with in-depth, one-on-one semi-structured interviews of the chosen unit of analysis, in this case, households. Key informant interviews and focus groups are also conducted with citizens within the village of Katote, Wakiso District, Uganda. The intention of the case study methodology is to contextualise the circumstances under the purposively selected location and rural households. This section shares the criteria for the data collection process as well as the analysis method of this qualitative study. This study will show how the case study relates to the theoretical framework, the sustainable livelihoods framework, and how today's everyday life experiences and vulnerable circumstances in relation to mobile phones are shaped within this framework. The rationale for the case study is to get a true micro-level sense of behavioural changes in a rural community since mobile phones became available.

4.1 Data Collection

The data were collected from June 4 – 20th, 2007 in Uganda. The data were collected during a critical period in June, at the start of the rainy season, which generally brings flooding in the region. The rainy weather after June would have been difficult to travel, in terms of transport by foot, motorbike, or bus taxi within the village as well as back in to Kampala. Before conducting any fieldwork in the Ugandan village, a permission letter was delivered by the research assistant to the village chairman a week before for fieldwork. The village chairman agreed to the research in his designated jurisdiction and also agreed to be interviewed.

Before the field study, a one-on-one training session for the local research assistant took place for two days. The training session consisted of conducting mock interviews with the question guide and getting familiar with the mobile phone spending terminology. A 35-page training manual was given to the research assistant as a reference point as well as a copy of all interview guides. The researcher was an obvious outsider to the chosen community and the local research assistant was also not from the study area. The local assistant, however, had exceptional interpersonal and language skills and was able to make the families and interviewees comfortable

enough to speak freely during our interviews. The preparations for the case study are crucial in ensuring favourable work conditions and consistent data collection.

4.2 Location Selection

The selection of village location was purposive and strictly followed the researcher's set criteria of vulnerable households from rural communities. Katote village, twenty-five kilometres outside of the capital city, was chosen as a result of the criteria provided by the researcher: rural but accessible by local taxi, motorcycle or bicycle, mobile phone connectivity, safe, limited electricity, limited tap water availability and facility to stay with a household home for the duration of the study. The location was chosen with the help of a field research assistant and the Network of Ugandan Research and Research Users (NURRU) in Kampala. NURRU is a group of researchers familiar with rural fieldwork in Uganda. The transportation was limited mainly to motorcycle taxis in Katote, and the closest access to reliable van taxi transport was in the nearby commercial area, Kawempe (10 minute by motorcycle taxi). Kawempe provided van taxi transport that could then take one to Kampala. Katote village road infrastructure was made up of unpaved dirt, muddy roads. It is important to highlight the difficulty of transport in Katote because it may add perspective to the resulting findings on transport cost substitution by many of the respondents. The area of Katote had met all the rural village criteria and appeared to be a reasonable place to conduct the research.

4.3 Qualitative Data Use

The qualitative research is the appropriate methodology for a case study which aims to get a deeper descriptive understanding of the socio-economic changes in a rural area as a result of mobile phone adoption and a more competitive telephony environment. Within the data itself, some quantitative data analysis consists of the household's total expenditure budget compared against the national poverty line. While the study could have incorporated a quantitative analysis from other ICT usage datasets, the time limitation has kept this study's boundary to this Uganda qualitative

study³. The majority of the data was collected using qualitative methods on mobile phone spending and outcomes within one particular community in Uganda. The perceptions and experiences of the mobile phone in a family and individuals' lives will be the basis of interpreting the effects of the mobile phone and the industry environment, which has made that phone available.

4.4 Household Selection

Rural households were the key groups to be examined in this study. Only six households were chosen and the small sample was intended to be purposive. The researcher interviewed a variety of low income, Ugandan homes: farming homes, young families, widowed families, disadvantaged families and so forth. These families were chosen with the help of a key informant from the community. The research team asked the key informant to pinpoint families within the community who owned at least one mobile phone among the household, who were identified as having low-income generating capacity and were available for interview. The size of family members ranged from four members to fourteen members. The chosen families generally owned or rented houses in the village, with the implication that such household selection excluded the vulnerable groups such as the displaced or homeless individuals in the community. However, interviews showed that these households were in the low income group as identified by below poverty line income per capita, large family numbers, lack of furniture and the vulnerabilities described during the interviews. Most families spoke the local languages, Luganda or Nyonkole, and the research assistant was available at all interviews to translate the conversations from the local languages to English. Before an interview time was set, each household head was given a copy of an introductory consent form in the Luganda language which the research assistant read aloud to ensure understanding. Another copy was signed and returned to the researcher. Interview times were agreed at the initial meeting and mobile phone numbers were recorded in order to remind the interviewees the day before or on the morning of the interview. The selection of low-income

³ Two projects, Research ICT Africa! 2007 e-Usage African Surveys and PICTURE Africa's Poverty and ICT East Africa Surveys are two larger quantitative and qualitative studies which will look at ICT usage in both urban and rural areas.

households involved a purposive yet consistent approach by the researchers so as to capture their expenditure trade-off when making use of a mobile phone.

4.5 Qualitative Research Tools

Several data collection tools were used for this study: a) household and key informant interviews, b) mobile diaries, c) focus group discussions, d) observation summary notes, and e) personal journals. The main approach to this study was to conduct semi-structured group interviews with household members, followed by key informant interviews and focus group discussions. An interview question guide was prepared specifically for the household, key informant and focus group discussion. With regards to the households, sixty to ninety minute interviews were conducted with six families in the Katote village in the Wakiso District, specifically asking questions about the family's demographics, expenditures, mobile phone and mobile phone services behaviour and vulnerable shocks. The six families were also asked to complete a ten-day mobile diary notebook. At the end of the day, each family would fill out a small notebook which recorded received and sent calls, SMS, beeps and the nature of the call for ten continuous days. One family had two mobile phones so two diaries were arranged. In order to ensure the mobile diary was completed correctly, one to two follow-up meetings and SMS reminders were carried out with the households.

Other semi-structured interviews were conducted with key informants within the area, such as mobile public phone operators, airtime re-sellers, repair shops, phone charging booths, etc. A total of ten key informant interviews were conducted. Table 4.1 shows the list of informants interviewed.

Table 4.1: Schedule of Interviews in Uganda

Type of Qualitative Method	# of people	Type of Qualitative Method	# of people
Households Group Interview (6)*		Key informants : (village chairman, airtime re-sellers (2), mobile repair technician, microfinance credit officer, mobile charging business owner, call box operators (2), elderly (2)	10
Household 1**	14		
Household 2	9	Focus Group Discussions (3)	
Household 3	4	1 Women in Salon	9
Household 4	6	2 Builders at worksite	7
Household 5	4	3 Women- Informal Savings Group	9
Household 6	9		
		One-page Observation Summaries	
		Ethnographic Journal	

* the names of the family have been changed for confidentiality

**not all families members were interviewed

The key informant interviews were used to ask respondents about their insight into a household's mobile phone ownership, the substitutions that they perceived that they had made for the mobile phone and its services, utilization of financial services as a result of mobile phone ownership and changes of spending within the family. Most key informant interviews were spontaneous, on-the-spot interviews with members of the community. This spontaneous technique often found success in getting people to share their candid opinions.

The three focus group discussions also used a semi-structured interview format with separate men and women groups. The focus group discussions consisted of one female group in a salon, one informal women's savings group and a group of men builders. These focus groups mainly looked at intra-household dynamics and gender differences on budget allocation within the household as a result of the mobile phone. After each day, a one-page observation form was filled out by the research team, which describes the events and interviews from the field day and to offer preliminary interpretation of the interviews. Photography and some video recording were also used in order to provide visual representation of the lives of the families. Lastly, the researcher carried a personal journal which kept track of her own thoughts

and reflection during the ethnographic field work particularly contemplating her time spent with the home stay. Several qualitative tools were utilized for this study in order to get a detailed understanding of the community and its changes as a result of mobile phone usage. The extensive use of qualitative tools will help to shape an overall, holistic view of the situation facing households in Katote village.

