Calling for Better Crops:

An exploration of social upgrading through two mobile phone-based agriculture extension projects in Uganda

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A minor dissertation submitted in partial fulfilment of the requirements for the award of the degree of Master of Philosophy in Development Studies

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2012

COMPULSORY DECLARATION

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works, of other people has been attributed, and has been cited and referenced.

Signature:_____ Date:_____

Acknowledgements

I am abundantly grateful for my family and friends both here and abroad, my supervisor, and the endless cups of coffee that assisted me throughout this process.

Without my husband, I would still be staring at the Excel spreadsheets and wondering which formula to use.
Without my dear friends, writing sessions would have been far less productive or enjoyable.
Without my family, the editing would have been much more arduous and “data” would still be a singular word.
Without Brenda and James in Uganda, my experience would not have been as incredible as it was.
And finally, without my supervisor, I would have missed out on this opportunity to explore a new realm of study and would have gotten quite lost in the question marks along the way.

I could not have done it without any of you.

A special thank you to WOUGNET, AppLab Uganda, the Otika family, Capturing the Gains research group, Lydia Namubiru, Bakuku James, Katya Mauff, and so many others- you made this journey not only possible, but also enjoyable.

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Abstract

In recent years, mobile phones have become increasingly enmeshed in the daily routines of communities across the globe. This exponential swell of mobile teledensity in developing nations, especially in rural areas, gives evidence to mobile phones as being a contributing factor towards social and economic changes in local livelihoods driven by agriculture. In this study, any economic upgrading is organised under the concept of overall social upgrading. This dissertation investigates such evidence by exploring the social effects from the use of mobile phones through two agricultural extension projects in Uganda.

This primarily qualitative research is based on two case studies. The first, the Enhancing Access to Agricultural Information (EAAI) project, was established through WOUGNET and operates primarily in Northern Uganda. The second case study is the Community Knowledge Workers (CKW) project through Grameen AppLab. The CKW project has field workers throughout Uganda but is focused in the Western region of Kasese for the purpose of this research. The researcher conducted fieldwork in these regions and utilised a variety of qualitative methods to gather and analyse data including individual interviews and focus groups. Through these case studies, mobile phones' role in social and economic enhancement is examined and evaluated. Additionally, special attention is given to the role of the female farmer regarding the extent of access and use of mobile phones in these specific projects as it contributes towards their change in livelihood.

Through interviews, relevant organisational documents, and current academic literature, findings revealed that mobile phones do indeed affect social and economic changes as perceived by the rural Ugandan agriculture community. While mobile phone use in the case studies often illustrated a positive connection to a higher standard of living through the increased communication and the information received and shared among social networks, additional and unexpected factors are also highlighted. Interviews show that external factors strongly influence, and may even override, otherwise positive benefits of mobile phone access and usage. These factors include market and resources availability, mobile upkeep, and network issues, which are also necessary for economic or social upgrading. The implications suggest that farmers and organisations need to address these issues holistically and consider major influential

factors as they stand within the broader scope of mobile telecommunications for rural Uganda.

Chapter One: Introduction

Africa, while historically nicknamed the "dark continent" because of its mysterious nature to the early Europeans, is now beaming out an increasingly brighter glow from the screen of mobile phones. This rapid increase of mobile phone penetration is not only advantageous for leading telephone companies, but community members may also benefit through the wide range of social and economic opportunities made possible with this technology. Moreover, the increasingly integral role of mobiles for developmental purposes, particularly for project operations in rural areas, is changing the way communities gather and share information. For smallholder and subsistence farmers in Uganda, the recent availability of mobile phone-based agriculture services further provides these opportunities for changes in livelihood.

Thus, the primary research question asks the following:
How are mobile phones, used in conjunction with agriculture extension projects, contributing to rural Ugandan farmers' social and economic upgrading or downgrading?

Three sub-questions are used to provide a more complete platform for the core research question. These include:

- What are the tangible changes in welfare and personal livelihood after using the mobile phone service, according to qualitative study findings?
- What are other factors, external to the use of mobile phones in the agricultural extension project, which may contribute or have contributed to a change in livelihood?
- How does gender affect the use of agriculture-based mobile phone services?

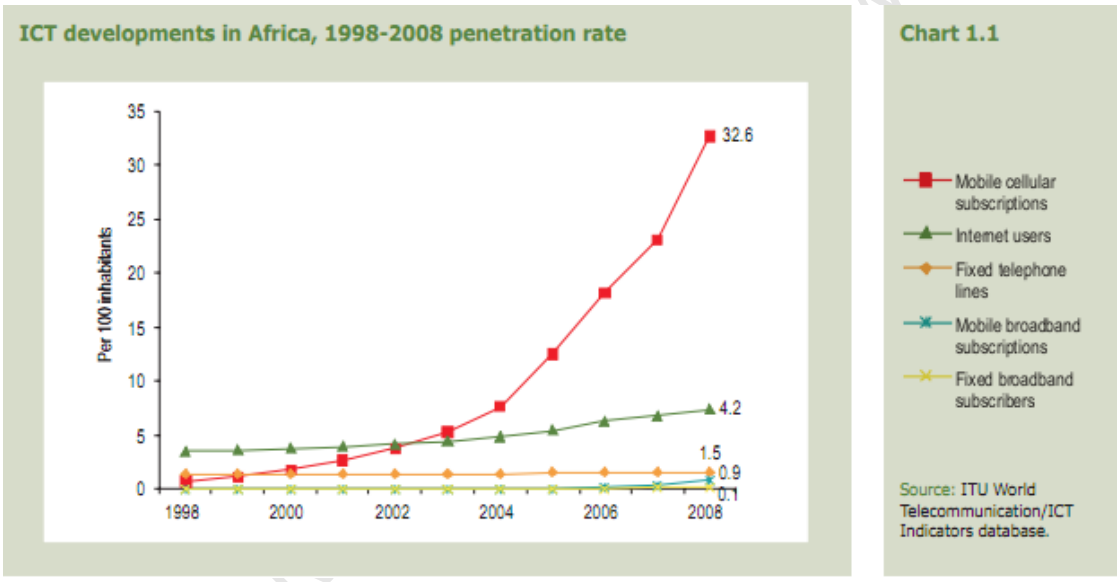
Integrated throughout this research is a special emphasis on the marginalised populations of Uganda, specifically women and rural communities. As rural women make up the majority of the small-scale farming industry in Uganda, the exploration of this position in the research is especially critical.

The following chapter provides a review of current literature in the field of mobile phones and agricultural extension initiatives to establish a holistic background to the study for the purpose of ultimately addressing the research aim. The background is organised to encompass the various facets of this topic and covers a range of relevant issues regarding mobile phone access and use. Following the description of concepts and a brief history of mobile phone penetration in Africa and Uganda specifically, the chapter shifts to include the various social and economic changes associated with mobile phone ownership and usage for rural communities. Finally, the use of mobile technologies in the agriculture sector then emerges as the primary area of research and is examined in the context of current global and regional initiatives.

This project contributes to the field of Sociology as it evaluates the current environment of mobile phone usage in a selection of agriculture projects in Uganda to determine how this widespread technology currently contributes to rural farmers' livelihoods.

Chapter Two: Mobility of Mobiles- The Spread across Africa

While the development and use of ICTs have increased on every corner of the African continent, mobile phones sweeping across the landscape at an alarming rate (Information Society Statistical Profiles 2009: Africa, 2009). In fact, this device is said to become the "planet's first ubiquitous communications platform" (OneWorld, 2009, 3). Moreover, on the economic front, recent publications predict that ICT spending across Africa will increase by 10%, bringing the total to USD25 billion by the close of 2011 (African IT Spend to Reach USD25bn in 2011, 2011). The following chart displays this recent swell of mobile phones on the continent:



(Information Society Statistical Profiles 2009: Africa, 2009, 1)

Yet even these illustrations of teledensity (number of telephones per capita) do not paint the complete picture (Kanellopoulus, 2011, 11). In rural communities especially, it is very common to informally share a mobile device between families, partners, friends, or neighbours (James & Versteeg, 2007, 121). This emphasises the importance of access over personal ownership, a vital component to determine the effectiveness of mobile phone usage for the purposes of social and economic development. Of equal importance to phone calls, Short Message Service (SMS) messages are a common route for information exchange among users (Information Society Statistical Profiles 2009: Africa, 2009, 17-18). Although

not the primary focus of this mobile phone research, it must be mentioned as an important feature regarding information dissemination. The following section establishes Uganda as the focal area of study and explores relevant features of its demographics and mobile phone penetration.

2.1 The Focus on Uganda

Uganda is a country of 33,424,683 citizens (2010 estimate), nestled between its five neighbouring countries of Kenya, Tanzania, Rwanda, the Democratic Republic of Congo, and South Sudan (Data: Uganda, 2012). Given the tropical climate and abundant water resources, it comes of no surprise that 68.9% of its 241,550 square kilometre land mass is considered agricultural land (Data: Uganda, 2012).

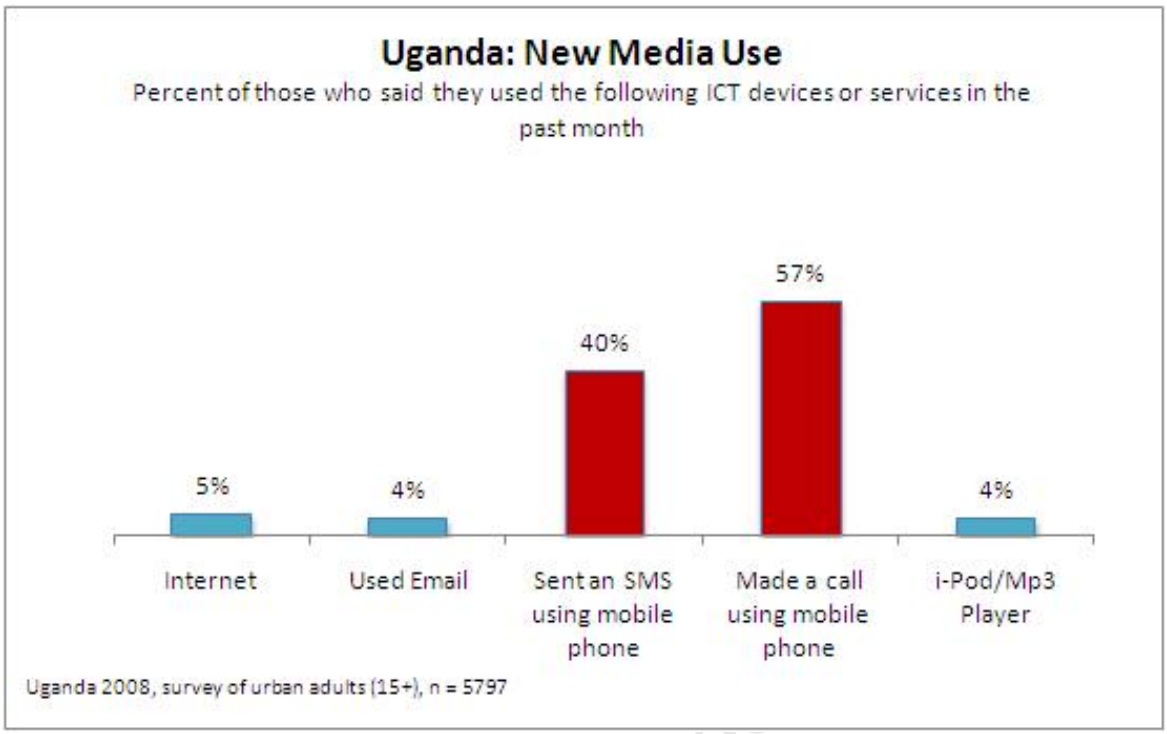
Uganda is predominantly a country driven by its rural agriculture sector, demonstrated by the fact that 80% of the population depends on agriculture as their source of livelihood (Okello, 2011). Furthermore, with 86.7% of Ugandans living in rural areas, it is the main income generator for the majority of the country (Rural Poverty in Uganda, 2010). This is largely the result of their strongest export crops comprising of coffee, tea, cotton, and tobacco (Uganda Exports, 2011). Within the country's borders, many small-scale and subsistence farmers generate necessary foodstuffs to feed their families and sell in local markets. Given that 18% of its land mass is covered by lakes, fisheries and livestock make up a significant portion of the agriculture scope as well (Fisheries Resources, 2012). Although information is not yet available through the official Ugandan government sources, the Food and Agriculture Organisation values Uganda's agricultural export value at 878 million USD (Uganda, 2011). In light of this, it can be argued that any device that may enhance production and farmers livelihoods is highly relevant and well-worth further exploration.

In this region specifically, Aker states that "less than 10% of the population had mobile phone coverage in 1999, increasing to over 60% of the population in 2008" (Aker and Mbiti, 2010, as quoted in Aker, 2011, 6). In actual figures, mobile phone subscribers have amplified from 16 million to 376 million between 2000 and 2008 (Aker, 2011). Especially

striking is the telephony landscape prior to the introduction of mobile telecommunications. According to a study by Burrell and Matovu, phone service of any sort was essentially non-existent in rural Ugandan villages before the mobile phone (2008, 13). This jump of coverage availability and subscribers has caused a wildfire to expand across the region and opened up a range of possibilities for economic and social change.

Uganda is now in the thick of this wildfire spread and is less than a decade behind the global mobile penetration rate (Gyory, 2010, 4-5). Within the region, however, it has not yet reached the same height as its African neighbours. Statistics released by the United Nations reveal that Uganda has lower mobile phone penetration than the rest of Sub-Saharan Africa with fewer than 14 mobile subscriptions per 100 people (Gyory, 2010, 1). Despite its slow rate, the expansion-to-time ratio is highly noteworthy. In just eight years, mobile phone subscriptions increased from 0.5 per 100 people to 26.8, according to the 2009 ITU report (Gyory, 2010, 4-5).

The issue of access in Uganda was briefly addressed by national surveys conducted in 2007 and 2008 when they found that the number of households with access to a mobile phone has increased from 21 % to 39 % (Mobile Communications in Uganda, 2010, 2). Household access among Ugandans with a low-socioeconomic status "tripled from 2007 to 2008 from 5 % to 15 %" (Mobile Communications in Uganda 2010, 3). The extent of this increase is illustrated by the following chart, which demonstrates the percentage of respondents who used specified ICTs in the month prior to the survey:



(Mobile Communications in Uganda, 2010)

The Uganda Communications Commission (UCC) attributes this rapid growth to increased coverage and new competition in the mobile phone service market, which allows a broader population to acquire phones at competitively lower rates (Mobile Communications in Uganda, 2010, 1). The first company to enter into this market in Uganda was Celtel, also known as Zain, in 1994. They remained the only mobile phone company until MTN and Uganda Telecom entered the scene in 1998 and 2001, respectively (Mobile Communications in Uganda, 2010, 1). Since that time, numerous other companies have emerged, each with a target market and a variety of service offerings. More recently, MTN Uganda, Orange Uganda Limited, Zain Uganda Telecom Mobile, and Warid Telecom now compete to hold the position of top mobile service provider in Uganda (Communications in Uganda, 2009).

Some companies specifically target lower-income Ugandans with tailored options for a limited budget. Smile Telecom, for example, offers their customers a personal number and identification number in order to use any Smile-sponsored pay phone, stall, or kiosk

(Mobile Communications in Uganda, 2010, 2). These options mean that the individual does not need to own their own handset in order to experience the benefits of mobile technology. Innovations like this continue to expand options for both rural and urban community members and companies alike. Telecom companies recognise that while not everyone can afford a handset, they should not be disqualified from the option of quick and easy communication (Mobile Communications in Uganda, 2010). Thus, this decrease in cost and increase of service options to more rural areas have allowed less affluent citizens to take advantage of this service and the economic opportunities available therein.

It may then be concluded that the widespread availability of mobile phones is changing the way that rural communities gather and spread information. According to Aker, mobile phones' rapid and highly influential reach offers a "unique opportunity to transfer knowledge" by way of information systems through public and private organisations (2011, 1). Moreover, this sharing and dissemination of knowledge is a key contributor for any social or economic change. The upcoming section explores these potential "side effects" of access and use of mobile phone technology before leading into their developmental uses within social service organisations and finally within Uganda's most prominent sector, agriculture.

2.2 Social and Economic Side Effects

This section specifically highlights the social and economic opportunities associated with mobile phones towards upward development. These findings, based on current literature in the field, also serve as a precursor to mobile phone's developmental uses, which are subsequently addressed.