4.6 Data Analysis

Case study analysis was the appropriate methodology utilised for this study. Alternative qualitative analysis method were explored by the researcher but were thought to be inappropriate. For example, content analysis may not work in this study due to the lack of volume of qualitative material. Inductive analysis may also not be the suitable since the themes had been set prior to the study. Duncombe (2006) had successfully applied a Botswana case study on ICT use with micro-enterprises and became a fitting model for this study. The interviews and focus group discussions were all spoken in the local languages, translated during the interview by the research assistant and recorded on a voice recorder. The researcher for analysis then transcribed the work. All the transcriptions, observation notes and daily ethnographic notes were entered onto an open source qualitative analysis software package, TAMS Analyser. The household group interviews were analyzed first through manual coding sentences and paragraphs by hand. With the community as the case study's unit of analysis, the transcripts and ethnographic observation notes were coded according to common responses or ideas given by participants. The process of analysis included taking the coded material and classifying frequently mentioned ideas and images by the households, key informants and focus groups. As case study analysis defined by Patton (2007: 447), these individual case studies were then a layer of units which were analysed across cases and help provide demographic descriptions of the community, their asset portfolios and the community where they live. This process then followed with classifying identifiable patterns recurrently arising from a TAMS Analyser-produced matrix of the six households and focus groups against the pre-set themes of substitution, financial service provision, and intra-household asset negotiation. The researcher attempted also to analyse other cross-cutting themes such as gender dynamics as a result of its frequent mention by respondents in the study. The case study methodology provided an ideal in-depth process which pulls together

several forms of data collection and delivered narrative findings applicable to this specific community at this point in time.

4.7 Study Limitations

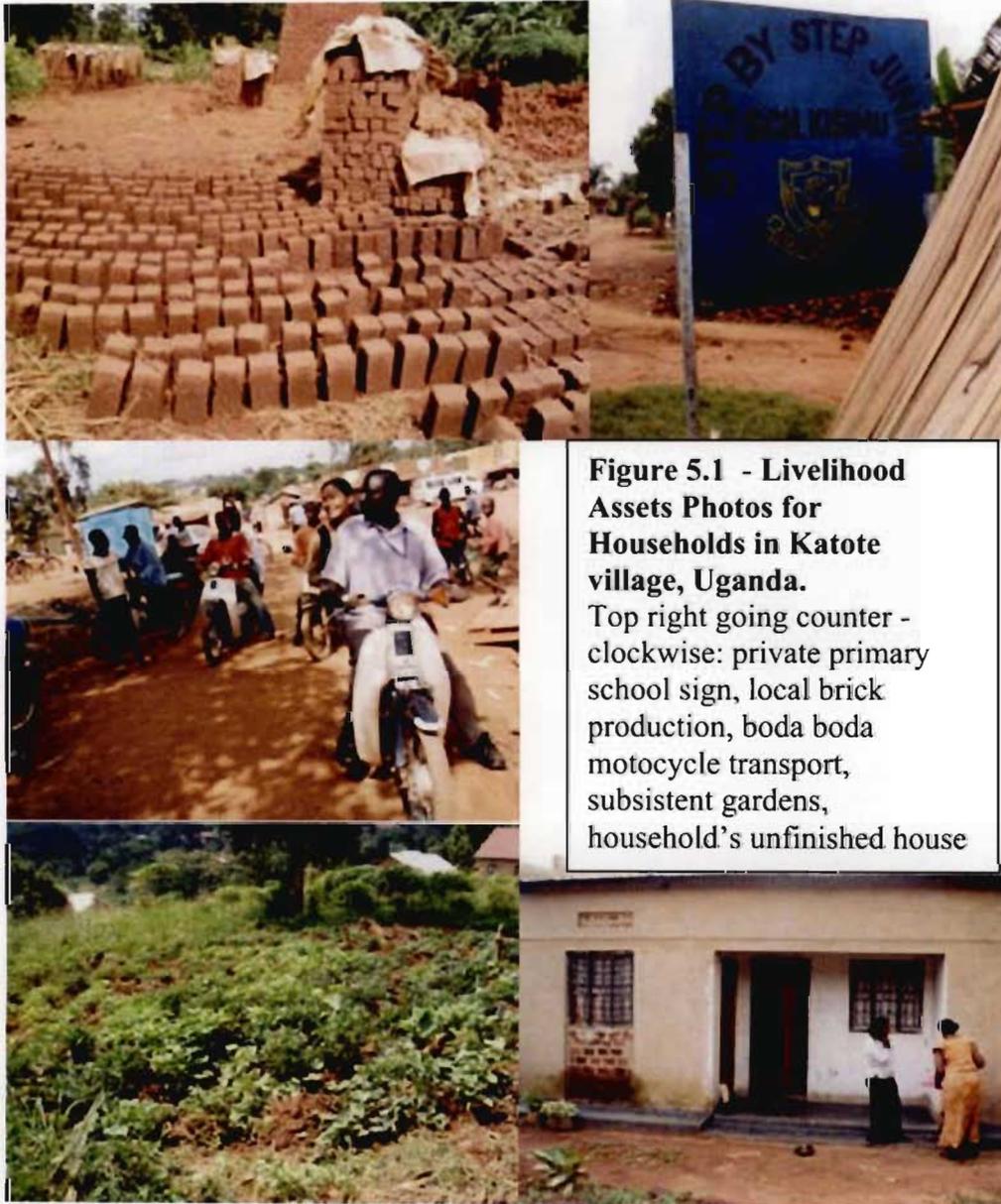
The case study found that literacy was a barrier for some respondents when it came to filling out the participatory mobile phone diaries. The research team spent a great deal of time going back to the homes every few days and spending at least an hour per session with the homes ensuring the diaries were being filled in correctly or assisting to fill in the blanks. Despite this effort, the entries written by the respondents were simple answers, occasionally without sentence structure or coherency. To address this, the families received an SMS every few days to remind them to fill out the mobile phone diary. The other limitation is the time sensitivity of a study on technology impact. Respondents are exposed to ever-changing technology and the response to the integration of technology evolves with growing availability and emerging innovation by the user. The implication of technology evolution may mean that this study solely observes changing spending patterns at one point in time and not in other parts of the region. Interviews times were decided at the initial meeting with families, but the research team found it generally difficult to have all family members together at once, especially when one household consisted of more than five persons. The morning and early afternoons were difficult to conduct interviews as many wanted to complete their household duties at that time or the children were at school.

4.8 Summary of Uganda Case Study Methodology

This case study approach was utilized for this rural Uganda research with use of qualitative tools, the application of the sustainable livelihoods approach and qualitative data analysis with the open source tool, TAMS Analyzer. The study attempted to interview families, focus groups and key informants on how they manipulated their expenditure budgets in order to acquire a mobile phone or mobile phone services. This study attempts to appraise not only expenditures on mobiles and mobile phone services, but examines the opportunity costs that households are prepared to give up in order to acquire a mobile phone as part of their livelihood

strategy, including the substitutions that they make by foregoing other services or goods. Once research determines how much East African households are willing to sacrifice for the use of mobile phones and services, policy makers and development agencies alike can start to understand the linkages of their current policies to people behaviour. The pilot study can expand to further scaled up studies to find the extent of value and importance which households place on ICT use as applied to the rest of the country.

Chapter 5: Findings from Katote, Uganda



This chapter presents the fieldwork findings, which took place in the Katote village, Wakiso District, Uganda, June 3-20, 2007. The chapter opens with an overall country background about household assets in Uganda followed by the actual household descriptions, their assets and mobile phone access and affordability within this village. This chapter will then present a descriptive overview of respondents' perceptions of their changes in behaviour, including an analysis of their current budget manipulations as well as their asset substitutions for access to mobile phone services. The chapter also touches on financial services use and intra-household asset negotiation. The analysis of these findings and further discussion is found in Chapter 6.

5.1 Well-Being and Assets

The recognition of a household's existing asset portfolio provides the context of a rural home's circumstances and complements the data findings from the spending behaviour. Assets may be utilized, combined or sold to access mobile phone services or to purchase a mobile phone. Therefore, the asset stock can give a better overall perspective of the severity of substitutions in an environment of limited resources. It also shows how some households have wisely used their mobile phone spending in enhancing their livelihoods, while others find their mobiles hindering their well-being and further driving them into poverty.

5.1.1 Household Well-Being and Assets in Uganda

An overview of household assets in Uganda for this case study has been collated through the Ugandan national statistics' household surveys and other living standards measurement surveys conducted by institutions like the World Bank or United National Development Programme. Some of the measurable household assets derived from the available data include household consumption capacity, physical assets and education levels. Firstly, Appleton's household survey analysis from 1992 to 1998 finds a slow increase of private consumption per capita (Appleton, 2001: 88). The most recent 2005/06 Uganda National Household Survey also reveals that private

consumption per adult equivalent rising in both rural and urban location⁴ (UBOS, 2006: 58). The rise of consumption can imply an increase of income, which is one aspect of poverty reduction. Employment is another poverty indicator; agricultural employment in Uganda has improved since the recovery from civil war. The most common form employment in the country is in smallholder agriculture (69 % of total employment) (UNDP, 2007). As a result of improved consumption and employment progress, the national survey states that 31 % of Uganda's population falls below the national poverty line (UNDP, 2007) and has been dropping since 1992 (56 % below poverty line in 1992). The absolute poverty line⁵ in 1999, according to Appleton was around 16,443 UGX. In 1999 this was around \$34 per capita per month or close enough to the \$1 a day poverty line set by the World Bank. (Appleton, *et al.*, 1999: 14; Appleton, 2001: 92). Higher consumption levels, stabilized agricultural employment and income poverty level decrease are positive financial asset indicators of household livelihoods in Uganda.

The Ugandan population has also improved their lives through the gradual acquisition of physical assets. Deininger and Okidi's examination of rural Uganda between 1992 and 1999 found low-income citizens who had acquired human and physical capital assets profited during this era of liberalisation (2001: 6). The most noticeable change in a household's livelihood is in the form of housing. According to the 2005/06 Uganda household survey, 75 % of homes are owned by the homeowners while the remaining stay with "rented dwelling units" (UBOS, 2006: xiv). In terms of materials, two-thirds of surveyed households had iron-roofed homes, half of the homes were constructed of brick walls and three-quarters had earth floors (UBOS, 2006: xiv). One-tenth of the households in the national survey had no toilet facility. In terms of sanitation, only 43 % of the population used improved sanitation facilities⁶

⁴ According to the Uganda National Household Survey 2005/06, the Mean Consumption Expenditure per Adult Equivalent per month for rural households grew from 21,200 UGX (\$12.85 USD) in 1992/93 to 33,900 UGX (\$ 20.54 USD) in 2005/06. Urban household grew from 43,200 UGX (\$ 26.18 USD) in 1992/93 to 71,800 UGX (\$43.52 USD) in 2005/06. (UNHS, 2006: 58)

⁵ Appleton *et al.*'s poverty line uses a basket of basic goods (food and non food) to calculate the minimum cost of meeting 3000 calories in Uganda farmer's diet. This number would become the absolute poverty line (1999: 14).

⁶ According to the 2007 United Nations (UN) Statistics' Millennium Development Goals (MDG), the definition of an improved sanitation facility includes "flush to piped sewer system, flush to septic tank, flush/pour to pit, flush/pour flush to elsewhere"

in 2004 (UNDP, 2007). The use of an improved water source⁷ reached 60 % of its population (UNDP, 2007). Only nine percent of Ugandan homes had electricity (UNDP, 2007). In terms of durable goods, 39 % of the surveyed owned a bicycle. While Ugandan citizens are still lacking some of the basic amenities, home ownership appears to be main physical asset held by a majority of households.

The Ugandan government has been heavily investing in education as a means to reduce their high illiteracy rate and raise their human capital stock. Currently, 67 % of Uganda's population is literate. Since 1996, the government enacted their free education initiative called the Universal Primary Education (UPE) program, and invested close to 18.3 % of its public expenditure on education (UNDP, 2007). As of 2005/06, over 7.6 million Ugandan children are registered and attending school; this number is more than double the enrolment rates in 1997 (UBOS, 2006: 18). However, it appears that factors are still deterring students from completing primary school as 43% of children registered in Primary Grade 1 never complete final Primary Grade 7 level. In the household survey, a government school pupil would be expected to pay around 19,000 Uganda Shillings (\$11.50 USD) annually while a private school would be around 64,000 Uganda Shillings (\$38.80 USD) (UBOS, 2006: 21). If the dollar a day poverty line scenario (or \$365 USD annually) applied in this case, those earning poverty line income can spend over 3 % - 10 % of income on primary school (no boarding) education for one child. High costs to education even under UPE are still a major deterrent for school completion particularly if there are several children in the family to fund. The Ugandan government still has a task of improving reading programs for one-third of illiterate in the country while at the same time developing strategies to ensure student completion of primary school education.

The Uganda overview of household assets shows the gradual improvement of households in terms of consumption levels, housing availability and education since the early 1990s. While the improvements are noted, one-third of Uganda's population remain under the poverty line, high school fees keep primary school dropouts near 50 % and improved electricity, sanitation and water facilities remain low. The following case study will dig deeper and will try to understand how the introduction of mobile phones have today affected the livelihoods of the households in Katote village.

⁷ According to the MDGs (2007), the definition of an improved drinking water source includes "household water connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection and bottled water – if a secondary source is also improved".

5.1.2 Household Well-Being and Assets in Katote

In the village of Katote, much of the previous Ugandan asset description matched the homes in this rural village. In Table 5.1, the description of each household reveals the number of family members, income levels and mobile phone ownership history.

Table 5.1 Findings: Household Characteristics

	HH 1	HH 2	HH 3	HH 4	HH 5	HH 6
Ages of Adults (female = f, male = m)	50 (f;widowed), 20 (f)	35 (m;widow), 26 (f)	35 (m), 26 (f), 29 (f)	26 (m), 20 (f)	45 (m), 40 (f), 24 (f)	60 (m), 50 (f), 20 (m), 23 (m), 24 (f), 30 (m), 27 (f)
# of children (18 and under)	6	2	3	2	6	7
Average age of Children	5	3.5	3	4	5	9.5
HH Income Level (p.month - UGX)	40,000	100,000-200,000	50,000-100,000	10,000-30,000	100,000-200,000	20,000
Main Source of Income	rent from homes	formal, printer asst.	sells herbal remedy	cyclist messenger	farmer	farmer
Secondary income source	Remittances	p/t pastor	brickmaking	Wife – sells kiosk food	Construction, remittance, wife - farm	Poultry, livestock, brickmaking, wife- mat weaving, bricks
First phone when?	2006	2005	2005	2007-05	Unknown	+2000
Where?	Used phone, daughter's gift	used, friend	customer, gift	Used phone, friend	used	used, neighbor
Cost of phone?	0	75,000	0	20,000	??	100,000
Current phone	1 1/2 months	same phone	same phone	same phone	3 months	1 year
# of phones (incl. now)	2	1	1	1	2	2
Cost of Current Phone	85,000	n/a	n/a	n/a	Gift 0	148,000
Average Cost (p. month) Phone Services	15,000 (but son buys airtime)	20,000	21,000	20,000	20,000	22,000
Homes	Owned house w/ rental units	own house, in construction	Rental 1-bdrm unit	Rental 1-bdrm unit	Own house w/ detached units	Own house w/ detached units
Assets	Radio, house	Radio, bicycle, house	Radio	Radio, bicycle	Radio, bicycle, house, farm, livestock	Radio, bicycle, TV, house, bricks, livestock

Out of the six households studied, four owned their house on a plot of land. All of the houses were unfinished concrete buildings with iron roofs, with the rest of the plot either used for livestock rearing or for subsistent agriculture. Another common feature of these homes were the numerous non-attached self-catering extensions on the plot of land. These extensions were homes for the sons or parents of the family. The research team was told that upon reaching the age of adulthood (performed circumcision during teenage years), a son must build his own home and cook for himself. As many families cannot afford purchasing a separate plot of land for the son, many have allowed the boys to build an extension detached from the main house. Most of these homes had outdoor pit latrines and cooking occurred from small ceramic or tin coal-based cookers outside the home, sometimes in a makeshift wooden shed. One house was in the midst of construction with piles of bricks and concrete sitting outside the house. The household head was waiting for the time and money to continue building the rest of the extension. In this village, there was much construction taking place. Many households were engaged in making bricks, building a house or constructing ground-level one-bedroom rental dwellings blocks. The other two families that were surveyed lived in these one-room rental blocks called “muzigos” built alongside each other. The families were paying 15,000 UGX (\$ 9.09 USD) per room (one family rented one room, another family rented three rooms), while families who own their homes report paying no rent. These rental blocks had no garden and it was unlikely to have toilet facilities for the families in these blocks. These rental dwelling households had moved to Katote from other villages, using the proximity to the capital of Kampala, as a strong reason to relocate to the area. None of the buildings had electricity and all depended upon paraffin for light. Only one house had water piped into the building, while the others either purchased water or drew water from a well or the nearby river.

In terms of durable consumables, the farmer households had dilapidated wooden seats in the main sitting room while the widowed families had nice well-kept sofa seats and table. It did not appear to be much furniture except for a mattress with the rental dwelling families. All households had a mobile phone and at least one small battery-operated radio. One family had a TV, but whether it actually worked was not ascertained. Half of the surveyed households also had a bicycle for work and transport. None of the respondents owned a car; in fact, there were only three cars in

the village. Boda-boda motorcycles were the most common form of motorised transport.

In term of education, the UPE program unfortunately did not reach the community of Katote. There were several primary schools and pre-primary schools in Katote, but none of them were UPE-government funded. Most parents in this area therefore paid for private schools fees for their children's pre-primary, primary and secondary education. Within the respondent families, none of the household heads completed high school and three had stopped at Senior One level (first year of high-school). As for the children currently in school, three households reported annual school fees around 420,000 – 630,000 UGX (\$ 250 - \$ 380 USD) per year. One of the families sent their two children to boarding school, where tuition and other school expenses averaged 449,000 UGX (\$ 272.10 USD) per student per year (UBOS, 2006: 21). One farming family admitted to not having the funds to send their 13-year-old child (out of seven children) back to school. The relatively high cost of education has put some families in a difficult financial position as they attempt to accumulate enough money for school fees while maintaining the family livelihood.