Numerous researchers, such as Hudson, Jagun, Heeks, and Whalley (2006; 2007) have speculated that ICTs can "aid greatly in rural development and poverty reduction within developing countries due to an increase in local people's ability to obtain information for sound decision-making" (Martin & Abbott, 2010, 2). This is made possible through four major categories in which ICT benefits fall, according to Hudson (2006). In his words, these categories include and are described as the following:

> (1) *efficiency*, ratio of output to cost (e.g., gathering information to improve agriculture yields); (2) *effectiveness*, increased quality of products, services, and organizational functions; (3) *equity*, distribution of development benefits to all areas; and (4) *reach*, the ability to communicate regardless of time or geographic boundaries.
>
> (Martin & Abbott, 2010, 12)

These benefits aptly describe the overall impact potential of ICTs in both social and economic development. According to UNDP's "Making Technologies Work for Human Development" report in 2001, mobile technology "is a pervasive input to almost all human activities: it has possibilities for use in an almost endless range of locations and purposes" (35). ICTs are also a key element to consider for the achievement of the Millennium Development Goals (MDGs). According to Islam et al, there are current ICT projects dealing with each of the eight goals (Islam, Mrelli, Noronha, & Rahman, 2006). The aim is that the infusion of ICT within these goals will make them not only more attainable, but also more accessible to a larger portion of the population (Islam, Mrelli, Noronha, & Rahman, 2006).

Ultimately, Ndung'u and Waema regard the developmental importance of ICTs, and specifically mobile phones, as being able to "enable knowledge, access, accumulation, and dissemination" in communities so that this access ultimately "enables development in other dimensions" (2010, 17). Several noteworthy articles support this claim that mobile phones are a key component to bridge the gap from a "resource need to resource access" (Calling an End to Poverty, 2005). Thus, like the use of ICTs in the United Nations' Millennium Development Goals, mobile telecommunications have enormous potential to a make positive contribution in the social realms of both macro and micro levels of society.

In addition to boosting social standards, mobile phones also "significantly reduce communication and information costs for the rural poor," thereby enhancing their economic viability as well (Aker, 2011, 2). As such, this beneficial combination holds the potential to both enhance the road to economic improvement as well as lower the price tag to get there. Recently, numerous studies and reports have been produced to provide a

more complete picture regarding the economic effects of mobile phones. In fact, in macro terms, a developing country with more mobile teledensity has a positive correlation to higher GDP growth (Vodafone, 2005, 2).

A study by Waverman et al. illuminate this positive correlation between mobile phone ownership and an increase in GDP with as much as 10% growth in a mobile network correlated to a 0.59% growth in GDP for developing countries (Waverman, Meschi, & Fuss, 2005). This result is based on a number of reasons, but increased availability of market data, less time spent in unnecessary transportation, and rapid information relays are a few of the chief contributing factors (Duncombe & Heeks, 2001, 19). Complementing these economic side-effects of mobile phones, the following paragraphs address the implications of access through a lens of technology costs, time saving, and effects on employment and educational opportunities. Each of these items is highlighted with respect to the case studies and fieldwork findings explored in subsequent chapters.

On the cusp of this economic research is a 2007 study by the Research ICT Africa Network which revealed that 93.7 % of their respondents believe that having a mobile phone makes life easier regarding time and saving on additional costs (2010, 11). Additionally, 65.6 % commented on its usefulness in obtaining a job while nearly as many, 60.1 %, use mobile phones to run their businesses (Ndung'u & Waema, 2010, 11). Studies about mobile phone usage in Uganda have also exposed relationships between this technology and improved business, employment, school attendance, and literacy (Gyory, 2010, 1, 3-4). This is further supported through the findings of Aker and Mbiti, who state that mobile phones offer "several advantages over other alternatives in terms of cost, geographic coverage and ease of use" (Aker and Mbiti, 2010 as quoted in Aker, 2011, 7). Moreover, Ewing completes this claim with his statement that a "growing body of evidence suggests that access to communications boosts incomes and makes local economies far more efficient" (Jack Ewing as quoted in Otto, 2011). This may be due to mobile's nature to provide a "platform for innovative solutions to local problems" (Otto, 2011).

An additional noteworthy economic feature of mobile phones is evident through the popular mobile money services now spread across the continent. Mobile payment services have exploded in popularity throughout eastern Africa and the continent as a whole. Essentially the mobile money platform allows users to send and receive money through their mobiles via unique codes for a small fee. This allows small-scale farmers, for example, to send money to their children who are away at school without the hassle and security risks of sending cash through traditional means. Today M-Pesa has more subscribers than there are bank account holders in Kenya, which sufficiently proves their widespread economic influence and the mobile's potential to tap into previously unavailable financial opportunities (Hughes & Lonie, 2007). For women, opportunities like these are not always so straightforward. Examined in the next section, gender plays a recurring role throughout the research.

2.3 Mobile Phones and Gender

The issue of gender, as related to the digital gap, is a subject of great interest to both the public and private development realms. With the agricultural sector of Uganda dominated by small-scale and subsistence female farmers, it is all the more imperative to consider gender in this context as it continues to influence the overall research. With the influx of ICT availability, this section explores the traditionally male-dominated field of technology as it affects women's ability and ease of access to these tools.

In Uganda, women account for as many as 70% of the agricultural workers and Uganda (Accenture, 2011, 14). By placing this amount alongside the previous figures about mobile phone penetration in the area, there is much room for overlap and mutual impact. However, the extent of this overlap is highly dependent on women's opportunities for access and use of this technology. Regardless of their significant contribution to the food security in countless rural villages, scholars claim that "men continue to dominate decision-making, capacity development and content development" (Hagan & Lal, 2005, 28). Therefore women remain marginalised and struggle to attain a level of access that could more easily lead to increased opportunities and resources.

Similar to the previous sections of mobile phone "side effects", many scholars have confirmed the potential effectiveness of mobile phones in their gender-specific research. However, benefits of this technology are difficult to gather in the face of limited access. For many women in developing countries, including Uganda, access limitations are filtered down to traditional and practical constraints. According to Primo, "socially and culturally constructed gender roles and relationships play a cross-cutting role in shaping- often limiting- the capacity of women and men to participate on equal terms in the information society" (2005, 144). This unequal footing is a primary cause of women's slower rate of technology adaption and use than their male counterparts. These gender roles are further concreted into the daily life of certain traditional communities through the residual belief that men, once they have provided the dowry payment, have ownership of the woman and all the elements of her life therein (Bakesha, Nakafeero, & Okello, 2009, 143). These elements may include, but are not limited to, "time, access to information and participation in politics, social groupings and trainings" (Bakesha et al., 2009, 143).

These elements result in increased difficulty for many women to own a personal handset, Ekine claims (2011). Therefore, they are often required to borrow or share mobile phones between family members and neighbours. While this technically gives women access to a mobile phone, the freedom of use, privacy, and opportunities to further technological skills are greatly restricted in this scenario. As a consequence, women may not be able to access as many opportunities to participate in mobile technology.

Additionally, Primo asserts that patriarchal societies "go beyond issues of technological infrastructure" (2005, 152). In conjunction with social inequality between genders is the lack of educational opportunities provided to women and girls, such as ICT training or literacy. An absence of training opportunities and a widespread presence of illiteracy are two of the "most serious barriers that prevent them from entering the information economy" as "language and basic computer literacy are prerequisites for women and girls to benefit from the use of ICT for education" (Primo, 2005, 152). These, combined with the heavy domestic workload and responsibilities, can become "bottlenecks to their

participation in development processes" if not adequately addressed by appropriate measures (Hagan & Lal, 2005, 28).

There is inconclusive evidence regarding women's likelihood to ask for assistance via mobile phone to a man, rather than another woman. In consultation with experts, be they health, agriculture, or otherwise, Martin and Abbott found no significant difference in the gender of the caller verses that of the consultant or expert (2010, 6). However, other studies suggest that women may feel uncomfortable by approaching men outside of their family or community relationships (WOUGNET, Gender, ICTs, and Rural Livlihoods, 2010). Although this cannot be determined conclusively either way, it is certainly a feature to consider when discussing women's access to mobile phones.

A more apparent and less culturally entangled obstacle to mobile phone access is electricity and the issue of charging the mobile's battery. In nearly every corner of Uganda, electricity blackouts are commonplace; this is true even of urban areas. In the most remote regions, there is no electricity grid whatsoever and although solar power is possible, it is not a consistence source of power during the heavy rainy seasons. To charge a phone is a process that can take up to several days as it often requires a return trip in the same week if no one else is passing through. For women who are expected to keep up with their household duties and maintain the crops, this time-consuming travel is a formidable task. Thus, unless women have a strong familial or communal network to more easily access these resources, even the seemingly simple task of charging provides a significant obstacle.

Yet these obstacles and perceived limitations do not mean that women fail to benefit from the mobile phone. On the contrary, studies show that resilient women are finding ways to incorporate new methods of social upgrading into their daily routines and tasks using mobile phones whenever possible. This often begins at the familial level. In the words of Macueve et al, the "mobility and flexibility of the mobile phone provides the capability to maintain regular contact with families regardless of distance; as a result, family links and support networks are strengthened" (Macueve, Mandlate, Ginger, Gaster, & Macome, 2009, 29). In addition to strengthening family ties, women-to-women social networks are serving

as a unifying feature of various women's groups. Other women, such as the members and participants of Radio Ada in south-eastern Ghana, have taken ownership a step further to become "agents of their own opportunities" as they utilise ICTs to work for them and other women farmers, rather than be subject to male-dominated radio programming (Odame, 2005, 20). Although this unique initiative is radio-based, it remains a positive example for women to configure ways to use ICTs for their personal and communal needs.

While gender imbalances still exist between sexes and many women still face difficulties in attaining equal access of mobile phones as a result, there have been recent promising studies that suggest positive change is happening. The 2010 Mobile Communications in Uganda report says that women's access to mobile technology has more than doubled in recent years from 16% to 34% (Mobile Communications in Uganda, 2010, 2). In another study focusing on Uganda, Kayabwe and Kibombo report that 73.7% of women consider themselves joint-decision makers in the economic decisions of the family (Kayabwe & Kibombo, 2003, 80). Based on their focus groups and in-depth qualitative analysis, they concluded that men are indeed allowing women more participation than before in Uganda (Kayabwe & Kibombo, 2003, 25).

Greater female participation in this realm may lead to numerous positive outcomes, according to various reports. Accenture's 2011 study, for example, states that allowing women access to conduct financial operations through the mobile phone will likely "enable more efficient allocation of rural household spending" (Accenture, 2011, 16). Future participation is fostered through efforts to include both sexes in each stage of a mobile phone-based application or initiative. From interviews with stakeholders in an upcoming radio-mobile partnership, Kayabwe and Kibombo determined that women and men should hear each other's sides during the process, rather than focusing solely on the female opinion even if it is a female-focused initiative (Kayabwe & Kibombo, 2003). This includes not only men from the local community, but also husbands of the women involved. Such practices are becoming increasingly commonplace within development aid organisations as they seek to combine the beneficial uses of ICTs with women's participation and empowerment.

2.4 Mobile Phones in the Development Sector

In the recent years, mobile phones have been cited as the ultimate "leapfrog technology" to bypass the intermediate steps traditionally accepted to continue on the development trajectory (Rodgers, 2009). However, this increase of access is not only affecting the women, communities, and businesses of rural small-scale farmers, but has also become intimately tied into development aid organisations. In fact, knowledge transfer via mobile phones is now enmeshed into innumerable governmental and non-governmental organisations alike as part of their daily project operations. Whether the phone is used for internal communication and monitoring purposes or as an extension tool to reach project beneficiaries, it has become an integral component in the overall process. The development initiatives addressed in this section are aimed at the rural sector and specifically in agriculture. By infusing development with ICTs, organisations are expanding the possibilities of their reach and impact of poverty-reducing initiatives.

Decades of research have been dedicated to understanding and perfecting poverty alleviation methods, but few are as directly linked to emerging opportunities as ICTs. According to Kanellopoulus, mobile phones exemplify "spatially-sensitive information strategies" to aid anti-poverty programmes (2011, 11). The opportunities associated with this ICT are widespread in the public, private, and governmental arenas. In the words of Mutula and Mostert, "information and communication technologies are critical in fighting poverty and uplifting the socio-economic and living standards of the people" (2009, 38). They continue by saying that ICTs hold the potential to "empower people to overcome development obstacles, address social problems, and strengthen democratic institutions" (2009, 38). Additionally, the 2003 World Summit on the Information Society determined that ICTs have "fundamentally brought new ways of creating knowledge, educating people and disseminating information, conducting economic and business practices, running government, engaging politically, providing speedy delivery of humanitarian aid and healthcare, and improving the living standards for millions of people around the world, among others" (Mutula, 2007). With such backing, it is easy to understand why countless

organisations have wrapped their operations around the centrality of ICTs, especially mobile phone technology.

2.5 Mobile Phones in Agriculture

One sector that has recently witnessed the emergence of social and economic changes through the developmental uses of the mobile phone is subsistence and smallholder farming. Not only are extension workers discovering the convenience and effectiveness of staying connected via mobile, but also farmer-to-farmer and farmer-to-market interactions are simplified through this technology. This section briefly examines the increase of mobile phone-based applications in agriculture while focusing on the change in livelihood and opportunities for the farmer, and discusses the practical implications of using mobile phones in the field. Special emphasis is given to subsistence and small-scale farming in Uganda. The section concludes with an examination of the developmental uses of mobiles within agricultural extension programmes to serve as a platform of introduction to the case studies.

The influx of mobile phones in rural agriculture-driven areas represents "one of the most profound changes in rural Uganda and many other developing countries in the past decade" (GSM, 2008 as quoted in Martin & Abbott, 2010, 1). This operates from the fact that prior to mobile phones there was little or no infrastructure in place for telecommunications whatsoever (Martin & Abbott, 2010). With the now unavoidable presence of mobile phones, even in the most remote villages of Uganda, the potential to improve access to agricultural-specific information can be made a reality, researchers claim (Aker, 2011; Mesiku, 2011).

Moreover, rural farmers themselves have reported a number of benefits resulting from mobile phone use in their agriculture businesses. Of these, travel costs, time, and market access rise to the top positions (Martin & Abbott, 2010, 8). With the option to call ahead and prearrange meetings for seed and buyer collection, farmers are able to avoid unnecessary trips to trading centres or faraway markets. Additionally, farmers can now replace travel with a simple phone call to gather pertinent information such as daily

market prices. Respondents stated that their mobile phones "provided monetary saving over what would normally have been spent on travel" (Martin & Abbott, 2010, 5-6). Simply by using this technology, farmers are now able to call to gather necessary information and can save on expensive and time-consuming transportation.

Thanks to the mobile, opportunities for increased communication and information sharing with other farmers are also now possible. This, according to Martin and Abbott, leads to the perceived increases in "contacts and opportunities," "market access," and finally, increases in "efficiency resulting in greater output" (2010, 8). It is apparent that the travel time, costs, and market access benefits highlighted in recent reports and surveys are mutually dependant. Their links demonstrate that one will not affect the farmer in isolation, but rather that each has a relationship both to the mobile and to each other.

A recent study by Dr. Kenneth Masuki of the World Agroforestry Centre tentatively confirms these findings of mobile phones' effectiveness for information dissemination. His research in south-western Uganda tracked farmers' uses of the mobile phone for the purpose of gathering information. He concludes that mobile phones "facilitate farmers' access to markets as well as build social capital" (Mesiku, 2011). He generates these findings from numerous farmer interviews, in which 80% of interviewees believed that the mobile phone has improved their livelihood (Mesiku, 2011). Ultimately, he concludes that these farmers consider the mobile phone to be an "easy, fast and convenient way to communicate" (Mesiku, 2011).

A final component to consider with mobiles' use in agriculture is the aforementioned popularity of mobile money applications (Hughes & Lonie, 2007). This is especially evident in Sub-Saharan Africa for small-scale farming communities. These opportunities include, but are not limited to, the mobile payment system (like MTN's Mobile Money or Safaricom's M-Pesa), micro-insurance system, and the micro-lending platform (Accenture, 2011, 15). All of these services, when used by smallholder farmers, have the potential to improve outputs and decrease risk for "losing it all" when crops fail. This tool, combined with increased information availability, each deliver nearly "40% of the total estimated increase

in agricultural income" (Accenture, 2011, 7). Such a dynamic cooperation between financial and informational services "unlocks productivity potential" as never before (Accenture, 2011, 8).

An element to note when discussing potential factors for improved agricultural outputs relies on the information sharing among farmers. This is best seen through the countless farming groups and cooperatives across Uganda. Oftentimes farmers join these farming groups or cooperatives in order to pool resources, share best practices, or participate in micro-lending opportunities. In addition to the typical benefits of group participation and involvement, recent studies propose a positive correlation between group membership and mobile phone usage, specifically in agriculture. This discovery suggests that "farm group membership is associated with knowledge transfer" (Martin & Abbott, 2010, 5). The report further states that 82% of survey respondents used mobiles for the purposes of farmer mobilisation, such as meeting and training coordination, and for "agricultural inputs" from suppliers, agriculture-based organisations, and other local farmers (Martin & Abbott, 2010, 5-6).