In terms of skills assets, it appeared that the homes were still largely involved with agricultural labour or simple brick making skill. Technology-wise, the nearby convenient distance of phone booths and the growing availability of mobile phones have meant almost all Katote adult members used the mobile phone at least once if not became occasional users. With that said, the adult family members were increasing their knowledge of mobile phone use and costs. However, one key informant did say that his wife did not know how to use the mobile phone, so therefore he made calls on her behalf. Another household head said that he called on his sister's behalf because he did not want her to use all his airtime. This display of limiting technology skill set illustrated Barrantes' digitally poor when human capital is not enhanced with new technology learning or ability.

Of the Katote residents surveyed, most of the respondents had their primary job and subsequent additional work. For example, one farmer also had construction and two other families had brick making as their other occupation. The widowed man was also a pastor besides working at the printer shop in Kampala. The households were able to diversify the work that they undertook. The range of income earned by the household head was from 10,000-200,000 UGX (\$ 6 - \$121 USD) per month which averages at 75,800 UGX (\$46 USD) a month. One farmer household did

mention lower than usual earnings last month because the household head had been ill and could not work. The partners of some of the household heads were generally earning meager wages, if anything, from farming or selling little goods in makeshift kiosks. One wife was selling home-made cassava chips in front of their house. Most income reliance of the families remained with the household head's earnings.

Income security ranged between families. The farmer's income was dependent on good crops, therefore income reliability was only predictable per harvest. The two rental home families both had earnings from casual labour or from sales' commission, thus income was also unstable month-to-month earning. The surveyed widowed families' incomes were the most stable with the widowed father working at a print shop in Kampala town and the widowed grandmother earning income from rent collected from the one-bedroom rental dwellings. Low-income households struggled with unpredictable funds which was likely to make the terms difficult to meet for financial planning purposes.

Remittances were another source of financial capital. Two families had relatives living abroad and received remittances from their relatives. One farmer had a sister in Greece and received annual remittances from her. The widowed grandmother had a son who had recently returned from Russia and who used to send remittances. While the remittances had ended for her, she had been able to fund the construction of the rental homes next to her house. Two of the older key informants also gained remittances through airtime transfers. In terms of money management, many households were involved with another form of financial capital, an informal rotating savings group or known in the community as "ngina". Some women also carried small wooden savings boxes in which their daily savings were kept. Some families also mentioned holding bank accounts or microfinance loans for livestock projects.

In many parts of Uganda, villages were surrounded by fertile soils making agriculture extremely productive in the region with a diversity of grown produce. The weather supported productive crop growth through an abundance of rain, humidity and sunshine. The Katote area was most unusual (in comparison to, say, Kampala) because of the rich soil which is found in this area. Land could be purchased and owned in the village following discussion with the chairman. However, not everybody could afford land and therefore ended up in one-bedroom dwellings without garden plots. Residents were able to make bricks for their homes from the

rich clay mud. As water was not tapped to their homes, many families sent their children to collect water in the nearby well or river. The rich land and ideal weather conditions have benefited farming communities with rich production of vegetables and fruit.

The households reflected strong social capital within the family as five of the six households had relatives outside of their immediate family living at their plot. These relatives were mainly assisting with house help and child-minding duties. The Katote homes appear to rely on the village chairman to resolve and coordinate community issues. For example, all homes asked the research team whether the team had consulted the village chairman before conducting the fieldwork. Those community members with mobile phones were able to stay connected with family members now living abroad or those working away from their rural home. Social capital was also evident from the numerous informal savings groups in the village. Many people were forthcoming in stating their religious denomination and therefore implied participation at church or mosque. Formalities and tradition was highly visible as when the children bowed on their knees to greet the adults. Social capital appeared strong with the men as many of them spent their day at the trading centre chatting, gambling and playing games as they waited for the next casual work opportunity. While not really recognized in this category, security and safety can help build social capital. The community of Katote was relatively safe with little crime (only a few cases of petty theft) but otherwise, one saw the children run freely around this community. The small community knew all of their neighbors well particularly those with owned homes. Social capital appeared to exist in interest and informal groups and local government in the community of Katote.

In summary, the description of assets provides context for this village study and gives an insight to the individual assets of homes in this rural village. The Ugandan government has not made satisfactory progress in providing all families with electricity, running water, or improved sanitation. Uganda still fits the demographic of an agricultural country with a small percentage of the adult population who have completed primary school education and one third of the population living below the absolute poverty line. In the context of this poverty, the next section will depict a picture of the same households which have not met some basic needs yet have made certain decisions or strategies to own or use a mobile phone.

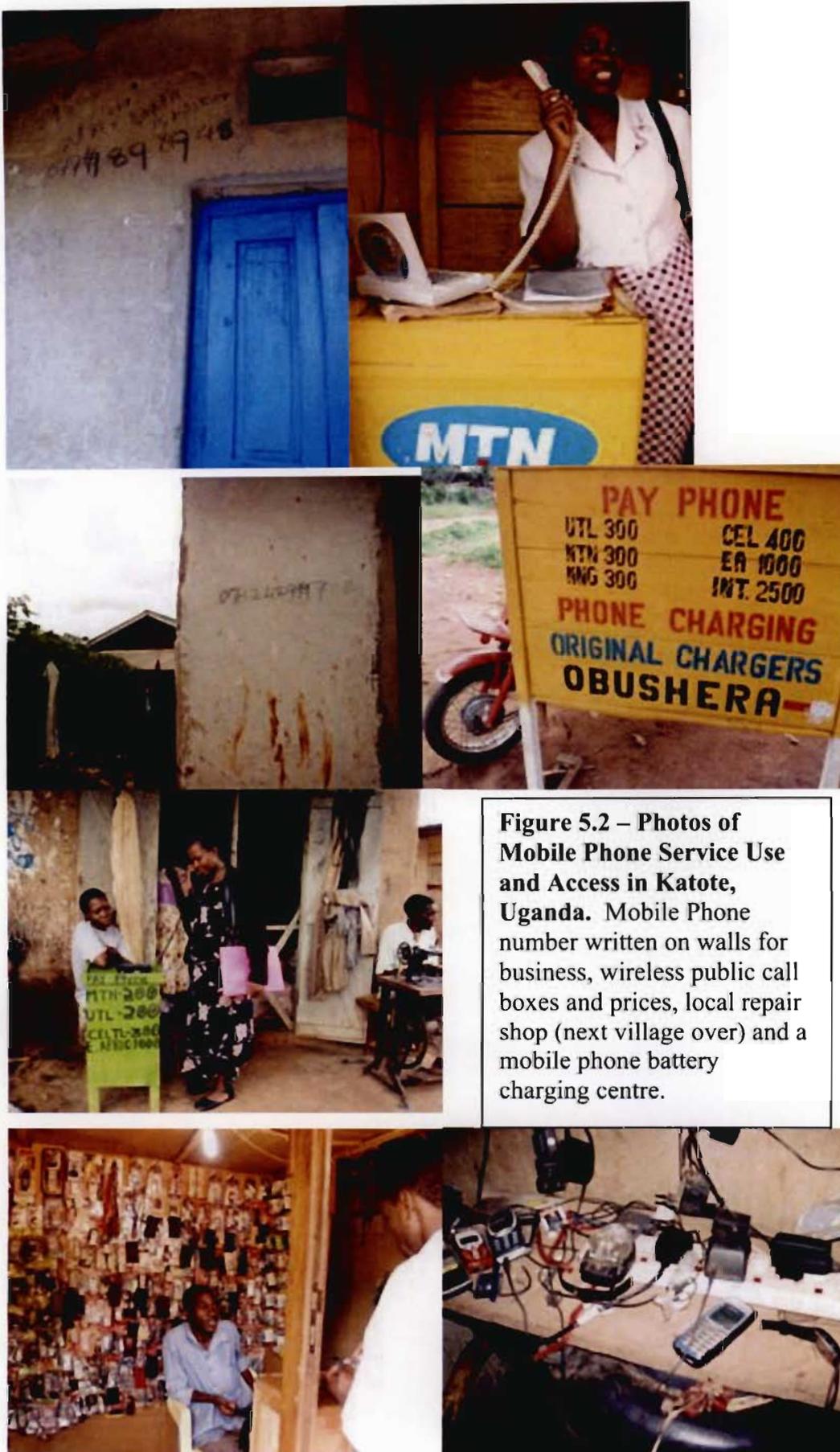


Figure 5.2 – Photos of Mobile Phone Service Use and Access in Katote, Uganda. Mobile Phone number written on walls for business, wireless public call boxes and prices, local repair shop (next village over) and a mobile phone battery charging centre.

5.2 Mobile Phone Access in Katote

The village of Katote has gained mobile phone connectivity in the last decade and this next section examines how the mobile phone and access have been accepted into the community. Mobiles phones and mobile phone services appeared to be readily available in the community of Katote. Mobile phones were possessed by nearly all business owners and by a majority of key informants in the village. In terms of connectivity quality, some respondents mentioned, “network problems” with their mobile phone. During the field study, connectivity was fairly stable, except the research team did experience a few difficulties sending SMS across networks to their households. As for vulnerable groups, the team did find several elderly homes carrying phones purchased for them by their older children who no longer lived in the rural village. Very few children carried mobile phones, but the research team did spot one high school girl using her mobile while she was walking home. Women were also seen with mobile phones, some stating that they purchased on their own phones, whilst others had their phones purchased for them by their husbands. Of the six households interviewed, the widowed grandmother was the only woman with her own mobile phone. However, in the focus group discussion with a women’s informal savings group, almost all the participants had mobiles either purchased by themselves or by their husbands. Katote village did not have a mobile phone retail shop, yet used mobile phone handsets did appear to be readily available. Many families bought used phones from other homes that needed to liquidate their assets, for example, because of an emergency. Some interviewees wished to sell their mobiles because of a fault with the phone that they discover after long-term use (for example, the phone being too heavy, bad network connection, faulty or weak battery, low volume). Many second hand mobile phones were also gifts from relatives or friends. The respondents who acquired new mobile phones purchased the handset in Kampala. Mobile phone access appeared to be easily obtainable in this Ugandan village of Katote.

Mobile phone services were just as accessible. Services included: airtime credit/ sim card selling, callbox/public pay phone, mobile phone repair (in nearby village), mobile handset battery charging centre⁸, and the sale of mobile phone accessories. Access to these services was readily available within the Katote village

⁸ A mobile handset battery charging centre is a shop where customers can bring their mobile phones for battery charging. Charging centres exist throughout Uganda because of the low access to electricity.

as public call boxes or airtime re-sellers were frequently encountered along the main road of the trading centre. A few public call-boxes were found off the main road as well. While key informants stated that all kinds of people used their mobile phone services, many also stated that men were the majority users. While there were no repair shops (with the closest repair shop in the next village), and two known phone charging areas available within the trading centre, they were still accessible for use by men, women, elderly or children. In a village where few households have electricity, some respondents also mentioned charging their mobile phones at their neighbour's home or at their place of work sometimes with or without a fee. There was a proliferation of mobile phone services within Katote, which was more than adequate to serve the village's communication needs.

5.3 Affordability of Mobile Phones and Phone Services

The near proximity of access to mobile phones and mobile phone services meant that villagers did not need to walk long distances to access a phone outlet, as occurs in some of the other rural villages. Even with convenient access, the affordability of calls or handsets in Katote depended upon whether the income generated by the homes was sufficient to match with the prices of mobile phones and their respective services. Many of the older family members had access to some income and therefore could choose to allocate a portion of their spending to the purchase of a mobile phone handset or services. Even women who were doing unpaid house help received a small allowance per day from the working partner for the daily food purchases, children's needs and if needed, airtime. Two key informants, however, clearly stated that women were less likely to call at their public phone booths. They thought women were less likely to have paid jobs that in turn would enable them to pay for the call. Women in the focus group stated that they would purchase airtime themselves if they could access money from their small businesses. Many of the same women stated that their husbands provided them with airtime. As for the elderly, their older children who lived outside the village would top-up their parent's phones by electronically transferring airtime from their phone to their parent's phone. The findings show that family members including the most vulnerable were able to use existing income sources or new sources (for example, airtime transfer) in order to afford a mobile phone or its services.

The reason that people most frequently stated for purchasing a mobile phone was for immediate personal or business need. When asked what was the defining event or moment that drove the individual to purchase the phone, one responded that it enabled the children to keep in touch with their father at all times. One man stated that without a mobile phone he was missing opportunities for work, as employers would first contact those with mobile phones. The mobile phone had thus become a necessity for this man involved in casual labour work. Mobile phones are part of the cycle of gaining income opportunities, which in turn made mobile phones affordable, particularly in this village of Katote.

5.4 Spending Behaviour: Substitutions

While some new income generating opportunities have help to make mobile phones and services affordable, many household scenarios in Katote referred to substitution as a way to meet communication costs within their limited budget. These spending patterns varied between the one-time purchase of the mobile phone, and the smaller incremental expenses like airtime, mobile phone repair and battery charging. This section, therefore, divides substitution into two sections: substitutions for the purchase of, a) the mobile phone handset, and b) mobile phone services.

5.5 Mobile Phone Service Substitutions

All respondents were asked whether they recalled substituting a household item within their regular budget within the previous month in order to purchase airtime or services for their mobile phone. Substitution reported by these rural families included taking funds from the transport budget and from store-bought foodstuffs. Among family members, women were more likely to sacrifice critical family expenses like food while men sacrificed more personal, discretionary spending items such as entertainment costs.

5.5.1 Transport cost substitution

From the study, the most commonly stated substitution made by households by both men and women was transportation expenses. In meeting certain work or

personal obligations, many households stated that the preferred choice was spending money on a phone call rather than incurring transportation cost (either the cost of physically going by foot, taxi, or bus themselves or sending a hired messenger) to conduct the same job. The major reduction of transport cost was from mitigating vulnerable situations. For example, one woman fell off the motorcycle transport and the husband was called to pick her up instead of paying for the expensive taxi to drive her to the hospital. Another household relied on neighbors to call if bricks were being stolen from the plot instead of having to travel later to find their bricks gone. Business costs were also reduced. As travel was extremely time-consuming in the rural village because of the poor road conditions and limited transport options, businesses used their mobile for more efficient means of conducting business like outsourcing delivery services. For example, one restaurant owner called the butchery to deliver meat to his restaurant. Before he owned a mobile phone, the respondent would have to walk to the butchery to make the same request. The respondent saved time (from the trip), taxi transport cost and lost revenue if the shop had to close to make the order. If the shop remained open, the phone call would save extra wages costs if he had to hire an employee to watch the shop. He also stated that the small restaurant was also able to start the lunchtime business earlier than before because he can contact the butcher in a timely fashion. The extra time that he could spend in his restaurant increased potential revenue of the business. One key respondent also relied on phoning a pick-up service for his cow's milk to be delivered to the local shops, which now kept him free to deal with other obligations on the farm. Lastly, other respondents stated that they used alternative means of cheaper transport in order to complete errands, thus saving funds for mobile phone service costs. For example, one respondent replied: "I also decided to use a bicycle, yet I work from far in town for purposes of saving this transport cost and buy[ing] topup for my telephone" (HH 2, widowed man, 2007). This respondent cycled for 2 ½ hours per return trip from his Katote home to his work at a printer shop in Kampala. He was still able to continue his necessary travel to work, while at the same time, used the savings set aside for airtime. All six families and other key respondents mentioned the mobile phone use lowered and replaced transport costs during vulnerable situations, through efficient use of other delivery resources, and by use of cheaper means of transport.

5.5.2 Purchased Food Substitution

The second most common substitution response for mobile phone airtime was the replacement of store bought groceries. Most of the homes would reduce the portion that they would regularly purchase for the home and use the small savings for airtime purchase. Some of the daily household item reductions included: sugar, flour, cooking fat and milk. One elderly respondent stated that she would give up sugar since a one-kilogram bag of sugar was equivalent in value to a top-up airtime card (Key Informant, Elder Lady, 2007). A few households mentioned reducing the number of days the family would eat meat. One key informant also stated that the meat would be replaced with a cheaper substitute like groundnuts and that the savings were put towards mobile airtime (Key Informant, Kiosk Woman 1, 2007). Besides food, another example of money saving methods for airtime was the use of cheaper detergent substitutes. One respondent said, “The third thing, okay, I may decide not to use dishwashing detergent, Omo, and I decided to buy this local soap, for purposes of saving top-up airtime.” (HH2, widowed Man, 2007). The same man stated that he bought a smaller radio which took only two dry cell batteries instead of buying a large radio which needed more batteries. The reduction of battery costs was thereby money saved for airtime. Out of the six households, four had stated making substitutions of regular budgeted store bought food-stuffs in order to spend on mobile phone services.