As a result, farmers reported that they "no longer missed meetings or trainings because they were always available through the mobile phone" (Martin & Abbott, 2010, 5-6). In addition to these benefits of farm group membership in conjunction with mobile phone usage, the report found that members were "significantly more likely" to consult agricultural experts through the phone than their non-member counterparts with the staggering comparative figures of 51% to 19% (Martin & Abbott, 2010, 6). With such findings in mind, it may be concluded that farm group involvement combined with access and use of a mobile phone may lead to greater outputs, decrease risks, and improve the overall agricultural business of the farmer.

In addition to farming groups, mobile phones have been adopted within agriculture extension programmes as well. According to Aker, "there has been a proliferation of mobile phone-based applications and services in the agricultural sector" since 2007 (2011, 2). Although she does not specifically pinpoint Uganda, the country has witnessed this rise

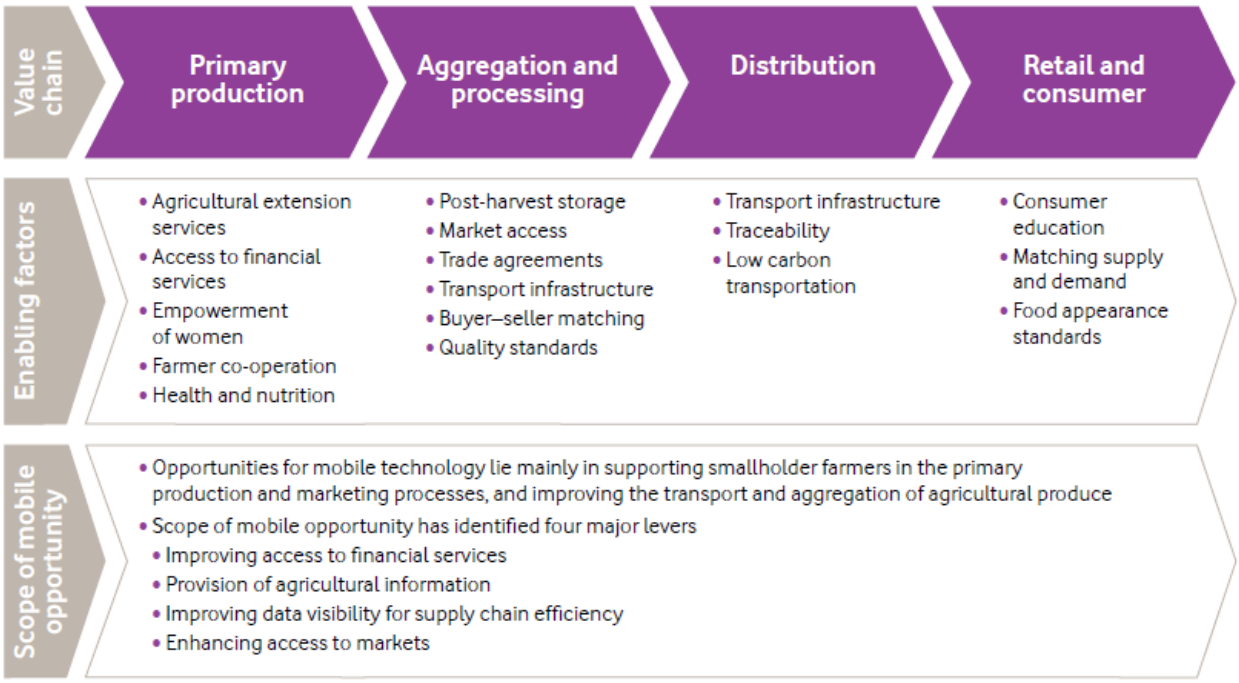
firsthand through ICT-focused organisations like Grameen AppLab and I-Network, just to name a few. These mobile phone applications can now provide agricultural best practices and new methods to farmers in a timely, more cost-effective manner (Accenture, 2011, 19).

Aker establishes four primary categories of ICTs in agriculture initiatives (2010). These include voice-based information delivery services, radio dial-up and broadcasts which allow farmers to send SMS enquiries and receive responses through a radio programme, and other SMS-based extension services (FARA, 2009 as quoted in Aker, 2011, 10). With SMS-based initiatives, however, it is more difficult to explain complex farming techniques and requires a certain level of literacy (Aker, 2011, 11). Due to low literacy rates in the research scope and issues of privacy surrounding SMS messages, the chosen case studies do not focus on SMS as the primary platform for information dissemination. The fourth of Aker's ICT agriculture initiatives, e-learning programmes, generally employs the use of telecentres or internet kiosks in order to pass information to farmers (FARA, 2009 as quoted in Aker, 2011, 10). Of these four categories, it is of interest to note that mobile phones have the capacity to be a vital component in each.

Beyond the overarching categories and examples described here, researchers continue to highlight the importance of radio for information dissemination regarding social and livelihood issues. Although often discounted as an outdated ICT, radio permeability remains key to any widespread information sharing, especially in rural areas. Within agricultural extension programmes especially, radio and mobile phones have established a solid partnership. Mutula emphasises the prevalence of radios in Africa, calling it a "low-cost technology" that could enhance access to information (2007, 482-483). Throughout the research, radios are a feature that continue to resurface and are thereby an element to be considered alongside mobile phone usage in order that both are made more beneficial for the farmer's social and economic opportunities.

While many organisations choose to insert the mobile phone in the direct line of agriculture extension programme operations, these enhancements to information gathering can assert their influence at various stages throughout the process. The following

chart illustrates the possible developmental uses of mobiles within the agricultural supply chain:



(Accenture, 2011, 10)

At present, there are already applications and initiatives fulfilling nearly all of the stages in this supply chain on a global scale and producing significant results. One of the leading mobile phone application hubs in India utilises a voice-based application for farmers in the rural countryside called LifeLines India. This Mobile4Good initiative is one of the many ICT4D (ICT for Development) programmes started by OneWorld UK. In this programme, farmers call the main line to ask their specific farming questions and are given a reference number. The following day, they call again to receive the expert's answer. Although it is a 24-hour turnaround time, the LifeLines India program boasts highly pertinent and tailored responses to even the toughest questions due to their large knowledge bank from the volunteer agricultural experts (OneWorld, 2009, 19).

Another illustration is much closer to home. The Ethiopian Livestock Market Information System operates simple applications built on a complex foundation. This project, currently operating in Ethiopia, Kenya, and Tanzania, provides real-time livestock price and volume

information to their various stakeholders in order to better facilitate marketing decisions (Ethiopian Livestock Market Information System). This operates under the assumption that access to better information will lead to better decision-making. In order to access specific market data, the farmer sends a request via SMS with the necessary items of information regarding cattle size, geographical location, and so on. The purpose of this project is to link market information with an automatic collecting system and disseminate timely and accurate market information for farmers spread across the most remote areas of Africa who depend on livestock as their source of income (Ethiopian Livestock Market Information System).

The literature has thus addressed the spread of mobiles across Africa and within Uganda specifically, the influence and role in the social and economic livelihoods, agriculture extension programmes and developmental uses, as well as the relationship between ICTs and gender. The following chapter places this foundation within a conceptual framework through which to examine the research.

Chapter Three: Conceptual Framework

3.1 Key Concepts

In order to foster consistency throughout the project, several concepts must be addressed and defined within the context of this research. The term "social and economic upgrading or downgrading" is used throughout as the key filter for determining the effect of mobile phones in the highlighted agriculture extension projects. In this study, economic upgrading or downgrading is considered within the broader scope of social up- or downgrading, given that any economic changes in livelihood will inevitably affect social standards. While an increase of crop yield results in higher income, referred to as "economic upgrading," the ultimate outcomes such as better schooling options or more access to ICTs are socially-oriented. The report aims to unveil how social upgrading is seen in the lives of Ugandan farmers while focusing on female and rural farmers. Thus, references made to "economic upgrading" are understood to be conceptualised beneath the theme of social upgrading.

This overarching theme of "social upgrading," then, is described as the incremental growth of social capital through access to resources, social networks, and opportunities for improving the current standard of living. Such components contribute to an overall increase in well-being for the individual or community affected by "social upgrading."

An important form of social upgrading in this study is the phenomenon of "social networking." While the theory of social networking is rapidly expanding in recognition and influence, this research focuses on the concept rather than the theory (Ethier, 2006; Lugano, 2008). Moreover, it will be described within the confines of mobile phone networking specifically. Wasserman and Faust state that a social network "consists of a finite set or sets of actors and the relation or relations defined on them" (as quoted in Lugano, 2008). In the context of this study, the farmers are the actors who utilise mobile phone technology to gather and spread information among family, friends, fellow farmers, and other members of the farm group or cooperative. This social network is "inherently multidimensional" and "multiplex" because it reflects the similarities among its components such as kinship, community, or shared profession (Lugano, 2008; Abraham, I.,

Chechik, S., Kempe, D., & Slivkins, A, 2012, 1). In this case, such similarities are centred on the agriculture sector and the community as neighbours or fellow farmers. The bi-directional network of farmers sharing information gives rise to further social capital and opportunities for empowerment by otherwise marginalised populations (Ethier, 2006). This social capital from a network consists of "the ability to draw on the resources contained by members of the network" (Ethier, 2006, 1). Moreover, it serves as the undercurrent to access the resources necessary to improve farmers' overall well-being. The concept of "social networking" is therefore demonstrated by the use of mobile telecommunications in order to benefit the farmers, especially women farmers, and increase the availability of information flow amongst them, often in the setting of a farm group or cooperative.

"ICT" is another necessary term to clarify for this research. This acronym for "Information and Communication Technology" is extremely broad in its fullest definition, referring to anything from mobile telecommunications to the World Wide Web. Throughout the dissertation, "ICT" may refer to any of these technologies. Although the internet and broadband capabilities are a vital and expanding medium in developing countries and are included in the umbrella term of "ICT", the penetration remains low in rural areas and thus not included as a topic of research in this particular study. Even while not a focal point, the concept of "ICT"s is cited frequently throughout the research by external sources and often includes mobile phones within their scope.

Additionally, "poverty" carries a burden of ambiguity that must be defined according to the research. Hence, poverty is defined as both the lack of access to information and resources, specifically that which is provided through social service organisations and providers, as well as a "deprivation of capabilities" which stunts the individual's ability to increase their own potential (Kanellopoulus, 2011; Sen, 1999; Bakesha, Nakafeero, & Okello, 2009, 150). According to Callan et al, this angle of poverty is also intimately tied to social exclusion because it results from a lack of access to necessary resources (Callan, Nolan, & Whelan, 1993). Ringen asserts that poverty encompasses "'both sides,' which include low resources and the consequences of having low resources" which lead to exclusion from the "expected

and required" standard of living (1986, 127). The inverse of this is access to information and increased knowledge about opportunities for an improved livelihood throughout all sectors of society (Cullum, 2010). This definition of poverty remains consistent throughout the study.

Lastly, the term "development," much like "poverty," has vast a range of definitions. In this case, it is partially defined by the ideas set forth by Amartya Sen in his Capabilities Approach. In the context of this study, it is not a pre-determined linear motion that countries and individuals must follow in order to reach a more complete, or successful, state of being. On the contrary, development refers to the "process of expanding the real freedoms that people enjoy" and expanding people's capabilities to "lead the kind of life they value" (Ndung'u & Waema, 2010, 3-4; Sen, 1999). While Sen considers development to be "achieved" when the individual experiences freedom to choose and pursue their own opportunities, this research also emphasises resource access, an element underplayed by the Capabilities Approach (Sen, 1999). Without first having an opportunity to access the necessary resources, no individual or community can reach a level to pursue freedoms in the manner put forth by Sen. It is through this lens that mobile phones are explored as a dissemination tool for accessing resources and expanding freedoms for development.

3.2 Theory

With the parallels of poverty and development alongside the understanding that the present inability to gain access to social opportunities frustrates development, Sen's Capabilities Approach and social exclusion theory are applied to complete the conceptual framework for this research. Not only are they relevant to the situation of mobile phones in agriculture projects for Ugandan farmers, but traces of these theories in action are present in the daily operations of both case studies as well. This section first describes and defines the conceptual context in which the research occurred and then discusses the framework in the context of the two. The findings and final discussion chapters both utilise this theoretical lens as the median through which to examine the core research question.

3.2.1 Capabilities Approach

Amartya Sen's Capabilities Approach emphasises the importance of a person's opportunities for freedoms through the choices they make. Moreover, this access is the central core of the development process (Sen, 1999). While Sen does not stress the importance of the resources necessary to pursue these opportunities in the first place, this study considers such a factor to be invaluable to the overall conceptual framework. Provided that the individual or community does have the resources to access opportunities, such freedom allows them to increase their ability to benefit not only themselves, but also their wider communities (Sen, 1999, 18). In this context, freedoms are defined as the opportunity to choose to do or have or be something as well as the opportunity to not choose any of those things, known as the "agency aspect" of the individual (Sen, 1999, 18). This is made possible through the capability to achieve certain functions, whatever they may be. More specifically, freedoms encompass all realms of life such as educational freedom, economic freedom, and social freedom. According to Sen, different freedoms also mutually strengthen others, thereby highlighting the interconnectedness and necessity of each (Sen, 1999, 10). Conversely, unfreedoms or the lack of opportunities for certain freedoms, also affects other obstacles to development (Sen, 1999, 4-5). According to Sen, social unfreedom "can also foster economic unfreedom," which reflects the interdependency of the two features as discussed through social upgrading or downgrading in this dissertation (Sen, 1999, 8).

Moreover, development is not solely the result of these freedoms, it is also "among its principal means" (Sen, 1999, 10). To make this so, the people are viewed as active participants in the process of "shaping their own destiny" and taking ownership of new opportunities (Sen, 1999, 53). It is in this niche that mobile phones can be used as a tool for increasing access to resources which foster opportunities for social, economic, and educational freedoms, among others. With a mobile phone, rural Ugandan farmers are able to access information they want, when and if they want it, simply by calling their local agriculture extension project or programme. This tool, if used in such a way, contributes to human development as the first step towards expanding capabilities for freedom. This hits the core of mobile phones' role in these projects wherein the mobile phone user activates

the action to the extent that they choose. This approach, alongside the complementary social exclusion theory, establishes the overarching conceptual framework to drive the study.

3.2.2 Social Exclusion Theory

Social exclusion theory is also included as a backbone of the study with the reasoning that mobile phones have "agentive capacities to circumvent social constraints" (Shrum, Mbatia, Palackal, Dzorgbo, Ynalvez, & Duque, 2011, 615). This indicates that mobile phone technology contributes to human agency so that resource empowerment can override existing social structures and provide freedom through access capability. Social exclusion theory works alongside Sen's Capabilities Approach to craft a more complete theoretical foundation for this research.

It is believed that social exclusion was first coined by Adam Smith in 1776 with his straightforward words that exclusion is the "inability to appear in public without shame" (Smith as quoted in Sen, 2000, 4). This highlights the strong relational aspect of social exclusion, especially the ability "interact freely with others" (Sen, 2000, 5). Without this ability, the individual faces poverty through a lack of access to resources and ultimately a deprivation of capabilities, corresponding to views of the Capabilities Approach (Sen, 2000).

These elements are also related to the emergence of the mobile as it has changed the face of social interactions even in the most remote corners of Uganda. In the present day, mobile phones are among the most prominent forms of information dissemination and social exchanges; without having access to one, the individual faces the risk of missing opportunities to experience freedom in a number of social and economic arenas. This goes beyond the "digital divide" debate and into something more intimately social with local communities in rural areas. In the words of Mark Warschauer, ICTs with already marginalised groups are necessary to "further a process of social inclusion" (Mark Warschauer, as quoted in Babisky & Salmons, 2006, 63). Furthermore, Jeffry Sachs believes that mobile phones have the ability to end the isolation of poverty and bring about access

to previously unreachable markets (Voigt, 2011). This research combines the perspectives of social exclusion and the Capabilities Approach to explore if and how mobile phones in agriculture extension projects may lead to social and economic upgrading, thus decreasing social exclusion while simultaneously fostering opportunities for freedom.

3.2.3 Conceptual Framework in Case Studies

These two views are not only significant to the findings and analysis, but within the specific case studies as well. Throughout the research, it became evident that each project was fulfilling certain degrees of both Sen's view and social exclusion theory. A significant part of the WOUGNET's core mission statement is to promote and support ICT use so that participants may "take advantage of the opportunities presented by ICTs in order to effectively address national and local problems of sustainable development" (About Us, 2009). This inherently considers the individual as an "active participant of change," a previously mentioned element in the Capability Approach which encourages social inclusivity and participation (Sen, 1999, 281).