5.5.3 Home Production of Food

There was also a difference within the grocery substitution itself among different types of households. Those homes with garden plots would state that they would eat more food from their gardens, a more or less free substitute, instead of buying store bought food. The resulting savings would then be used for mobile phone airtime. “Okay, sometimes, I be wanting to eat rice and I say no, then we just eat cassava from my garden and then I buy airtime” (HH1, widowed woman, 2007). Those who could fall back on subsistence food meant that home-owners have assets like land or gardens that had accumulated over several generations and could thereby branch out the options for meeting nutritional needs. Since the family could liquidate other fixed assets or find cheaper alternative substitutes, the household did not have to give up food in order to match the cost of a mobile phone. It was clear that the

households with land or gardens had greater alternatives in meeting store-bought food shortages.

Homes without gardens responded differently by actual removal of food from the diet for the day or week to save for the mobile phone. One man respondent stated, "...and the second thing, I can even spend two weeks without buying milk at home" (HH2, widowed man, 2007). Another stated, "Sometimes I'm hungry, I sacrifice eating" (HH6, son of head, 2007). The most extreme example was Household 3, "He would rather not buy us food but he would rather put airtime on the phone because it is the phone that makes money" (HH3, wife of head, 2007). The most at risk from well-being deterioration as a result of mobile phone purchase were the landless asset-deficient families. The money spent on mobile phone services directly weakened food security (lower food purchase) and children's needs of the families in rental dwellings. The reduced portions of food imply a decrease of calories consumed by the family. These young households had a limited asset pool to use in order to meet the cost of a mobile phone. One was more likely to see the worst-case scenario - households would fail to meet nutritional requirements or fail to improve other essential amenities like water, toilet facilities or electricity. The low diversification of activity for the landless household led to drastic survivalist outcomes on the family's well-being.

However, one household and one elderly key respondent said that they would not sacrifice food for their children in order to have airtime. "For example, I can't fail to buy sugar for children simply to put airtime on my phone" (HH 5, farmer, 2007). They chose to go without airtime to ensure their households had food. While some homes replaced store-bought food with cheaper garden food supplements or decided to go without airtime to make sure their household was fed, other homes admit to some days of hunger in order to maintain the mobile phone.

5.5.4 Gender Differences

Responses on mobile phone service substitutions between men and women were also different. While women were most likely to detail the everyday household expenses they would give up for airtime, men would more likely describe personal sacrifices. One woman did say she would give up having her hair done at the salon, but the rest of the respondents concentrated on sacrifices for the home. Besides that,

women saved part of the household's food allowance money to buy airtime. As for men, some of the builders in the focus group announced how they sacrificed entertainment costs such as the quantity of beer or number of nights for "going out" to save for mobile phone airtime. Other men attempted to cut back on their day-to-day expenses like lunch or stopping a day's work of employees (hence saving on wages) to save for the mobile costs (HH 3, herbalist, 2007). Overall, men tended to make personal expenditure sacrifices for mobile phone airtime while women derived the cost for airtime from the family's daily household allowance.

Men and women also had different responses when asked about sacrificing events or ceremonies for the mobile phone. Some men would state saving money by not attending a funeral or village function. They rather use the money for airtime to phone the family to express their regrets and then keep the money saved for other purposes. One respondent replied to attendance of a funeral, "I had only 5000 [UGX] and decided to put money on my mobile phone and just called them, I didn't go" (HH6, son of head, 2007). The wife in the same family stated that while she would give up going to a party, she would not give up going to funerals for airtime (HH6, wife, 2007). One respondent stated that her funeral attendance depended on the money she had on hand. Women were more hesitant in sacrificing attendance certain cultural ceremonies such as funerals with a mere phone call while men were more frank in calling the family about his non-attendance.

5.6 The Fixed Cost: Mobile Phones

The act of substitution for a fixed item like a mobile phone had more influenced the act of drawing together the savings or funds to afford the handset than direct substitution of goods or services. Only one of the families stated sacrificing existing assets to liquidate and pay for a mobile phone. One of the farmers stated that he had sold off one of his small plots in part to buy the new mobile phone and a poultry housing project (HH6, farmer, 2007). Two of the homes stated putting away savings from their income into their informal savings groups and then used their accumulated savings to purchase the mobile. The widowed man had asked for his advance Christmas bonus from his employer to pay for the mobile phone. The other two families stated receiving their handset as gifts, therefore substitutions did not occur in their case. The sacrifices made by the families were stated as potential

household items that they could have purchased with their savings instead of a mobile. When the young household was asked what they would have bought if they didn't buy this phone, they said that they would have bought clothes, a TV or radio, or a sideboard cabinet instead of a mobile phone (HH3, cyclist, 2007). One key informant's wife stated that she would have bought a sewing machine. One focus group respondent said that she would sacrifice buying children's clothes for a mobile. Another male key informant stated that families would use school fees in order to keep his "business connection" or mobile phone operational with airtime (Key informant 1, Katote farmer, 2007). The families who did save for their mobile phone clearly noted large household expenses, which they would have purchased if that money came available.

The experience of owning past phones had helped some homes in their spending decision for a higher quality, mid-range priced (around 100,000 UGX or \$60 USD) phone, which met their specific needs. For example, one user wanted a phone with a long battery life because of the poor battery life of their first phone. First time buyers like the ones in this study did not have the same experience and found themselves with a used mobile with costly problems like a weak battery or internal malfunction. A problem phone saw these individuals returning to repair shops and phone charging centres more often than those with higher quality phones. The choice of mobile phone can also vary depending on how informed the family member is on the quality of purchased phone.

Sometimes families opted for the most financially productive choices like buying a public call box⁹ business instead of a mobile phone or selling off the mobile phone. One key informant owned a public call box and mentioned that he purchased it instead of getting his wife a sewing machine. He saw a more profitable venture for his wife with the call box than in the tailoring business. One other woman key informant stated that the family bought her a public call box because they hoped that she use the profits of this small business to go towards a new mobile phone. Secondly, existing mobile phones were also being used as a liquidable asset and thus being sacrificed for other needs. The wife of a key respondent had her mobile phone traded in for the husband's business. The findings show some individuals trading the mobile

⁹ A public call box is a small public phone (usually wireless) business used to make or receive calls. They are either located in a shop or on a standalone wooden platform. The call box usually has a vendor who assists with making phone calls and collects payments.

phone handsets or buying other productive assets which can improve their livelihoods portfolio.

In conclusion, sacrifices also occurred for mobile phone purchases however, the forgone costs existed more in the form of alternative things that could have been bought with the income instead of a mobile phone. Substitutions for mobile phones were not as common as the incremental household sacrifices made for mobile phone services. The goods or services that were stated being sacrificed include children's clothes or school fees. Inexperience also ended up being a costly experiment for many first time buyers particularly those who buy cheaper used phones. The strategies attended by households are diverse and evidently led to concrete changes from their lives before the mobile phone.

5.7 Financial Services

In order to understand the spending patterns of those with mobile phones, the various financial services like savings utilized as a livelihood strategy must be examined. Household can make use of their social networks, informal groups and neighbourhood financial institutions to maximise their financial options for purchasing mobile phone services or handset. One key respondent stated that there is a perception that it is mainly the lower income families who would save in increments in order to purchase goods. Another household stated using one big installment from work pay (or in this case, Christmas bonus) to pay for his mobile phone. One farmer had used his social network and received remittances from Greece including a new mobile phone handset. One man had stated borrowing from three different sources: informal savings group, friends, and customers, in order to maintain his mobile phone services (HH 4, herbalist, 2007). A few of the elderly key informants stated airtime transfer being done by their out-of-town children otherwise not done at all with the households. Different financial services strategies have assisted households to maintain and own a mobile phone.

5.7.1 Making use of savings

As stated previously, two households had utilised their informal savings group to pay for their mobile phone. This 'ngina' informal savings group was women or

men who mobilised together and would contribute a certain amount of money to the group. At the end of the month, a person received the accumulated savings. The person who received savings rotated each month until each person had received the savings. Women have used it firstly to provide for their families in terms of household items, utensils, but once these essential needs were met, they then saved for the next important household asset. In terms of spending, women and men did use mechanisms or tried to plan to ensure that money was put aside for household item purchases. This was not a big strategy change in spending behaviour; it continued current savings patterns that men and women were doing before the ownership of mobile phone. One women's focus group, however, were motivated and pushed members to start businesses, to save money, and thereby gave them a reason to own a mobile.

5.7.2 Loans and Credit

One key informant stated that they bought a phone from their neighbour or friend and they were usually able to pay the phone off through small monthly or weekly increments. Credit through friends and families appeared to be a necessary financial and social capital outlet for many households. Microfinance program was not mentioned as a tool commonly utilised to save for a mobile handset. The most common use of microfinance programs was for farmers to help improve their livestock and agricultural base. Only two families had stated having formal accounts either through a bank or microfinance facility. While informal borrowing was a financial tool that existed within the village, very few utilised this source for purchasing their mobile phone handset or pay for mobile phone services.

In conclusion, another spending strategy undertaken by households in order to afford mobile phone services or handset is making use of financial services. However, from these household cases, it appears that nothing out of the ordinary has occurred with their use of informal savings groups or loan programs as a result of mobile phone ownership of services use.

5.8 Intra-household Dynamics

The findings also examined mobile phone ownership through the spending behaviour between individual family members and how such relationships have changed with the mobile phone introduced into household. Mobile phone ownership within a family has been found to be uneven. The mobile phones of the families interviewed were owned by the household head. Phones were kept by the income-earning individual and limited use was allowed to other family members. While one household head would sometimes leave the handset at home for his wife (HH1, cyclist, 2007), the other household heads would keep the phones all day for themselves. Among the key informants interviewed, a handset acquired by the wife of the household was purchased by the husband. In one focus group discussion case, the mobile phone was given to the wife, but she did not feel that she owned the phone. In fact, the same woman said that the husband specifically bought her to phone so that she could be called to open the gate at night. She was also limited to only three phone numbers of relatives who could call her. Her husband stated that he would be able to sell the phone at anytime (Focus Group, Woman #4, 2007). Partner control appears to be exacerbated to some extent with some women owning mobile phones. At the one extreme, the mobile phone has re-emphasized budget control for the income earners. Some household heads claimed the mobile as their own and not to be shared (without their permission) by other family members. The reason that the mobile phone was not shared was to keep family members from wasting costly airtime on an unproductive call. If a phone call needed to be made, the phone owner would make the call on behalf of the family member. The mobile was not always shared as the phone owner stated that he or she did not want to share secrets with family members.

Lastly, younger children were most unlikely to own or utilise the mobile phone. One household was influenced by their children to buy a phone as the father bought a mobile to stay in touch with his children in boarding school (HH2, widowed man, 2007). As the children grow older, however, their adoption of mobile phone technology is quick and these young adults were sometimes looked upon for advice on the mobile phone as was the case for two households. The ownership of mobile phones within families has not necessarily changed household ownership of assets between members in the household.

The elderly also stated having access to mobile phones because of a newly acquired handset from their son or daughter. Most of these sons or daughters live in another village with their spouse and the purchase was made in order for the children to stay in touch with their parents. As for some of the elderly key respondents, many of them stated having full ownership of a phone even when presented as a gift. The findings have seen the elderly become connected mobile phone owners re-enforced by their older children outside of the village.

Mobile phone ownership brought about uneven mobile phone use and purchase in the households of Katote. While children and elderly appeared to improve their phone ownership over time, income-earning partners rather chose to limit use by other household members.

5.8.1 Household Budget

Where the husband is the wage earner and wife is a stay-at-home mother, the husband generally left an allowance or daily amount of money behind for the wife in order for the family to make everyday purchases of food or other necessities. The way in which this household allowance is used has changed as the wife now uses a small portion of this everyday allowance to purchase airtime when necessary. As mentioned earlier, this new allocation affects the type and portion of daily meals for the household. Beyond this small daily allowance, the non-income earning partner usually has little access to the rest of the husband's earnings and indeed, much of the extra earnings are unknown to the partner. Therefore, budgeting for the household head's mobile phone use or purchases remained a decision undertaken solely by the mobile phone owner. Household budgeting for the mobile phone has not changed the budgeting dynamics between family members.

5.8.2 Women Small business

Women more likely to have a mobile were those who attempted to contribute to the household income with their own new business. The focus group women who purchased their mobile through business profits felt more ownership of their phone than those with partner-purchased mobiles. The only household with a mobile phone ownership by a woman was the widowed woman who made an earning from her rental homes. The other households had women engaged in unpaid housework with

little use of the mobile. The one household with the kiosk business did use her husband's phone frequently to call her husband or relatives. The women who decided to start their own small kiosk or shop (for example, selling coal, bricks or food-stuffs), the profits that were made generally went back to the husband. Together, the couple decided together what amount went towards a new handset or the children in terms of school fees, clothes, or books. However, sometimes these financial decisions were not discussed between partners. For example, one woman in the focus group stated that she spent 60,000 UGX (\$ 36 USD) to make around 10,000 bricks (Focus Group #2, Woman #2, 2007). Her husband then sold all the bricks without her consent and in return gave her a jacket that she did not request. The wife never saw any of the profits. The decision of how profits were spent appeared to lean towards the decision of the husband. However, key informant woman benefited from the small business particularly when the husband travelled for long periods of time. She stated that she did not have to wait for her husband's wages (some times months before his return). She used the shop profits to stay in touch with the husband and buy "woman things" like vasaline. While in some instances women were still required to report back her profits to her husband, those wives with husbands engaged in long distance work were able to sustain their family's livelihoods with the extra income from their new small business. Small businesses for women, in many cases, have improved mobile phone ownership for the women within the households in Katote.

5.8.3 Spending Influenced by Status

Lastly, some of our interviewees stated that their spending choices were also influenced by the mobile phone standards set by their peers. One farmer said, "I compared mine with the phones of other people.... Theirs would have logbooks, which would help them know the functions on the phone. So I thought that I would buy a new phone that has a log book" (HH6, farmer, 2007). Another man stated, "...two of my friends have the same phone" (HH2, widowed man, 2007). The status symbol influenced spending behaviour of phones particularly among teenagers or college students. One college student from the focus group stated, "At the university without a phone, on campus, you look backwards" (Focus Group #1, Woman University Student, 2007) Spending behaviour as a result of perceived status did affect respondents in the village of Katote.

5.9 Conclusion

In conclusion, there have been clear changes in spending strategies by households through substitutions and intra-household asset negotiation in the village of Katote. These rural households, with its poor electricity, sanitation and water facilities and high education costs, continued to use their small variable incomes to build their assets mainly consisting of houses, farming land, and more recently, the mobile phone. The availability of mobile phones and its services were more than adequate in the village of Katote and even on meager wages, have allowed the households to afford phone calls to their family and business associates. While business opportunities have helped to increase some incomes to afford the mobile phone, most households have made sacrifices in their everyday lives in order to afford the communication costs. In terms of substituting transport costs, the mobile phone call mitigated vehicle cost during vulnerable situations and helped to develop use of more efficient transport services for business. Cheaper transport options were used to save money for mobile phone top-up. Secondly, households sacrificed daily shop-bought household items like sugar, cooking fat and soap for mobile phone services. Those with gardens were able to replace those missing meals with their produce while other homes were left to go without a meal that day. As for the mobile phone handset, the act of drawing savings was the dominant strategy rather than substitution. While savings and loan services did not change dramatically with the purchase of the mobile phone, informal savings groups were still utilised by some households. Finally, the household use of assets remains uneven and in some cases, exacerbated partner control particularly on mobile phone use. Income-earning partners limited use of the phone due to fear of misuse and cost of the call. Homemakers used their small food allowance to pay for their mobile phone use and have no information about the use of their partner's earnings. Women who started small businesses in Katote were able to justify their personal mobile phone use or purchase and felt genuine phone ownership than those with phones purchased by husbands. Peer pressure and status also had a hand in mobile phone purchase decisions. The spending strategies of substitution, informal savings and intra-household use were evident in order to accommodate the highly demanded communication needs clearly taking place in Katote and altering the everyday lives of these rural households and community.

Chapter 6: Analysis and Conclusion

6.1 A Tool for Development?

The recent introduction of mobile phone telephony in rural Uganda brings great change to its citizens. The country shows phenomenal uptake rates and the government is maturing in policy development and research in telecommunications. The price of the mobile phone handset and airtime services continue to drop dramatically in price and new mobile phone service businesses are sprouting throughout rural and urban areas as a result of improved legislation and establishment of a regulatory communications body. The Ugandan government reflects progressive policy to ensure services reaches even the most rural and remote parts of the country under compliance to universal service regulation. Even with universal service obligations, the question remains if the most vulnerable are able to participate in the new knowledge economy and what other familial barriers are hampering the outreach of communications to the poor. With many of Uganda's positive conditions for telecommunication policy, further research needs to address how the mobile phone industry affect rural household livelihoods.

As a result, this case study gathers initial evidence about the changing well-being of the rural disadvantaged with mobile phone access under the current Uganda environment. While this study only examines a small sample of household assets, it illustrates a case of how homes are utilising spending strategies on the mobile phone and other assets. These assets help to improve and to gain additional stock for the family which would eventually help to make that transition out of digital poverty. Measured through the changing spending patterns (namely substitution, financial service provision, and intra-household asset negotiation), the analysis reveals long-term benefits of this asset-enhancing tool, which improves emergency response to shocks and opens up opportunity for enriched income generating activity.