The importance of gender is not lost in either project's objectives. Nor, as literature proves, is it a forgotten within the scope of this conceptual framework. Not only is it one of the key foci of social exclusion theory, but Sen also stresses the empowerment of women as one of "central issues in the process of development" (Sen, 1999, 202). Reflecting this, several WOUGNET reports claim that severe socio-economic opportunities are missed if gender is not taken into consideration as well (WOUGNET, Gender, ICTs, and Rural Livlihoods, 2010). This is particularly vital in reference to the rural populations where most of the women, rather than men, are engaged in some sort of agriculture for their livelihood (Okello, 2009; WOUGNET, 2010). This theme parallels the feature of the Capability Approach that emphasises opportunities for women that work to change the "attitudes of the family and of the society at large to women's economic activities, and the economic and social circumstances that encourage or resist change in these attitudes" (Sen, 1999, 202). The Community Knowledge Workers project further emphasises this point through their aim to involve more female farmers as CKWs in the upcoming quarter (Dashboard: Jan-March 2012, 2012).

Regarding marginalised communities highlighted through social exclusion theory, the EAAI project spends a considerable amount of time and resources in ICT training for women and youth so that they may be able to access information through appropriate technologies whenever necessary. Likewise the CKW project created their agriculture database systems with female farmers in mind to ensure adequate information is available for them as well. In addition to their database system, AppLab has an established a network to reach the "last kilometre," or the communities which are most often on the social and economic periphery and are therefore the most difficult to reach (Mission, Vision, and Approach, 2012). Through these shared emphases on opportunities for freedom, individual agency, inclusion, and gender empowerment, the Capability Approach and social exclusion theory are assuredly a component helping to define the processes of the two case studies.

Social exclusion theory and the Capabilities Approach together demonstrate the interdependency of inclusivity, opportunity, and human development. To be social excluded is to be barred access to certain opportunities that otherwise may lead to freedoms. To have the freedom to choose or avoid opportunities whether educational, political, economic, or social, influences human development. This is a continuing cycle that is passed down through generations of marginalised communities who struggle for lives free from a deprivation of access. In his 2000 report, Sen claims that it would be a "mistake to concentrate exclusively only on one or other of the means to such freedom" (3). In light of this, the two theories work alongside one another to create the overall conceptual framework for this research, influencing all aspects of the research from the methodological design to the final discussion.

The subsequent case studies focus on two established agriculture extension projects in Uganda which rely on mobile phones for their daily operations. Both are currently striving towards making the connections between social and economic upgrading as a result of access and usage of mobile telecommunications. The following section provides a brief organisational background of each, a summary of the project and its major components, and then leads into the combined methodology employed during the field research. The

two case study findings are discussed individually and then unified for the final analysis and discussion of cross-themes and policy implications.

Chapter Four: Background of Case Studies

4.1 The Enhancing Access to Agricultural Information Project

The first case study focuses on the Enhancing Access to Agricultural Information (EEAI) project, one of several agriculture extension programmes piloted through the Women of Uganda Network (WOUGNET) organisation. This extension project is distinct because of its twofold focus on both ICTs and rural women farmers in Uganda. This section presents a background of the organisation and the project in particular as it relates to the fieldwork and research as a whole.

WOUGNET was founded in May 2000 as a result of a growing need to house the numerous women's organisations under one overarching network and has since expanded to manage more than 100 partner organisations throughout Uganda (About Us, 2009; Okello, 2010). This initiative created a unique space for women and women-focused organisations to pool resources, knowledge, and skills in order to establish highly effective programmes to address specific issues. Their goal, "to improve conditions of life for women by enhancing their capacities and opportunities for exchange, collaboration and information sharing" is brought to fruition through three primary project categories (About Us, 2009). These categories include Information Sharing and Networking, Technical Support, and Gender and ICT Policy Advocacy (About Us, 2009). Through the use of ICTs in the three programme categories, WOUGNET works alongside the Ugandan National Vision to create a "knowledge-based Uganda where national development and good governance are sustainably enhanced and accelerated by timely and secure access to information and efficient application of ICT"(Parliament of Uganda, 2009).

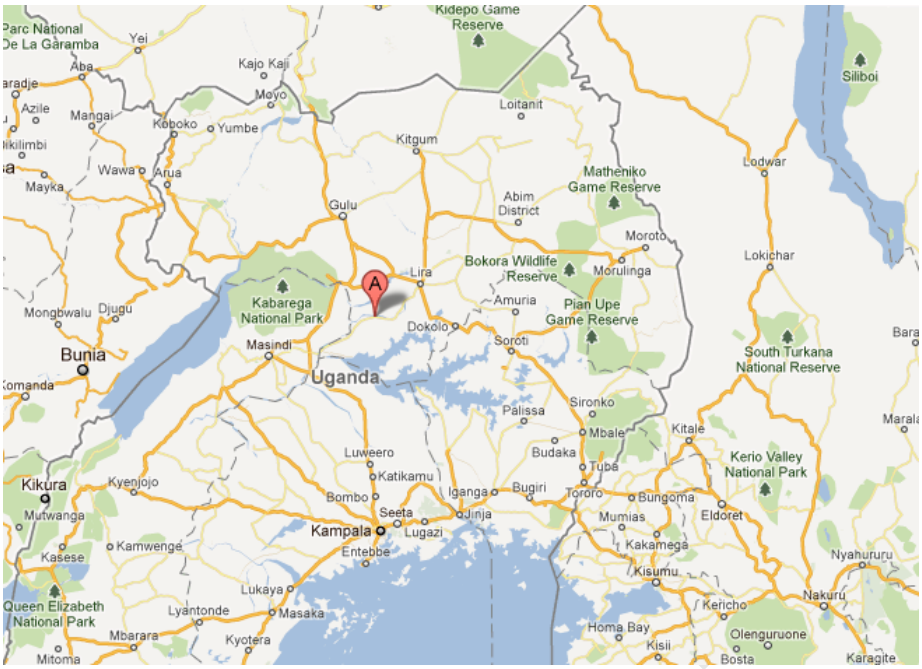
WOUGNET endeavours to combine traditional forms of ICT like radio with more modern technologies to increase their potential range of impact. While this organisation places a strong emphasis on the internet as a means of information dissemination, they also incorporate mobile phones, print media, radio, and television as applicable (About Us, 2009). This is especially beneficial in rural locations where internet accessibility is scarce and when it is available, low literacy rates, up to 69% by 2008 measurements, require

creative solutions to translate initiatives into context-specific actions (Ministry of Gender, Labour and Social Development, 2008).

One of these creative solutions stems from the aforementioned Information Sharing and Networking sector of WOUGNET. Entitled "Access4Dev" projects, they are specifically designed to provide ease of access to information for women in Uganda, especially for those in rural areas. By highlighting the "strategic use of ICTs for sustainable development," these projects address ways to use ICTs for ongoing development and improvement of women's livelihood, both economically and socially (Access4Dev Projects, 2009).

This research focuses on one of their projects called "Enhancing Access to Agricultural Information using Information and Communication Technologies in Apac District," more commonly known as the EAAI project (Access4Dev Projects, 2009). This project began in 2005 with the intent to make relevant agricultural information available to women farmers in the Apac district of Northern Uganda (About KIC, 2009). Currently, this project operates in twelve parishes in the region including Atik, Abedi, Apac, Kungu, Awila, Apoi, Aumi, Agege, Angic, Adyeda, Bar Akalo and Adyang (Access4Dev Projects, 2009). By incorporating mobile phones, radio, and internet technologies within new and pre-existing women's farming groups, the EAAI project attempts to streamline relevant agricultural information from an often complex web of information and resources.

Data from the 2002 Apac District Local Council claim that more than 90% of the district's population relies on agriculture for their livelihood, yet over half of this population is under the poverty level (Gender, ICTs, and Rural Livelihoods, 2010 8; WOUGNET, 2008). The following map presents Apac town within the Ugandan landscape:



(Google Maps, accessed 21 November 2011)

During a key informant interview, Rural Project Manager Brenda Otika explains that the EAAI project's purpose is to provide knowledge to the women farmers. She notes the importance of this by the following:

> Knowledge is power, when the farmers are well informed, they are in a better position to make informed choices on how to cultivate and what to grow in their land, when to harvest, how to store, when and where to market, what prices to charge- thus helping them to obtain high profit margins and avoid being cheated by middle men.

(Key Informant Interview Report, 2011)

In order to make this knowledge most beneficial to the farmers, the project incorporates best practices and lessons learned, capacity building, and informative trainings based on identified agricultural needs, among others (About KIC, 2009). The heartbeat of this project is the Kubere Information Centre (KIC) located in the centre of Apac town. In the local language of Luo, *kubere* means "coming together," to represent the purpose of the physical structure to bring together various sources with pertinent information and make it easily

accessible to the surrounding communities (Otika, 2011). This "multidimensional-information centre" exists for local women farmers to find answers to their agricultural enquiries (About KIC, 2009). Although it is also open to the public as a resource library, the majority of the information dissemination occurs through their weekly radio programme.

The daily operation of the project is illustrated by the following flow chart:

This chart displays each major component of the EAAI project, excluding annual events or special trainings. At the time the fieldwork was conducted, the researcher discovered that the project had not been funded since the previous year and was nearly at a standstill in

operations. The KIC employees still visited the women's groups regularly, but the radio programmes were halted and the resources out-of-date at the time of the researcher's visit.

This element heavily affected the mobile phone study as well. Originally, a mobile phone was given to each women's group by the EAAI project for the purpose of asking questions after radio programmes about specific agricultural topics. Since that time, however, the mobile has taken on additional roles within the group. As the researcher learned while in Uganda, the women now use the phone to call the KIC anytime an agricultural question arises as well as for their daily communication needs, regardless of its connection to the radio programme. According to the women, many of whom owned personal mobile phones, this contributed to greater mobilisation among the group which they considered highly beneficial.

In light of these aspects, this case study explores not only the influence of mobile phone use in the EAAI project but also evaluates the mobile's perceived impact in the social and economic realms overall.

4.2 The Community Knowledge Workers Project

The second case study is based on the Community Knowledge Workers (CKW) project, a pilot of the Grameen Foundation's AppLab Uganda, hereafter referred to as AppLab. While the CKW project has a similar aim to that of the EEAI project, its operation and technology are distinct. This section provides a background by examining the project's roots, development, and current processes.

Although AppLab was officially launched in June 2009, founding partners MTN, Google, and the Grameen Foundation had been building a strong foundation behind the scenes since 2007 (Uganda Project: AppLab Uganda, 2011). During this time, the team conducted "ethnographic research, needs assessment research, rapid prototyping and a connected notebook trial" in order to best determine the needs of the end-user and serve as the outline for their mobile-based application development (Uganda Project: AppLab Uganda, 2011). The result has been an assortment of pilot projects in the health and agricultural sectors. The justification for their work is reflected by program director Eric Cantor in his

belief that “people already have phones in their pocket, already need information, and some organisations already provide that information” (Arnquist, 2009). He concludes, then, that AppLab is simply “accelerating those connections” (Arnquist, 2009). A significant example of making these connections possible is seen through the Community Knowledge Workers (CKW) project as they connect Ugandan farmers with expert farming advice.

The technology behind the CKW project is fairly straightforward. The mobile application captures a variety of agricultural data including GPS, photo, video, and audio, and compiles it into a user-friendly database for the Community Knowledge Workers (CKWs) to access from their smart phones, which are provided by AppLab. The project works through the MTN network in Uganda to ensure adequate coverage for farmers if they choose to phone the CKW and for CKWs when the database needs to be updated. Otherwise, the database information is available offline and can be accessed from any area, regardless of its distance from a network antennae or tower (Uganda Project: AppLab Uganda, 2011).

The project’s operations, much like the technology itself, are designed to be as efficient and as widely effective as possible. CKWs are chosen at the community level by AppLab staff with assistance from local farm groups and cooperatives (Namubiru, 2011). By working through pre-existing organisations and farmer networks, AppLab gains access to the farmers who are already involved and committed to work in the local community. Additionally, Namubiru mentioned, CKWs who are chosen by this method typically face increased accountability to fulfil their responsibilities to the other farmers (Namubiru, 2011).

The selection process emphasises trustworthiness, a willingness to serve, and long-term commitment to their communities. As the CKW serves as an intermediary between farmer and database, the position requires them to be literate but not necessarily agricultural experts. The literacy issue has had an adverse effect on employing females in the CKW role as their literacy rate is lower than that of men in Uganda (Hahn, 2010). In light of this fact, approximately 30% of current CKWs are female which falls below the original goal of 40% from the second quarter (Hahn, 2010). To overcome this issue, AppLab is working to

develop call centres and voice commands so that more women may qualify to become CKWs in the future (Hahn, 2010). In the meantime, and perhaps to balance the current discrepancy, AppLab has consciously weighted the available agricultural information towards topics that would be beneficial to rural Ugandan women's most common responsibilities, such as preparing gardens and plant management (Hahn, 2010).

Once CKWs are chosen, they undergo rigorous training to learn about the features and applications loaded on the smart phones. Since the phones are on loan from AppLab until CKWs can fully purchase them, CKWs are required to pay a certain amount from each pay check toward the phone's cost (Namubiru, 2011). Although this means that their pay is marginally deducted, they are provided with several solar chargers and encouraged to start a small enterprise in their community to generate additional income (Namubiru, 2011).

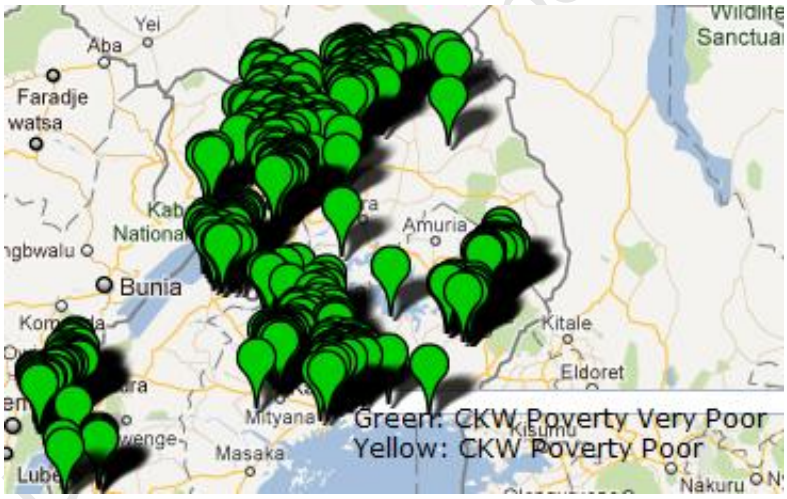
A CKW has three primary tasks: register new farmers for the service, conduct phone-based surveys from AppLab and their partners, and answer local farmers' questions. For this they are expected to maintain a certain level of numbers each month, both with new registered farmers and completed surveys. Each CKW is responsible for approximately 500-800 households in the surrounding area so they often have to travel outside of their home villages in order to reach this number. Farmers with pressing questions can also come directly to the CKW or use a mobile phone to contact him or her.

Upon registration, the CKW fills out a brief form on their smart phone with the following components:

Name:
Father's Name:
Gender:
Household Status:
Village:
Extension Questions (how many hectares, top 3 crops, etc.):

This simple registration process provides the farmer with a unique ID number to use for future queries. This ID number also stores past questions and tracks frequency of use. Currently, this data and other task reports are captured through AppLab's virtual "dashboard." This platform is able to monitor the end user, the farmers, and the CKW. With the farmers, it tracks how often they ask questions as well as the distribution of use. "Distribution of use" includes gender, demographics, and geographic location of the farmers (Namubiru, 2011). Additionally, the web-based dashboard keeps a record of the number of surveys completed by each CKW to measure their progress alongside the monthly requirements.

The CKW project has expanded to nearly every corner of Uganda, as demonstrated by the density map below:



(Dashboard: Jan-March 2012, Accessed 10 January 2012)

Throughout the next two-and-a-half years, AppLab plans to undergo a full impact assessment on this pilot project in order to best gauge the current strengths and weaknesses (Namubiru, 2011). These research findings, to be discussed in Chapter Five, provide a step in the right direction. The following section discusses the practical methodology in light of these unique case studies, including ethical considerations and any limiting factors.

Chapter Five: Combined Research Methodology

In order to explore these case studies thoroughly and gather the most relevant information possible, the researcher engaged a variety of data gathering tactics. The research method is qualitative and includes textual analysis, observation, and interviews with key informants and participants from several organisations. This method seeks to establish connections between the text, previous research projects, and the case studies. This method was chosen to allow for the most holistic view into mobile phone's effect on the potential social and economic changes in livelihood for rural Ugandan farmers.

This chapter is organised around the methodology employed during the fieldwork in November 2011. In those four weeks, the researcher conducted semi-structured interviews with several key stakeholders and project participants, reviewed the organisations' documentation and reports, and engaged in non-participatory observation in the daily operations of the two case studies. The discussed methods encompass both case studies as they share many of the same approaches. Any differences are noted as applicable.

First and foremost, as a foundation for the study and later as an enhancing supplement, a number of academic and non-academic documents and reports were utilised. These include, but are not limited to: scholarly articles and previous case studies in this and relating fields, relevant published Masters and PhD theses, and recent publications from government and leading mobile phone companies. Ethnographic field work was also conducted. Regarding articles and relevant statistics, search engines such as EBSCOhost, Academic Search Premier, and Science Direct were used. Keywords for searching these databases included: "cell/mobile," "phone," "resource," "ICT," "development," "information," and "access," among others.

Regarding the semi-structured interviews, similar outlines were used for project participants in both case studies. Although the two have different organisational aims and methods, both projects are concerned with mobile phone usage as it affects agricultural extension. Therefore, the interview outlines were based on Aker's parameters for

evaluating the impact of existing ICT-based approaches to agricultural extension (Aker, 2011, 11-12). An abridged version of Aker's guideline questions is included here:

1. What is the impact of ICT-based agricultural programmes on farmers' knowledge, agricultural adoption and welfare? (Are the outcome changes due to ICT interventions or could it be other factors?)
2. Are these outcome changes (hopefully improvements) due to the ICT project or due to the increased access to mobile phones?
3. How does the cell phone service change farmers' access to information and learning?
4. How does this service affect different groups?
5. What are the potential spillovers of the ICT-based programme to non-participants as well?
6. Is it cost-effective for the farmers?
7. Are results comparable to external findings?

(Questions adapted from Aker, 2011, 11-12)

These served as a foundation for the interview guideline used during the fieldwork. The interview questions also included topics surrounding project participation, access and perceived role of mobile phones in their farming business and personal life, and additional influences for any change in livelihood. Moreover, the researcher maintained focused interviews by reflecting back to these four questions:

- How do farmers, especially female farmers, perceive the role of mobiles in their social and economic lives?
- How has the mobile phone contributed to farmers' social upgrading through economic means?
- What external factors exist that may affect the social and economic livelihood of these farmers?
- Do they use the mobile phone repeatedly or plan to use it again in the future (to gather information from the agriculture extension project)?

These questions are adapted from the sub-questions presented in Chapter One and create a strong bridge to the overarching research question which addresses mobile phones and their influence in social and economic opportunities for rural Ugandan farmers.

5.1 Fieldwork

The fieldwork was composed of four stages corresponding to the four weeks spent in Uganda. The first and third stages took place in Kampala and served as a time of foundational information building in the beginning and follow-up interviews with key project stakeholders in the final stage. To accommodate the time availability of the interviewees, however, interviews were carried out intermittently throughout the entire month.

5.1.1 First Stage

The interviews during the first stage centred on a key member from each case study including Janet C. Achora, Senior Programme Officer at WOUGNET, and Lydia Namubiru, the Monitor and Evaluation head for AppLab. During this time, the researcher also gathered several reports and documentation from these organisations that were applicable to the EAAI and CKW projects, respectively.

The first half of this week was focused on WOUGNET and reviewing the reports and DVDs they had provided. The researcher spent numerous hours in the office perusing the documents and gathering supplementary information as necessary. The researcher also made contact with the Grameen AppLab, but aside from an introduction to the project by means of an informal interview, the CKW research and fieldwork details remained undetermined during this stage.

5.1.2 Second Stage

In the second week, the researcher planned to travel to Apac district in Northern Uganda for data collection but was delayed in Lira by an unexpected kidney infection. Due to this

setback, the researcher was unable to spend the full week originally allotted to this task and only arrived at the Kubere Information Centre (KIC) several days later.

Finally arriving in Apac, the researcher seized the opportunity to conduct further observation, interviews, and gather more recent documentation. The researcher spent the first two days in Apac observing the operations of the KIC, the physical hub of information and training for the EAAI project. With assistance from the Information Officer, Lillian Mercy Ogema (shortened to Mercy Ogema), Brenda Otika, the Rural Projects Manager for Northern Uganda, and Walter, the new volunteer, the researcher obtained relevant reports and materials to examine during this time.

The remainder of the week focused on interviews with women farmers in individual or group settings. Mercy Ogema and Brenda Otika were present for all of the interviews, which was beneficial for several reasons. Not only did they provide interpretation services and context-specific advice to ease the cultural differences in the rural areas, but Mercy Ogema has also worked with these women farmers and farming groups for several years and had established trust and a friendship with them which reflected positively during the group interviews. Lastly, Brenda Otika is a relatively new member of staff and had yet to meet some of the farmers so it was an opportunity to share the introductions and provide further legitimacy to the purpose of the visit.

The final total of participants in the individual and group interviews totalled 49, with only 5 of them being male[1]. The interviews were conducted in either English or Luo depending on the lingual preferences of the interviewee. All interviews were recorded, with the interviewee's verbal permission, and later used as a supplement to substantiate the interview notes[2]. Given that each interview took place alongside an otherwise routine women's group meeting, other EAAI project workers were present and helped in documenting the interview responses as well, which provided a more balanced and accurate record of the responses.

[1] See EAAI Interview Schedule in Appendix 1
[2] See EAAI Interview Results in Appendix 2

Thanks to the cooperation of Brenda Otika and other WOUGNET staff, the researcher was provided ample opportunities to learn, question, and observe the daily operations of the project. While external circumstances prevented an extended stay, sufficient data were collected during the time in this area and any follow-up questions presented by the researcher have been since answered by WOUGNET staff.

5.1.3 Third Stage

During the third stage, the research focus shifted to the second case study, the Community Knowledge Workers (CKW) project. The researcher pursued follow-up meetings and spent several days in the Grameen AppLab headquarters in Kampala. During this time, the researcher was introduced to AppLab's online data capturing platform "dashboard." Furthermore, Lydia Namubiru and the researcher organised plans for a fieldwork opportunity in Kasese District to be conducted during stage four.

Simultaneous to the CKW focus, the researcher met with key informants at the International Food Policy Research Institute (IFPRI), Todd Benson and Nicholas Minot, and AppLab's Mobile Money team leader, Olga Morawczynski. During these meetings, the researcher gained valuable insights into the past and current state of affairs in Uganda regarding mobile phones for developmental usage in the government, private, and not-for-profit sectors. Findings from these interviews are included in Chapter Seven as applicable.

5.1.4 Fourth Stage

The final stage closely mirrors the second week in terms of similar qualitative research methods and general interview guidelines. During the fourth week, the researcher spent time in Kisinga sub-county in Kasese District with the CKW project. While there, the researcher had the opportunity to interview farmers and observe the interactions of CKWs with the local community members. Unlike the group interviews common to the EAAI project, these were formal, individual interviews with the farmer at his farm or in the nearby trading centre. The Kasese District field officer, Bakuku James, accompanied the researcher to the various interview locations. For all of the interviews, the CKW assigned to

that region was also present. The schedule, totalling 15 formal interviews in all, can be found in Appendix 3. The interviews were conducted in English, Lukonjo, or a combination of both. With the interviewee's verbal permission, all interviews were recorded and later transcribed[3]. Further details and information regarding these and the EAAI interviews are located in Appendices 2 and 4. The subsequent findings and discussion chapters are the result of these interviews, reports, and observations gathered throughout the four stages of fieldwork.

5.2 Ethical Considerations

No research project is valid without ethical considerations. There are inevitable circumstances and positions that must be addressed within the scope of any project, but specifically when it directly involves community members through fieldwork and specific community and non-governmental organisations. When in the field, the researcher asked consent from every interviewee and group participant not only to record, but also to quote their responses as applicable. Additionally, the researcher adhered to the code of ethics presented by the American Sociological Association and the International Sociological Association. Among others, social responsibility and integrity served as the forerunners for this research project (ASA Code of Ethics).

The following section will examine the findings from both case studies, beginning with WOUGNET. Afterwards, the two will rejoin to enhance the final component of this project, the final discussion and future implications.

[3] See CKW Interview Results in Appendix 4

Chapter Six: Research Findings

The compilation of findings is a result of the reports, interviews, and observations that took place during the fieldwork component in Uganda during November, 2011. These data were gathered with the assistance of WOUGNET and AppLab Uganda. Throughout this chapter, clarification or further reading about the interviews can be found in in the attached appendices, which include the EAAI and CKW interview schedules as well as the interview notes and transcriptions.

The upcoming findings were generated through shared themes that arose throughout the data collection process. By assigning common responses with coding labels, the researcher was able to uncover the majority view from the combination of interview notes, transcriptions, and relevant documentation. In addition to the most frequently-stated answers, those which held a very strong opinion were also taken into account by their specific reasoning and explanation for their response. Together with the researcher's overarching impression and personal field notes, the most common themes and the issues therein formed the basis for each of the case study findings. While many of these findings overlap and are often mutually dependent, they have been separated into 13 primary categories, 6 for the EAAI case study and 7 for the CKW case study.

6.1 EAAI Case Study

1. *The reality of "access" has more challenges to achieve than personal ownership or the ability to obtain a mobile phone through sharing or borrowing.*

The ability to access a mobile phone handset was not reported as the most pressing need. In fact, nearly all of women claimed they could access a handset even if they did not personally own one. Most of the women said that their options for borrowing included family members, neighbours, or other members of the women's group and they did not seem worried about accessing it when necessary. Moreover, every single interview participant is supposed to have the opportunity to use a mobile phone if need be because each group is provided one through the EAAI project for the purpose of increased accessibility.

However, the group interviews revealed a string of obstacles associated with mobile phone access beyond the actual handset. In the case of these women, the barrier to access was a result of the functionality and associated costs of the phone. Two of the women's groups were very expressive in their feelings about this element of access. With a simple question, the researcher learned that half of the women in the Oumi Parish group had access to a mobile through the familial network and all of the Barwelo Village group members could access a phone. However, these women were quick to volunteer reasons why they quickly said "no" in response to the question regarding access.[4] The most common responses included bad network signal, airtime deductions from underuse, and no power for charging. Referring to the accessibility of charging, one participant simply states: "it's bad out here" (Scan Pe Kun Group, 2011). One of the groups was promised solar chargers by a development NGO, but they reported no follow-up on the opportunity since then.

This topic is not foreign to the staff members of the EAAI project either. In a key informant interview, Otika places this issue among their greatest challenges. She claims that "communities do not want to cost share" because even though each group is provided with a radio and mobile phone to use among group members, they "still need KIC/WOUGNET to procure for them the dry cells to put in the radio and the airtime for their mobile phones" (Key Informant Interview Report, 2011). Therefore it may be determined that the challenge of gaining access to a mobile phone, as demonstrated by this sample group of women farmers, extends far beyond just sharing or borrowing a handset.

2. *If women farmers have access and opportunity, especially to group membership, they will utilise mobile phones to meet relevant information needs regarding their livelihood and to obtain developmental resources.*

All of the women, whether individually or as a group, had called into the Radio Apac agriculture programme at least once to pose a question. It was unclear whether the calls always followed the programme's theme or if it was just as issues arose, but the women

[4] See EAAI Interview Results in Appendix 2.

were eager to relay their experiences nonetheless. In some cases, the reason for calling benefitted the entire group. For example, Beatrice recounted the time when she called KIC following a Radio Apac interview with a veterinarian. She said her chickens suffered from a "rampant disease" and was advised to vaccinate them every three months (Beatrice, 2011). She now pools her resources with others in the farming group to collectively purchase the vaccination quarterly to keep the disease from returning. While this is a case of a farmer who utilised mobile phone technology to improve her agricultural practices, it is also reflective of a broader finding about the impact of group membership alongside mobile phone usage.

In addition to agricultural information, women reported using the mobile phone for general communicative purposes. In fact, "communication" itself was the most popular response during the discussion of mobile phone's best feature for the needs they identified. This element of communication continues to reappear throughout the research. Through the availability of mobile phones, when they are in a charged and credited state, the women farmers reported this device as a significant tool to gather agriculture information and advice.

Apac District, Uganda- Women farmers listen intently to WOUGNET staff during a farm group meeting (photo taken by researcher, November 2011).

3. *Information received through mobile phones is shared with relevant community members, but that does not guarantee successful agricultural extension.*

The experience of spending time with several women's farming groups revealed a strong sense of sharing and networking among them. The women exemplified having group ties, yes, but also appeared to share a mutual understanding for the rigorous tasks and challenges they face both in the field and out. Understanding this, the women participants were willing and eager distribute beneficial information they received from the EAAI project.

When prompted, the groups easily produced numbers of the people with whom they have shared their agricultural information gathered through mobile phone means. Every women's group immediately reported telling the rest of the members, which accounts for anywhere from 9 to 30 other farmers. Others mentioned family members, including in-laws, and neighbours. The most common places to share this information, they reported, was either in farming meetings or while working in the field alongside other farmers.

One woman pointed out that even though she has told her neighbours, she was uncertain if they heeded the advice. According to her, the mixed reactions with which some people receive tips give her doubt that they may actually adopt them (Scan Pe Kun Group, 2011). This is a vital element to note. When information is shared from project participants to non-project participants, it reflects positively on the organisation and their impact spreads. Ideally, this spread of information would produce a greater number of project beneficiaries. However, "impact" is an allusive concept to measure when the information is disseminated on such a broad level. So while sharing the received information is generally considered a positive sign for the project's effectiveness as a whole, its influence on economic or social upgrading cannot be easily measured among the rural women farmers in Uganda as not all farmers will adopt the new techniques.

4. *Even when "access to information" is achieved through the mobile phone, it is not a mutually exclusive contributor towards social upgrading.*

Similar to the additional considerations associated with mobile phone access, external factors must also be considered when attempting to measure any change in livelihood. The

research produced evidence that showed certain limitations may exist for an agriculture extension programme that focuses solely on information dissemination. In the extremely rural and less rural areas alike, groups expressed gratitude for receiving information alongside the woes of inaccessible markets in the same breath. The structure of the discussion was intended to curve from topics of agriculture and mobile phone usage into any social and economic changes the farmers have witnessed in their personal livelihoods. Yet beyond this seemingly simple equation, there were greater problems to overcome that even the most experienced extension workers could not cure.

Comments about a lack of market were sprinkled throughout the responses, not adhering to any one question in particular. Whether they viewed it as a local infrastructure problem, inclement weather, or on the shoulders of a grander macroeconomic issue, external obstacles inhibited many of the women from experiencing economic, and therefore social, upgrading even after the introduction to more agricultural information through their mobile phones. In all three of the women's group meetings, the need for markets was heavily emphasised. One participant illustrated the need by saying that "knowledge is never enough for one" and then asking if KIC could connect them to markets for their products (Orib Can Barwelo, 2011). This was met with agreement and support from her fellow farmers. Women in the Orib Cing Oumi group explained that the terrible road conditions made it nearly impossible to access a market beyond their local trading centre. Having travelled to this rural village for the meeting, the researcher can confirm the near impassability of the roads for those attempting to leave or enter the Bala sub-county, especially if not equipped with a four-wheel drive vehicle.

Another external factor is the climate. Many women talked about the discrepancy between the amount of labour and capital that goes into the crops and the yield that results (Orib Cing Oumi, 2011). This comment was given notwithstanding the agricultural information provided through the EAAI project; it instead referred to natural causes like infertile soil, rain, drought, and other seasonal changes. While no current technology can change the weather, advanced warning systems and weather updates through the mobile phone as

part of the project may improve the farmers' situation by increasing access to additional elements that affect their agricultural businesses.

A final factor in the interviews that operates beyond agricultural advice dealt with the commonplace facets of life that require upkeep. This includes activities like education (school fees, uniforms, and boarding, as applicable), home maintenance (adding-on, repairs), and medical emergencies (doctor visits, transport to/from medical facilities, medicines, ARVs). Throughout the interviews, the women farmers acknowledged advice they had received through the EAAI project but could not use due to these extenuating circumstances. One farmer said that she had been advised to delay selling her crops, as the market price was predicted to increase (Scan Pe Kun Group, 2011). However, she needed to sell at any available price to have money for school fees, which was an immediate need (Scan Pe Kun Group, 2011). A member of the Orib Can women's group in Barwelo continued on this issue when she asserted that access to agricultural information is no longer the issue but accessing other resources, like markets to sell products, are the issues now. Thus it appears that access to agriculture information alone is not sufficient to produce an overall improvement in farmers' social and economic livelihoods.

5. *The patriarchal culture is infrequently addressed yet remains an undercurrent of overall mobile phone usability and access.*

The researcher takes certain liberties in this finding given that much of the evidence is based on farmers' afterthought comments, observation, and lengthy discussions with male extension workers about their perceived role of women. Men were present, either in the audience or as members of staff, in every interview except the first, during which Beatrice stated that some women are not allowed to own mobile phones because it would "break balance in the house," according to their husbands (Beatrice, 2011). Moreover, she said that some women have difficulty in simply accessing a mobile phone, regardless of ownership because "men in the house don't allow it" (Beatrice, 2011).