6.2 Sacrifices for Long Term Opportunity with Mobile Phone

While not clearly identified by international agencies as a tool to development, the mobile phones become long-term economic growth investments for the disadvantaged as were the examples of families in Katote. The findings reveal households who happily cope with unpleasant sacrifices such as reduction of food consumption or sanitation in a perceived short-term. For example, when one woman

was asked how she felt when she went without food for the mobile phone, she said, “I am happy because it is the phone that brings money” (HH3, wife of head, 2007). They hope that the mobile phone would improve their opportunities with income and jobs in the long-term. Regardless of whether the families are landless or property owners, both are highly vulnerable to making mainly short-term sacrifices of what is considered basic needs. However, in the long term, income security may improve if the mobile phones are utilised for productive work. The one example of improved monitoring of one household’s brick business already show better profits for the farming home. The majority of mobile phone subscribers believe that the mobile phone will increase their business opportunity and lower costs. The perception that the technology will provide future income and economic prosperity, thus justifies the manageable yet unpleasant loss for mobile phone ownership. There is a major willingness to pay now and see an improvement of their lives later. The perception of long-term improvement pushes both the landless and homeowners to invest in mobile phones.

One explanation for this is that mobile phones give people a sense of opportunity. No other expenditure in a household budget offers such potential for dramatic immediate change like this communication device. While improved access to food and sanitation would improve their livelihoods, if there is no mechanism to sustain or pay for these amenities, the poor remain in the same dire circumstances. Houses take a long time to build and large capital investments are not readily available to the poor. Improved food access and sanitation and new housing do not immediately help to improve job prospects nor move households to the next knowledge economy. All across Africa many developing countries are finding their citizens investing in mobile phone technology before meeting the needs of improved sanitation, water, health, housing and education. Citizens are creating a new form of development by improving the access to markets and jobs and are willing to make small short-term, unpleasant sacrifices if an economic improvement in their livelihoods can be seen with the mobile phone.

Mobile phone can also assist households when faced with unpredictable shocks. While the everyday sacrifices made for mobile phones can have either incremental benefit or detriment for the families, the greatest effects on poverty reduction that mobile spending had on a disadvantaged homes are during vulnerable shock experiences. Regardless of whether a landless or property owning households,

the mobile phone drives much of those shock costs down and allows families to better financially manage and cope with the situation, incurring lower travel costs, more efficient action, improved access to information and less trauma. Immediate outcomes of income savings and cost mitigation are found particularly during vulnerable situations like death or illness in the family. Security increases for all families through reduced loss of property. In a poverty dimension, the poor are constantly falling in and out of poverty as a result of frequent shocks. When a family is not able to quickly recover from one shock after another, those poor households appear to fall deeper into poverty. The probability of the family incurring drastic loss due to an unpredictable shock are mitigated and lowered when families are able to respond to the shock in more timely manners. One example of cost mitigation is in the study when the farmer's wife was able to contact her husband after a motorcycle accident instead of incurring high costs for a taxi and hospital visit. One wife recalls the ease of contacting her husband during pregnancy complications and having him take her home after the necessary hospital days (HH4, wife of head, 2007). A family's ability to lower the number of overnight hospital days or ability to avoid transport cost during desperate situations are major cost saving strategies implemented with the quick dial of the mobile phone to their family. The mobile phone presence has changed the extent to which the shock pushes the poor into poverty. The mobile phone helped mitigate the depth of poverty experienced and reduces many costs which used to burden the poor. In the case before mobile phones, families would spend tremendous cost on travel and time in contacting family members about a funeral or sickness. From the results, Katote households agreed that this communication device provided a means of timely responses, reduced surprises with available information, allowed the ability to multi-task and plan during shocks, engaged less time to physically search individuals and less emotional stress during the really difficult ordeals.

6.3 An Obstacle to Development?

While there are many positive impact the accompany access to mobile phones, there are also negative impacts. The idea that families are demonstrating sacrifices of basic needs such as food security and improved water or sanitation is, indeed, a potential obstacle to the perceived requirements for human development. The

individuals with mobile phones are choosing to meet needs other than food, and in this case, they are selecting phone airtime over food. The assumption of meeting basic needs like food and sanitation are being challenged by the mobile phone. People are not simply passing through predetermined development phases as one would intuitively believe. The high value of the mobile phone reveals households re-prioritizing their perception of needs and forthrightly, “jumping phases” or choosing to address their communication needs instead of basic needs.

The assumption also arises that when an individual possesses a mobile phone, their basic needs have already been met. In the findings, one starts to find examples of families who are making the choice to own and maintain a mobile phone before feeding their family or finding improved sanitation and water sources. The research shows that people themselves are expressing their true needs versus what one would assume are urgent needs such as food and sanitation. Citizens are challenging this pre-set linear way of thinking of motivation and human development.

The findings also reveal continuous gender imbalance of mobile phone usage and spending through unequal partner control of the mobile phone and reduced well-being from unprofitable phone calls. Certain family members perceive mobile phones are actually leading to poverty. They suffer under the exacerbated control of assets by the family’s income earner or household head. While some members are increasing their use of the mobile phone, the more vulnerable members feel that they are not benefited from the new technology purchased. For example, some focus group women were limited in usage of the phone or they were put under escalated control by their partners. Certain household members rarely little use of the mobile phone while the household head maintained possession of the tool. Women, for example, have calls completed on their behalf as partners who feared the overuse of their airtime. The fear may also come a perception of the head’s authority breakdown in the households of this conservative community. These negative perceptions appear to re-enforced asset control particularly with the mobile phone within the household. They also saw their own personal use of the mobile phone lead to little profits. Even in fruitful social calls with relatives, their own inefficient use of the tool directed the perception of mobile phones as not productive and in fact, inducing poverty unto their family. While the current study explored the current effects of asset and budget changes as a result of the mobile phone, the researcher suggests further work, which monitors these uneven gender trends particularly within these rural households.

Besides gender, this study would also benefit from longitudinal panel data over time which records changes of well-being levels under further diffusion of the mobile phone. Using some controlled household cases with mobile phones and others without, further studies can provide cost-benefit analysis of the two sample control groups. Are low-income households with mobile phones quicker to move out of poverty than those without? Secondly, while this is the case of rural families, further research could be expanded to exploring whether landless families in the urban setting undertake similar sacrifices for mobile communications. As this case study was limited to only one geographical area, such research could further investigate the asset portfolios and spending behaviour changes in other rural poor areas either in Uganda or other developing country regions.

6.4 Implications of the Katote Case Study

The implications of this study help to re-emphasize the need to explore beyond income poverty and examine new indicators such as asset portfolios. ICT4D studies can use this study as another socio-economic contribution to a generally techno-centric field. Further investigation on technology such as the mobile phone effects on poverty can assist the direction of a country's poverty reduction plan as well as the current thinking of development by international agencies. As mobile phone growth increases in developing countries, the intuitive thinking of basic human needs for the poor may need to be re-evaluated. If people are able to own or use a mobile phone yet choose not to improve the state of sanitation or water sources, it is a clear case to re-analyse the assumptions that currently exist within development studies of what is necessary within these household's livelihoods. Policy should understand the reasons for sacrifices being made by poor households and make provision for assistance if necessary. Provisions that help improve business opportunities as has been seen from increase of public call box businesses (as a result of eliminating business license fees for such business) must be promoted. Development agencies and government must thus see a paradigm shift of what they consider development and what indicators they use to judge whether a country should or should not be funded. Many agencies may find it a non-priority to examine ICTs when they assume, in their own development frameworks, that helping households with their basic needs is what is most needed. Yet in this example, one finds a strong

increase of mobile phone usage when families maintain the same dire development indicators of low electricity, poor water access and low education levels. A country with increasing mobile phone access may benefit on further study to monitor the speed of development changes of well being as a result of technology.

This study has suggested that the diversification of assets for the disadvantaged will help to improve the livelihoods. The alternatives for low-income families are limited. While the mobile phone is one option to enhance asset expansion, other asset accumulating initiatives must also gain fair publicity such as communal or cooperative garden plots or expansion of the free education program. The disadvantaged must also be part of the knowledge economy and not fall deeper in to the digital divide. An idea could be a “digital ark” or the coverage that all citizens are provided with the minimum technological skills and access, similar to a social safety net or a cargo net for assets. A “digital ark” would mean governmental strategies to address affordability and accessibility gaps for the digitally poor to at least reach the minimum level of digital assets to help enhance productivity and provide for a family’s sustainable livelihood. This study only cuts a small niche in an area of new research of ICT4D with emphasis on the development of people instead of technology. Further research is imperative to ensure that rural livelihoods are not left behind in this fast-moving environment of change towards the knowledge economy.

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