This was also heavily addressed in scoping studies before the project officially began in 2005. Researchers determined that men must be a part of the planning and implementation process in order to expand the opportunities for women's involvement as a consequence. While there has been little follow-up on the subject by WOUGNET to date, past reports suggest that they continue to strongly emphasise the importance of male participation in every step of the ICT engagement process (Kayabwe & Kibombo, 2003).

This issue was briefly revisited during the Orib Can Barwelo women's group meeting as well. Given the small size of this group, only nine participants in total, it was easier to engage and interact with the various topics. Interestingly, it is the only women's group meeting with all female participants (and would have been exclusively female, except the EAAI volunteer Walter was also in attendance). It was unclear who voiced the comment that a "husband or son might not allow it," referencing access to a phone even if the handset is considered a "shared good" within the family (Orib Can Barwelo Group, 2011). When probed, they also mentioned that mobiles can lead to domestic violence when calls are made "during awkward hours" (Orib Can Barwelo Group, 2011).

Yet during another meeting, Walter initiated the topic of domestic violence caused by mobile phone-related disputes and the participants quickly stated that it does not happen within their group. Here is a difficult case of environmental factors and participants' comfort level to confide with the others and with the researcher. It is inconclusive, based on these mixed responses, if men's dominance in the familial unit has negative effects on mobile phone access for the women, or whether it is something that "could" happen, but rarely does. The topic is worth pursuing in greater depth for future studies with access and the impact of information dissemination programmes focused on rural Ugandan women.

6. *Social and economic upgrading may be attributed to the benefits associated with group membership in addition to mobile telecommunications.*

As the interviews progressed, it became clear that group membership, and the social network formed therein, was a support to the women farmers both economically and

socially, providing them with a space to learn and collaborate together. The groups gather at least once a week to discuss current farming issues and listen to the latest KIC-produced radio programme. It is a very viable setting for information dissemination to take place. Additionally, this is the context in which they share the information they may have gathered elsewhere, creating an environment for knowledge growth. When asked the most important thing about a mobile phone, every group incorporated "mobilisation" into their responses to varying degrees. For many, mobilisation is most useful to call emergency meetings or inform fellow farmers on training opportunities.

Furthermore, examples of the group's joint successes were evident in many of the responses and occasionally visually evident in the surroundings as well. During the meeting in the Oumi parish, for example, the women proudly indicated towards the numerous chairs on which everyone was sitting, explaining that they had purchased them as a result of improved income from group farming (Orib Cing Oumi Group, 2011). Group loan sharing and group saving accounts were also commonly mentioned among the new farming practices adopted through KIC-provided information (Henrietta, 2011).

This element was highlighted in conjunction with the EAAI project, as two of the three groups reported that they learned the importance of "togetherness" from one of the radio programmes (Orib Cing Oumi Group, 2011). This concept includes anything from sharing pesticides and vaccinations, like the chicken vaccination noted by Beatrice, to group purchasing a shared field crop they managed, such as sunflowers with the Scan Pe Kun group (Beatrice, 2011; Scan Pe Kun Group, 2011). A unique example was provided by Helen, chairperson of the Orib Can Barwelo group, as she related a time when there was an issue within the group and she called the KIC for advice about group dynamics. When she put the advice into practice, it worked (Orib Can Barwelo Group, 2011).

There are other considerations, however. Firstly, WOUGNET is responsible for forming some, but not all, of the currently existing women's groups in the EAAI project. During their scoping study in 2005, they decided to utilise a blend of pre-formed and already operating groups with those they had formed specifically with the project in mind. With this fact

largely overlooked during the interviews, it is not possible to further speculate about the effectiveness of these groups with or without the involvement of the EAAI project at their conception.

In light of these findings, it may be argued that mobile phones make these group social and economic results more attainable. Most of the participants included group and social networking references in their responses to the questions about "new information from the project" or the "most important thing about having a mobile phone." It is reasonable to assume that, at least on some level, the ability to quickly and efficiently mobilise as well as communicate with other members of the group has been a contributing factor to the positive benefits reported from the group dynamics as part of the broader social network. This contributes to the idea that a synergy exists between groups and mobile phones, a topic that will be further examined in the final discussion.

While diverse, these six findings provide a qualitative look into the workings of mobile phones' role in the EAAI project and within the broader context of women's farming groups in rural Uganda. The findings are further examined in conjunction with the CKW findings in Chapter Seven.

6.2 CKW Case Study

6.2.1 Qualitative Findings

1. *Reports of improved quality and quantity of products are equally emphasised by the farmers.*

Although the mention of higher yields was undeniably present, a surprising number of farmers, unprompted, commented on the improved quality of their products as well. This may be due to the "crop doctor" role of the CKW who is called upon in times of plant disease, near crop failures, and animal illnesses. In a surprising number of the interviews, farmers chose to emphasise better quality for economic improvement over a strict increase in numbers. One such example comes from Salomi Frikan. Her story, as translated by Bakuku James, is as follows:

> She says that she planted her bananas. They started doing well, but later on they got infested with a disease and she almost abandoned everything. They went almost up to zero. But when these people {the CKWs} came she was planning to cut the whole banana down. So when these people came, they said 'No, don't cut down, do this, do this, do this,' so she has again started improving. So she is now able to get 90 thousand shillings, okay 30 thirty thousand shillings in a week.
>
> (Frikan, 2011)

Additionally, Masereka Ezra reported that although he is not producing a higher volume of coffee than before, he now produces 5 kilograms of clean, and therefore sellable, coffee per every 15 kilograms as opposed to the 3 kilograms previously. He attributes this success to "knowing the information" (Ezra, 2011). Examples of quality improvement like these were plentiful throughout the interviews. This emphasis, which highlights the product's market worthiness over numbers of bunches or kilograms, ultimately determines economic improvement for the farmer. For some, this improvement began through better coffee leaf colouring, such as Masereka Scovia, while others commented on increased berry size (Scovia, 2011).

Some interviewees did emphasise larger yields as a result of the CKW-provided information, however. Amon Sivas, for example, pointed out that his coffee yield had doubled from 30 to 60 kilograms within the last season (Sivas, 2011). Others reported even more dramatic results. Over the span of two seasons, at least one of which was heavily saturated by CKW involvement, Masakera Paulin has improved his coffee yield from a mere 40 kilograms to now over 200 (Paulin, 2011). Still more farmers broadly spoke of a "very big improvement with the yielding," but did not provide specific figures (Gabriel, 2011). It should be noted, however, that this number increase was an intentional component of the interview, while the quality improvement comments were initiated by the farmers.

Perhaps the most accurate description of this finding comes from Baluko Violet's words, translated by Bwambale Chris: "She says that before she was given such information…her

yields were low. But since she got information, she has managed to put some terraces. And though it is not too much, but the little she has, she harvests and gets some good quality coffee" (Violet, 2011).

2. *It cannot be assumed that information and knowledge will lead to economic upgrading if sufficient resources, like available inputs, are not accessible to the farmer.*

Knowledge is power, yes, but knowledge alone does not increase crop yield. While the quality of information is vital, it cannot replace tangible inputs needed to solve an agricultural problem or prevent it from recurring. Farmer Bwambale Francis Kyahuliro, according to James, "would have benefited much, he would have improved his farming business, but the problem is that even when they advise him, he lacks inputs" (Kyahuliro, 2011). In this case, "inputs" refers to the resources necessary to do something. For these farmers, the most commonly cited input needs were ploughs, oxen, or raw materials.

With additional probing, James relates the example that "he may be able to treat the birds and they become alright, but because these birds feed from far and he doesn't have, has never, does not have inputs to construct a house for them, then they may be eaten up by wild animals" (Kyahuliro, 2011). Additionally, a lack of inputs was the reason for non-participation of other farmers, according to several interviewees. Information, then, is beneficial only when resources are already in place or are accessible to improve the situation in the long term. In light of this finding, policymakers should consider the external circumstances that may surround a farmer's economic situation rather than creating policies that are too narrowly focused and neglect possible supplementary factors.

3. *Based on the interviews, the majority of farmers prefer to contact the CKW through a mobile phone if the issue is not severe.*

Of the fifteen interviews, one did not respond, six do not contact the CKW via mobile for a variety of reasons (close proximity or lack of phone knowledge being the two most prominent), and eight reported calling the CKW as common practice to obtain answers to their agriculture needs. This means that over half of the participants regularly contact their

CKW through a personal or shared mobile phone. “The magnitude of the problem,” according to Ngundi Johnson, determines whether they call for the CKW to come or whether they simply ask their question over the phone (Johnson, 2011). For others, they have “always called them,” such as Baluka (Susan, 2011). Similar to Ngundi Johnson, Baluka may also call her CKW to check something on her plants if she has a “strange case” (Susan, 2011).

Of those who do not use their phone to contact the CKW, three claimed that their CKWs “come around” often or live close enough so they have never needed to contact them (Mahari, 2011). Another just purchased a mobile phone and has not started using it frequently yet, one is married to the CKW, and one is a neighbour of their CKW. Mbusa Geofrey spoke of being neighbours with Mbusa Eric, saying he simply “calls by mouth and then he hears” if there are any issues (Eric, 2011). The majority of farmers, however, choose to call their CKW using the mobile phone, highlighting that a significant portion of the CKWs’ daily work happens behind their phone. Given that CKWs are the information disseminators, their availability is a significant contributing factor to the farmers’ ability for social upgrading.

Kasese District, Uganda- A CKW displays a healthy vanilla pod given as a gift from a local farmer (photo taken by researcher, December 2011).

4. *Membership in a farming group or cooperative positively influences information gathering and dissemination.*

Fourteen of the fifteen interviewees spoke of their farming or cooperative group as an additional source for information gathering and sharing. The first interviewee was not asked, so his participation in farming group is undetermined. Everyone else, however, was quick to include the farming group as the prominent group from which they derive additional farming information outside of the CKW project.

Sometimes the farming groups are associated with the CKW project, however loosely or informally. According to Muhindo Gabriel, some farmers do not ask questions to the CKW simply because they are not "part of our cooperative," he says, "but when they join they will be interested also {in the CKW project}" (Gabriel, 2011). He goes on to agree that mobile phones help to mobilise for meetings, similar to a common response from the women's farming groups in the EAAI project.

Most often, farm groups come about as a result of agriculture extension workers sent by larger organisations, such as the National Agriculture Advisory Services (NAADS). Other popular farming groups included Uganda National Farmers' Association, Nyanga Cooperative, and Bukinjo Joint. Moreover, some interviewees reported membership in all-women's farming groups, but most, when asked for further details, said they were part of mixed, or co-ed farming groups in the area. Regardless of which group they hold membership, the information shared by and throughout this connection has an inevitable effect on the CKW's influence. If, like Gabriel's example, the group has ties and a history of asking the CKW questions, then it may prove highly beneficial for both parties involved. However, if the farming group is not in the habit of calling upon the CKWs, then an opportunity for partnership may be harder to establish without the acceptance of at least one group member.

5. *The "communication" aspect of mobile phone usage encompasses a wide range of social and economic opportunities for improvement.*

More often than not, "easy" or "quick" communication was the immediate response for the way in which the mobile has affected their lives. Of interest to note is that although the question was open-ended, most respondents opted to discuss the social benefits of mobiles rather than economic effects. This theme is best interpreted through the concept of social networking, which explores the mutually beneficial outcomes of information sharing among social groups (Ethier, 2006).

As expected, access to information was associated with the widespread responses for rapid information retrieval as well, aided by the social networks put in place through the use of mobile phones. As a component of this, the cost-saving benefits of information access through the mobile were highlighted by a number of farmers. This falls under the category of economic improvement, albeit by an indirect route. As Eliza Mugisa says, "instead of moving very far to communication, to make a communication, you just call" (Mugisa, 2011). The phone, then, "can help you get to know what you wouldn't have known otherwise" (Mugisa, 2011).

Another interviewee combined the benefits of a mobile phone with her social and economic life by stating that "it has simplified her life…it simplifies her work" (Rebecca, 2011). Still others reported using the mobile phone for their own business purposes. Several of the farmers mentioned side businesses or selling their crops independently of the common market scene (Rebecca, 2011). For this, they emphasised the importance of having access to a mobile phone in order to talk to clients and potential customers.

This also relates to faraway family or friends, considered as an extended social network. Many of the farmers had spouses, children, or other family members staying elsewhere in Uganda and the ability to keep in touch with them is very important, respondents like Salomi Frikan and Gowdesea Marahi assert (Frikan, 2011; Marahi, 2011). One farmer, Annet Muhindo, even noted the time before mobile phones as a time of "no

communications," indicating the importance of the opportunities now to get to know "what is happening on both sides" (Muhindo, 2011; Ezra, 2011). Overall, the ease with which the mobile provides answers was the most common theme. In the concluding words of Baluko Violet, you "just call and someone answers them {the problems}" (Violet, 2011).

6. *A "change in livelihood" is primarily described as economic upgrading leading to social upgrading.*

At the close of every interview, the farmer was asked about a perceived change in livelihood, life opportunities, or welfare as a result of using or having access to a mobile phone. The precise wording was dependent upon the interviewer and the context of the conversation until that point. Without further prompting, the majority of farmers assumed this to refer to an economic change and proceeded to discuss the affects from an improved income.

For example, Masereka Ezra, without hesitation, stated that the "improved income has helped him solve some of this problems" (Ezra, 2011). For others, it is not so much about solving previous problems as it is about moving up the economic, and therefore social, chain. Items such as paying school fees (and moving children to a better school if possible), having sufficient food to eat, getting money to treat illness, and the ability to purchase various farming and household resources like poultry, pigs, goats, ploughs, or chairs were the most commonly reported. Some, like Amon Sivas, have even begun saving, something that is very difficult to do in a sector of such uncertainties and fluctuations (2011).

One of the more striking examples of this economic lens is seen through the experience of Masakera Paulin, as translated by Bakuku James, "…improved income. He's comfortably paying school fees, doesn't need to look for where to borrow money from, he's feeding very well, he's able to buy enough food, he's planning very well for his family now" (Paulin, 2011). This string of opportunities has inherent links to the social upgrading aspect as well, but is described through the economic side as a result of improved income from agriculture.

7. *The personal commitment and social facilitation roles of the CKWs are vital for the project's success and sustainability.*

Interestingly, the CKWs' personal role in the project strongly affects its perceived success or shortcomings. In this finding, it is necessary to consider that the interviewed farmers are not representative of the whole. On the contrary, they were chosen through their CKW which may indicate a pre-established relationship or greater degree of familiarity. Indeed, the farmers never spoke ill of the CKW in the interviews, but rather commented in other areas that contribute to the importance of the CKW's role on a personal, rather than business, level.

Farmers also reported that non-participants' lack of involvement was due to laziness or lack of caring, but not due to lack of available information or irresponsibility on the part of the CKW. Instead, Baluko Violet's description of uninvolved farmers is that "they don't mind not minding" about this information service available to them (Violet, 2011). The change comes, then, when non-participating farmers see the results from the good advice and begin to adapt and make changes in their own farming techniques based on the information provided through a CKW, or a beneficiary of a CKW. Therefore, based on the interview responses of participants, the reasons for other farmers' non-participation in the CKW project is not a result of inefficient outreach on behalf of the CKWs, but rather unwillingness and disinterest from the farmers.

Much like access to a mobile phone, ease of access to the CKW was a highly important element for these farmers. While most use personal handsets to contact their CKW anytime they have a question, others, like Gowdesea Marahi, do not see the need to call then because he often "comes around" (Marahi, 2011). Eliza Mugisa provides another example when she said that she does not need to call them because they are "always here" (Mugisa, 2011). When asked to clarify, Bakuku James interpreted her response as being the "commitment of the CKWs" that always brings them into the community offering their informational services (Mugisa, 2011). Unlike many other extension workers, the CKWs are

integrated into the communities in which they serve, providing easier access for pressing needs.

6.3 Limitations of the Study

EAAI Project Limitations

Due to a backlog in funding and insufficient new materials, the Kubere Information Centre is currently experiencing a period of stagnation. It was not until the first day in the KIC office that the researcher learned that the EAAI project had not yet received their promised funding from donors since the beginning of the calendar year. As it was already November, this had greatly hampered their efforts to increase available resources and expand their influence in other parts of Apac and surrounding districts. In direct reference to this study, it was a limitation because there was little new evidence available to evaluate the effectiveness of the EAAI project for their target beneficiaries, the women farmers.

Moreover, the researcher's unplanned illness caused several days' disruption in the EAAI research schedule. With the assistance of WOUGNET staff and their family members, the researcher was able to maintain a minimum level of activity during the days of necessary rest and still collect sufficient data through less strenuous means such as reviewing past reports. This limitation did prove to be a setback, however, as the researcher was unable to stay in Apac as long as originally planned and therefore did not complete the hoped number of interviews with project participants.

CKW Project Limitations

A lack of supporting details on the available data was limiting during the analysis portion of this research. While the researcher was given several spreadsheets and datasets to work through, certain analytics features from AppLab were unavailable due to authorization issues. This limited efforts for a complete analysis of the data as the researcher was unable to gain access to specific information on AppLab's virtual dashboard.

In a similar vein, there were many farmers who asked agricultural questions to both male and female CKWs within the given month, thereby complicating the data. With the minimum of information available, the researcher had to assume the data to be accurate and conclude that it refers to only one farmer although it is known that they occasionally share ID numbers (Namubiru, 2011). In light of this, it was not possible to unambiguously determine the repeat usage rate.

Shared Limitations

Even despite the illness, the limitation of time was apparent and when considering the possible depth of interviews. Without sufficient time to establish consistent and comfortable relationships with the selected farmers, there is naturally a lack of trust throughout the interview process. While this limitation is to be expected, it does affect the level of intimacy and detail provided by the respondents.

Moreover, the language barrier proved a challenge throughout the study. Without trained translators, there were many incidences of miscommunication and incomplete responses during the data gathering process. Thus, the direct interactions between the researcher and interviewees were limited due to this element.

Despite these limitations, the shared themes produced several significant findings to strengthen the study. The following chapter takes the findings from both case studies and discusses them in conjunction with current literature in the field. Using the two projects, the chapter will also identify shared patterns as they can be transferred into relevant implications of the study.

Chapter Seven: Final Discussion and Implications

Throughout the research, data have revealed a number of shared themes and sub-themes common to both studies. These mutual findings have been extracted and are explored in this section as they relate to the overall research question. These three shared themes enhance the research aim and further explore how mobile technology may contribute to rural Ugandan farmers' social and economic livelihoods through the Capabilities Approach and social exclusion theory. Moreover, they are compared alongside the current academic literature reviewed in Chapter One. Following this analysis, the implications of mobile phones in these projects are presented in the context of agricultural production for smallholder farmers, especially female famers, farming groups and cooperatives, and finally culminating with the overall role of mobile technology for the rural agriculture sector of Uganda. The subsequent discussion of implications and recommendations are essential in the hope that tangible outputs may be accomplished as a result of this study. This chapter serves as the final segment of the research project and aims to connect the final components of findings and implications in order to establish a holistic response to the study's core issue.

7.1 Common Themes

7.1.1 Perceived Changes in Livelihood: Economic and Social Upgrading

The first commonality is the presence of perceived changes in livelihood as a result of these agricultural extension projects. In every interview, there was a reference to new or increased life opportunities as a result of agricultural information gathered through the project. Such opportunities are also directly in line with Sen's approach of achieving freedoms, a fundamental element in the overarching conceptual framework. Specific responses from each case study are addressed in greater detail in the previous chapter, but reflections from current academic literature and theoretical framework make this a noteworthy issue to pursue as a cross-cutting theme. Moreover, this discussion contributes to the first sub-question regarding any change in welfare as a result of using the mobile phone. According to the qualitative data obtained from the interviews, farmers reported mobile phones as a better means to gather necessary information in order that they may improve their economic, and ultimately social, standings.

Additionally, many mentioned the use of mobile phones in the business capacity, commenting on its usefulness to "simplify their work," a component researched by Ndung'u and Waema in their 2010 report (Ndung'u & Waema, 2010, 11; Rebecca, 2011). Many others, like farmer Eliza Mugisa, highlight how much time and travel is saved because of the mobile phone. Her comment that "you can just call" rather than moving a great distance to communicate and gather information is representative of the wider sample of farmers involved in the study (Mugisa, 2011). This finding corresponds to the 2010 report by Research ICT Africa Network, which reported that 93.7% of their respondents believe having a mobile phone makes life easier in terms of time and saving on additional costs (2010, 11). Therefore, using the mobile as a business tool allows the farmers, regardless of gender, to access opportunities for further economic freedom and ultimately social enhancement.

This cross-cutting theme is further supported by scholars like Ndung'u in her words that ICTs "enable knowledge, access, accumulation, and dissemination" (2010, 17). This greater freedom to "know what you wouldn't have known otherwise," in the words of Eliza Mugisa, is directly reflected by Masuki and Martin and Abbott in their findings that ICTs give the ability to local communities to "obtain information for sound decision-making" (Mugisa, 2011; Mesiku, 2011; Martin & Abbott, 2010, 2). Making true these studies are the interviewees, most of whom reported a greater access to knowledge gathering and sharing through the use of mobile technology. In light of these findings, this movement from a "resource need to resource access" through mobile technology reflects a major strategy in eliminating poverty as defined (Calling an End to Poverty, 2005). Therefore, it may be concluded that mobile phones, when used to gather and share information that is relevant and beneficial to the farmers' lives, may aid in the reduction of poverty.

Kasese District, Uganda- A female farmer demonstrates her new method of mulching she learned through the CKW project (photo taken by researcher, November 2011).

7.1.2 External Contributing Factors to Social Upgrading

The second shared theme corresponds to the second sub-question regarding factors external to the EEAI or CKW projects that have contributed to livelihood changes. This theme is made up of two parts: factors related directly to mobile phones and those that are an indirect result of mobile phone access and usage. Throughout each of these, the researcher found a strong undercurrent of increased access to information and increased social opportunities as major components of the reported livelihood changes.

a. Ease of communication

The sub-section topic, "ease of communication" is a direct quote from many of the interviews. In fact, this comment and similar comments were among the highest praise for the mobile's use[5]. For most of the individual and group interview participants, mobile phones were most beneficial for communication among family members, friends, and other farmers. Moreover, interviewees reported mobile phones as a means of rapid mobilisation for meetings or trainings, allowing more farmers to participate in agricultural instruction opportunities. Based on the interview responses, mobile phones demonstrated a direct link to social upgrading despite this use of mobile phones not having a role in EAAI or CKW projects specifically.

[5] See EAAI Interview Results and CKW Interview Results in Appendices 2 and 4

b. Mobile challenges

Nonetheless, this access does not come without certain challenges that decrease the opportunities for social freedoms, as Sen defines it. In fact, other interviews revealed a host of obstacles which may outweigh the potential positives. Among these, airtime, electricity for charging, and network access were the most commonly cited. Although these issues were predominantly highlighted by the EAAI interviews, the widespread electricity inconsistencies and poor network coverage in many areas of the country make these challenges applicable to rural farmers in all corners of Uganda. While addressed in greater detail later, the patriarchal traditions of certain cultural groups also negatively affected women's opportunities available through mobile phones. Thus, the social and economic upgrading that could be otherwise achieved through the mobile phone is severely limited and often dependent on factors beyond the farmer's control.

c. Association with farming groups

External to mobile phones, however, there are a number of elements from the case studies that may affect social and economic up- or downgrading. Each of the following issues has surfaced in the study as a result of mobile phones but should nonetheless to be considered as having their own influence towards a change in livelihood. First and foremost, the matter of farm groups and cooperatives linked to social networks was a strongly emphasised element in data from both case studies. Fourteen of the fifteen CKW interviewees were members and reported to have shared agricultural information from the project among the group. From the EAAI group interviews, they furthered this theme by stating that they not only share with each other in the group, but also family members and other neighbouring farmers in the field. These neighbouring farmers and family members may very well be members of different farming groups and could continue the dissemination of information. Furthermore, when asked about additional sources of farming advice, nearly all of the interviewees referenced farming groups or cooperatives near the top of the list. This shared theme stresses the prevalence and importance of active social networks for these farmers through mobile technology.

The influence of farming groups is also a two-sided issue. On one side, there is evidence from the research that groups and cooperatives provide a strong link to spread agricultural information beyond the project's named participants (Aker, 2011). This makes the impact of one specific extension project difficult to measure. However, a farming group also provides a prime setting for extensive information dissemination of advice and tips sourced from the extension project. This information relay could reflect positively on the EAAI or CKW project, but it instead poses yet another muddling factor in determining the actual scope and effectiveness of the information spread. These farmers are likely on the receiving end of information from other neighbours and relatives who have also gleaned information from their various social networks. Thus any social and economic change is likely influenced by this element though the influence of such dissemination is loosely grasped and difficult to measure. Yet despite its problem for research methodology, this issue highlights the multidimensional layers of information as they are linked to various social networks.

7.1.3 Market Access

Although also considered an external factor, the repeated theme of market access throughout the findings necessitates its own sub-section. Market access definitely has economic undertones, but its improvement also results in social upgrading which contributes to a positive change in livelihood for the farmers. It was originally expected that this positive change would be a result of the ability to acquire market prices and information through mobile phones, yet numerous interviewees expressed that this did not solve the overarching problem of actually accessing markets. This is an extremely valuable point to note as organisations often focus on providing the information without recognising the fundamental problem. This issue calls for a holistic solution that goes beyond voice or text-based information services.

To many farmers in extremely rural areas, expanding their market reach is nearly impossible due to circumstances of road conditions and low population density. Without enough people in their near vicinity to enter into the market and without opportunities to

travel or sell to a passerby, small-scale farmers are far less likely to increase their markets and through that, their economic and social livelihoods.

7.1.4 Gender

The final shared theme to consider, gender, is vital in any study of a female-dominated sector like agriculture in Uganda. While this area can and should be explored to a much greater extent in further research, this section highlights the common features from the case studies and examines them as the final external factor that may contribute or has contributed to a change in livelihood.

Throughout the WOUGNET interviews, there were few but significant mentions of the gender component regarding availability and access to a mobile phone. Some women, like Beatrice, stated that not all women are allowed to use a mobile phone, much less own one, as it may "break the balance in the house" and cause domestic problems (Beatrice, 2011). This, according to Hagan and Lal, is an example of males dominating "decision-making, capacity development and content development" as the traditional head of household (2005, 28). Numerous other scholars have studied the digital gap between genders and share conclusions that although women are the primary breadwinners, males continue to have the upper hand in technology access and use (Primo, 2005, 144; Bakesha et al., 2009, 143; Ekine, 2011). In accordance with the conceptual framework of this research, gender inequality and women's additional challenges to access opportunities through mobile technology is considered an "unfreedom," which further highlights the need for emphasis on this topic (Sen, 1999, 3).

In light of these shared findings, the core research question may be finally addressed. To ensure an accurate response to the question, it is restated from Chapter One as follows:
How are mobile phones, used in conjunction with agriculture extension projects, contributing to rural Ugandan farmers' social and economic upgrading or downgrading?

Three additional sub-questions supported the research. These questions addressed the perceived changes in welfare after using the mobile phone service, external factors that

may have also contributed to this change, and repeated usage of the agriculture extension service based on gender in order to understand mobile phone's overall influence in the issue of social upgrading.

Various angles of these sub-questions are answered through the cross-cutting themes. First and foremost, there is a mutual agreement among interviewees that accurate and relevant agricultural information contributes towards higher and/or better quality yields which may influence an increase of income and social upgrading. Yet the findings also revealed a number of external factors which may contribute towards social and economic up- or downgrading as well, whether directly or indirectly linked to the mobile phone. In line with the mobile's influence, both case studies revealed a simpler method of information gathering and sharing, ease of communication with family, friends, and other farmers, better business opportunities, and rapid mobilisation for meetings or trainings by using the mobile as a central feature in social networking. Other important findings exposed that market access and gender roles may also influence changes in livelihood, often negatively. The following section applies these findings on a practical level and suggests various implications and strategies for the key elements of this research.

7.2 Implications of the Study

From these shared themes and highlighted issues, there are a number of implications to consider. This section reveals the strength of the dissertation as it aims to provide workable and relevant implications for all involved stakeholders, participants, and target beneficiaries. These implications include, but are not limited to, issues of agricultural production and productivity for small-scale or subsistence farmers in Uganda, strengthening ties with local farming groups and cooperatives, the use of mobile phones for female Ugandan farmers, and finally the overarching role of mobile telecommunications for this sector with special attention given to rural populations. The explanation and suggestions can be adapted for policymakers, agriculture extension programme coordinators, or any organisation targeting rural populations or female empowerment with ICTs. Furthermore, organisations that incorporate the use of mobile phones in their daily

project processes may also benefit from these implications. For each of these subject areas, the research opened new avenues for potential social and economic upgrading for the end user, the rural farmer. However, such research is not without its gaps and consequently, the implications presented here will also include any further questions raised by the shared findings. These questions present specific opportunities for further research and policymaking considerations with invaluable potential for the future of this subject area.

Given that all of the participants in this study are involved in smallholder or subsistence farming, they must be considered at the forefront of importance when considering the future implications of the research. As the findings revealed, mobile phones provide an easier means of accessing relevant and necessary information particularly in the agriculture section. Even in the case of the CKW project where participants may not personally use the mobile, the farmers reflected optimistically on the information gleaned from the CKW's smart phone database. While this relationship between mobile phones and agricultural information seems to be moving in a positive direction for the farmers, the obstacles and external factors that come alongside this progress cannot be ignored. In addition to infrastructure issues like electricity, airtime deductions, and network coverage, there is a practical and ever-important consideration of physical markets. Current market prices available through a farmer's mobile phone may eliminate the loss of profit to the middleman, but the information is useless if they cannot find buyers for their products. Very few agriculture organisations have successfully tackled the issue of connecting small-scale farmers to local or regional buyers via personal mobile phones, although it is in the developing or pilot stages for some. This issue is one that should be expedited as much as possible by both the EAAI and CKW projects in order to be able to offer the most effective service possible to their target beneficiaries.

On the other hand, using mobile phones in conjunction with farming groups may have positive repercussions in the future for both the farmer and the agriculture project. Given that the vast majority of participating farmers in this study are also active members of farming groups or cooperatives, the potential for mutual enhancement is another noteworthy element to highlight. In the EAAI project, they use the mobile phone to

communicate with group leaders about upcoming meetings and trainings in addition to the two-way flow of information dissemination. Some of the farmers participating in the CKW project also mentioned their farming group as using the CKW as a regular contact for any questions or concerns that arise throughout the planting and harvesting seasons. As a final reasoning, group membership of farmers has a tendency towards better market access as they are able to sell products collectively (Hill, Bernard, & Dewina, 2008, 3). If agriculture extension programmes are striving to improve the situation of their target beneficiaries, it would be in their best interest to engage more intentionally with the local social networks through farming groups and cooperatives.

The implications for female farmers are impossible to discuss holistically in such a narrow context. Therefore, the researcher chooses to discuss this aspect in the broader scope of rural Ugandan females, the majority of whom happen to be farmers and have access to a mobile phone handset. Like any community rooted in long-standing patriarchal traditions, there are certain restrictions that appear "built-in" to the issue of women's opportunities for certain freedoms. These obstacles may prove challenging for generations to come, but there are certain elements that can be utilised now in order to maximise the effectiveness of mobile phones for addressing the information needs of rural Ugandan women.

Understanding this, gender balance should be emphasised in order to increase the likelihood of not only beneficial, but also sustainable agriculture extension projects or programmes. By incorporating both males and females in the planning and implementation process of a new initiative, the organisation may be able to circumvent obstacles that would have otherwise muffled the female voice. Moreover, involving both genders allows village males, husbands, and local leaders to better understand the motivation for the project as being intended for upward social and economic development for the entire community. Rather than regarding a female-focused project with suspicion and mistrust, well-rounded participation gives way to transparency and opportunities. However, it must be noted that these outcomes are not guaranteed and that every situation requires context-specific adjustments to be most effective. There are certain circumstances that warrant female-run and female-focused projects, especially in highly patriarchal societies where

male cooperation may not be possible. In such cases, it is in the best interest of the organisation or initiative to focus on female empowerment and only involve local males to the extent that is it beneficial without undermining the aims of the project.

Finally, one must consider the overarching implications for the agriculture sector. With the availability of telecommunications in rural areas on the rise, it may well become common practice to secure information like daily market prices through SMS, call centres, or pre-recorded messages. As the use of mobile phones in this sector increases, agriculture extension projects and programmes must ensure their information remains up-to-date, in line with local crops, and sensitive to specific needs or traditions of the targeted areas. As the findings showed, information received through the mobile phone alone is not enough to cause social upgrading. Therefore, it is futile to relay farming advice that cannot be followed due to a lack of necessary inputs. Organisations like AppLab and WOUGNET must be flexible to adjust and extend their strategy in this case. As for the farmers themselves, this research has demonstrated that they are well-competent to use the mobile phone to retrieve their own information needs if there is an organised structure in place. A lack of electricity for charging or poor signal sends these opportunities into disarray and creates further obstacles the marginalised farmers who cannot easily access the available information. If this trend continues and marginalised communities, namely the very rural and women farmers, are unable to consistently gather information they require to work in the field, the disparity between those who can and those who cannot will surely widen. The mobile phone can be a tool of freedom for the farmers, but for those who cannot access it- be it from social, economic, or environmental constraints- find themselves further excluded from the opportunity for social upgrading.

Future studies should also aim to address the questions revealed through this research. For example, how do additional factors, external to information gathered through the mobile phone but within the scope of agriculture extension programmes, affect farmers' social or economic upgrading? One illustration of this is the cost of airtime. While it may somewhat diminish the farmer's opportunities for economic upgrading, if the information received after purchasing airtime translates into higher yields and better market access, it may

outweigh the costs associated with mobile phone use. Other issues to consider include increased access to markets, electricity availability for charging, increasing network coverage, low literacy rates in rural areas, and working within culturally-defined gender roles. Therefore, organisations and policymakers focused on information dissemination must consider the wider picture and should avoid narrow solutions to the complex obstacles farmers face.

The implications presented here are a result of the cross-cutting themes and, when used alongside complimentary reports and other recent research findings, hold the potential to contribute towards a better understanding of the role of mobile phones in agriculture extension projects for rural farmers in Uganda. This relationship may in fact be a primary building block to create a "*Uganda where national development... {is} sustainably enhanced, promoted and accelerated by efficient application and use of ICT, including timely access to information"* (Uganda's Working Document for the Second Preparatory Meeting for the World Summit on the Information Society, 2003, 4).

Chapter Eight: Conclusion

Using current research and fieldwork findings as the base, this study explored the various components that must be considered to establish how mobile phones, when used in conjunction with agriculture extension projects, contribute towards social and economic upgrading or downgrading for rural Ugandan farmers. As the study showed, there are features associated with mobile phones that indicate an increase of social and economic opportunities as well as elements that may hinder or render the mobile phone's impact as neutral regarding a change in livelihood.

In terms of mobile phones in these agriculture extension projects, the overall findings indicated a positive association between mobile phones and information gathering, potentially leading to an increase in the farmers' social and economic livelihoods as a result of new farming techniques and advice. The majority of the interviews reported a sense of social or economic change for the better from having access to a mobile whether through ownership or borrowing.

The most common positive connections between mobile phones and social upgrading revolved around the ease of communication and opportunities to obtain information and answers to problems in a timely and cost-effective manner. The elements that proved challenging were most often external to the CKW or EAAI project and included a lack of access to markets, culturally-defined gender roles, limited network availability, and upkeep of the mobile phone through charging and airtime. Thus there are numerous external factors to consider before a direct connection can be drawn from mobile phones to social upgrading.

Two important external considerations from the findings include group membership and market access. While group membership contributes towards increased social networks for the farmers and demonstrates positive associations with information gathering and dissemination, the lack of physical markets continues to be a significant obstacle for social upgrading.

From this, the research has determined that advice and information received through the mobile phone are not enough to independently lead to social upgrading. Yet amidst multiple external contributors to a farmer's current and potential upgrading, the opportunity to readily access agricultural information through the mobile phone is a sizeable step in the right direction.

References

About KIC. (2009, April 14). Retrieved September 13, 2011, from Kubere Information Centre: http://kic.wougnet.org/index.php?option=com_content&view=article&id=1&Itemid=2&lang=en

About Us. (2009). Retrieved September 13, 2011, from Women of Uganda Network: http://www.wougnet.org/cms/content/view/20/33/

Abraham, I., Chechik, S., Kempe, D., & Slivkins, A. (2012). *Low-Distortion Inference of Latent Similarities from a Multiplex Social Network.* Ithaca: Cornell University Library.

Accenture, V. G. (2011). *Connected Agriculture: The Role of Mobile in Driving Efficiency and Sustainability in the Food and Agriculture Value Chain.* Berkshire: Vodafone.

Access4Dev Projects. (2009). Retrieved September 13, 2011, from Women of Uganda Network: http://www.wougnet.org/cms/content/blogcategory/52/96/

African IT Spend to Reach USD25bn in 2011. (2011). Retrieved August 4, 2011, from One World Africa: http://africa.oneworld.net/campaign/african-it-spend-to-reach-usd25bn-in-2011

Aker, J. C. (2011). *Dial "A" for Agriculture: A Review of Information and Communication Technologies for Agricultural Extension in Developing Countries.* Washington, DC: Center for Global Development.

Apac, Uganda. (2012). Retrieved November 21, 2011, from Google Maps: http://maps.google.co.za/maps?q=apac+uganda&hl=en&hnear=Apac,+Northern+Region,+Uganda&t=m&z=14

Arnquist, S. (2009, October 9). In Rural Africa, a Fertile Market for Mobile Phones. *The New York Times*, p. 4.

ASA Code of Ethics. (n.d.). Retrieved March 21, 2012, from American Sociological Association: http://www.asanet.org/about/ethics.cfm

Babisky, T. T., & Salmons, J. F. (2006). Affecting Change from the Grassroots: Making a Difference without Power, Prestige, or Money. In H. Rahman, *Empowering Marginal Communities with Information Networking* (pp. 62-93). Hershey: Idea Group Publishing.

Bakesha, S., Nakafeero, A., & Okello, D. (2009). ICTs as Agents of Change: A Case of Grassroots Women Entrepreneurs in Uganda. In I. Buskens, & A. Webb, *African Women & ICTs: Investigating Technology, Gender and Empowerment* (pp. 143-154). Pretoria: Unisa Press.

Beatrice. (2011, November 15). (R. Piontak, Interviewer)

Burrell, J., & Matovu, J. (2008). *Livelihood and the Mobile Phone in Rural Uganda.* Berkeley: Grameen Foundation USA.

Callan, T., Nolan, B., & Whelan, C. T. (1993). Resources deprivation and the measurement of poverty. *Journal of Social Policy*, 141-172.

Calling an End to Poverty. (2005, July 9). *Economist* .

Communications in Uganda. (2009, July). Retrieved January 10, 2012, from ITU News: http://www.itu.int/net/itunews/issues/2009/06/31.aspx

Cullum, B. T. (2010). *Informing Development: Mobile Telephony, Governments, and Local Stakeholders in Africa.* Washington D.C.: Georgetown University.

Dashboard: Jan-March 2012. (2012, February 3). Retrieved February 3, 2012, from Grameen Foundation: http://grameenfoundation.force.com/ckw/apex/Dashboard?sfdc.tabName=01r70000000HaJA

Data: Uganda. (2012). Retrieved March 3, 2012, from World Bank: http://data.worldbank.org/country/uganda

Duncombe, R., & Heeks, R. (2001). *Information and Technology in Developing Countries: A Handbook for Entrepreneurs in Developing Countries.* Manchester: Institute for Development Policy and Management.

Ekine, S. (2011, March). Africa: Technology Rings the Changes. *New Internationalist* , 11.
(2005). *En Route to Equality: A Gender Review of National MDGN Reports.* United Nations Development Programme.

Eric, M. (2011, December 1). (R. Piontak, Interviewer)

Ethier, J. (2006). *Current Research in Social Network Theory.* Boston: Northeastern University.

Ethiopian Livestock Market Information System. (n.d.). Retrieved January 23, 2012, from LINKS Global Livestock: http://www.lmiset.net/Pages/Public/Home.aspx

Ezra, M. (2011, November 30). (R. Piontak, Interviewer)

Fisheries Resources. (2012). Retrieved March 2, 2012, from Ministry of Agriculture, Animal Industry, and Fisheries: http://www.agriculture.go.ug/index.php?page=departments&id=87

Frikan, S. (2011, November 30). (R. Piontak, Interviewer)

Gabriel, M. (2011, November 30). (R. Piontak, Interviewer)

Gyory, M. L. (2010). *The Effects of Mobile Phone Ownership on Development Indicators in Uganda.* Washington D.C.: Georgetown University.

Hagen, I., & Lal, R. (2005). Scaling up Development Initiatives through ICT: Potentials and Challenges. In R. A. Rahim, D. Waldburger, & G. S. Muinde, *Access, Empowerment & Governance: Creating a World of Equal Opportunities with ICT* (pp. 14-31). Kuala Lumpur: Global Knowledge Partnership.

Hahn, J. (2010, December 15). *Engendering Our Work in Uganda: Grameen Foundation's Community Knowledge Workers*. Retrieved October 18, 2011, from BMGF Market Access and Farmer Productivity Online Community.

Heeks, R., Jagun, A., & Whalley, J. (2007). *Mobile telephony and developing country micro-enterprise: A Nigerian case study.* Retrieved September 10, 2011, from http://www.sed.manchester.ac.uk

Henrietta. (2011, November 17). (R. Piontak, Interviewer)

Hill, R. V., Bernard, T., & Dewina, R. (2008). *Cooperative Behaviour in Rural Uganda: Evidence from the Uganda National Household Survey 2005.* Washington DC: International Food Policy Research Institute.

Hudson, H. (2006). *From Rural Village to Global Village: Telecommunications for Development in the Information Age.* New Jersey: Lawrence Erlbaum Associates.

Hughes, N., & Lonie, S. (2007). M-Pesa: Mobile Money for the "Unbanked" Turning Cell phones into 24-hour Tellers in Kenya. *Innovations*, 66-81.

(2006). *Impact of International Agricultural Trade and Gender Equity: Selected Country Case Studies.* Food and Agriculture Organization (FAO) of the United Nations.

(2009). *Information Society Statistical Profiles 2009: Africa.* Addis Abba: International Telecommunication Union.

Islam, M. A., Mrelli, E., Noronha, F., & Rahman, H. (2006). Capacity Development Initiatives for Marginal Communities: A Few Case Studies. In H. Rahman, *Empowering Marginal Communities with Information Networking* (pp. 318-351). Hershey: Idea Group Publishing.

James, J., & Versteeg, M. (2007). Mobile Phones in Africa: how much do we really know? *Social Indicators Research*, 117-126.

Johnson, N. (2011, December 1). (R. Piontak, Interviewer)

Kanellopoulus, D. N. (2011). How can teleworking be pro-poor? *Journal of Enterprise Information Management*, 8-29.

Kayabwe, S., & Kibombo, R. (2003). *Enhancing Access to Agricultural Information using ICTs: A Final Report.* WOUGNET.

(2011). *Key Informant Interview Report.* WOUGNET.

Kyahuliro, B. F. (2011, December 1). (R. Piontak, Interviewer)

Lugano, G. (2008, November 2). Mobile Social Networking in Theory and Practice. *First Monday* [Online]*, 13*(11).

Macueve, G., Mandlate, J., Ginger, L., Gaster, P., & Macome, E. (2009). Women's Use of Information and Communication Technologies in Mozambique: A Tool for Empowerment? In I. Buskens, & A. Webb, *African Women & ICTs: Investigating Technology, Gender, and Empowerment* (pp. 21-33). Pretoria: Unisa Press.

Marahi, G. (2011, November 30). (R. Piontak, Interviewer)

Martin, B., & Abbott, D. E. (2010). *Development Calling: The Use of Mobile Phones in Agriculture Development in Uganda.* Greenlee School of Journalism and Communication, Iowa State University.

Mesiku, C. (2011, October 26). *Study Finds Mobile Phones Empower Rural Farmers*. Retrieved December 14, 2011, from World Agroforestry Centre: http://worldagroforestry.org/newsroom/highlights/study-finds-mobile-phones-empower-rural-farmers

Ministry of Gender, Labour and Social Development. (2008). *National Report on the Development and State of the Art of Adult Learning and Education (ALE) in Uganda.* Kampala.

Mission, Vision, and Approach. (2012). Retrieved March 7, 2012, from AppLab: Grameen Foundation: http://www.grameenfoundation.applab.org/section/mission-vision-and-approach

Mobile Communications in Uganda. (2010). Retrieved September 5, 2011, from Audience Scapes: http://www.audiencescapes.org/country-profiles/uganda/country-overview/mobile-communications/mobile-communications-284

Mugisa, E. (2011, November 30). (R. Piontak, Interviewer)

Muhindo, A. (2011, November 30). (R. Piontak, Interviewer)

Mutula, S. M. (2007, July). Digital Divide and Economic Development: Case Study of Sub-Saharan Africa. *Emerald Insight*, 468-489.

Mutula, S. M., & Mostert, J. (2009, January). Challenges and Opportunities of E-government in South Africa. *Emerald Insight*, 38-53.

Namubiru, L. (2011, November 9). Monitor and Evaluation Head. (R. Piontak, Interviewer)

Ndung'u, M. N., & Waema, T. M. (2010). *Development Outcomes of Internet and Mobile Phone Use in Kenya: The Households' Perspective.* Nairobi: University of Nairobi.

Odame, H. H. (2005). Introduction: Gender and ICTs for Development: Setting the Context. In K. (. Institute), *Gender and ICTs for Development: A Global Sourcebook* (pp. 13-24). Amsterdam: KIT Publishers.

Okello, D. (2010, December 15). *e-Agriculture for Rural Women Farmers: The WOUGNET Experience*. Retrieved September 13, 2011, from E-Agriculture: http://www.e-agriculture.org/blog/e-agriculture-rural-women-farmers-wougnet-experience

Okello, D. (2011, May 23). *The Democracy of Technology*. Retrieved September 2011, 30, from ICT Update: http://ictupdate.cta.int/Feature-Articles/The-democracy-of-technology

OneWorld. (2009). *Mobile4Good: Critical Informational for Vulnerable Communities.* London: OneWorld UK.

Orib Can Barwelo Women's Group. (2011, November 17). (R. Piontak, Interviewer)

Orib Cing Oumi Women's Group. (2011, November 16). (R. Piontak, Interviewer)

Otto, L. (2011, December 2). Bringing Development to Africa: How the Mobile Phone Industry is Helping. *Consultancy Africa*.

Parliament of Uganda. (2009). *Report of Sessional Committee on Information and Communications Technology on the Ministerial Policy Statement and Budget Estimates for the Ministry of Information and Communications Technology for the Financial Year 2009/2010.* Kampala: Eight Parliament.

Paulin, M. (2011, December 1). (R. Piontak, Interviewer)

Primo, N. (2005). The Potential of ICT for Promoting Gender Equality. In R. A. Rahim, D. Waldburger, & G. S. Muinde, *Access, Empowerment & Governance: Creating a World of Equal Opportunities with ICT* (pp. 144-157). Kuala Lumpur: Global Knowledge Partnership.

Rebecca, B. (2011, December 1). (R. Piontak, Interviewer)

Research ICT Africa Network. (2010). *Annual Report.*

Ringen, S. (1986). Poverty in the Welfare State? *International Journal of Sociology*, 122-138.

Rodgers, B. (2009, March 9). *Developing Countries Employ 'Leapfrog Technology' with Cell Phones*. Retrieved December 12, 2011, from The Cutting Edge: http://www.thecuttingedgenews.com/index.php?article=11174&pageid=28&pagename=Sci-Tech

Rural Poverty in Uganda. (2010). Retrieved March 2, 2012, from Rural Poverty Portal IFAD: http://www.ruralpovertyportal.org/web/guest/country/statistics/tags/uganda

Scan Pe Kun Women's Group. (2011, November 16). (R. Piontak, Interviewer)

Scovia, M. (2011, November 30). (R. Piontak, Interviewer)

Sen, A. (1999). *Development as Freedom.* Oxford: Oxford University Press.

Sen, A. (2000). *Social Exclusion: Concept, Application, and Scrutiny.* Manila: Asian Development Bank.

Shrum, W., Mbatia, P. N., Palackal, A., Dzorgbo, D.-B. S., Ynalvez, M. A., & Duque, R. B. (2011). Mobile Phones and Core Network Growth in Kenya: Strengthening Weak Ties. *Social Science Research*, 614-625.

Sivas, A. (2011, November 30). (R. Piontak, Interviewer)

Susan, B. (2011, November 30). (R. Piontak, Interviewer)

Uganda. (2011, July 20). Retrieved March 2, 2012, from Food and Agriculture Organization of the United Nations: http://www.fao.org/countries/55528/en/uga

Uganda Exports. (2011). Retrieved March 5, 2012, from Uganda Export Promotion Board: http://www.ugandaexportsonline.com/exports.htm

Uganda Project: AppLab Uganda. (2011). Retrieved September 24, 2011, from AppLab: http://www.grameenfoundation.applab.org/section/applab-initiatives

Uganda's Working Document for the Second Preparatory Meeting for the World Summit on the Information Society (WSIS). (2003, February). Geneva.

United Nations Development Programme. (2001). *Human Development Report 2001: Making Technologies Work for Human Development.* New York: Oxford University Press.

Violet, B. (2011, November 30). (R. Piontak, Interviewer)

Vodafone. (2005). The Impact of Mobile Phones: Africa. *The Vodafone Policy Paper Series No. 2*, 1-69.

Voigt, K. (2011, October 9). *Mobile Phone: Weapon Against Global Poverty*. Retrieved December 9, 2011, from CNN Tech: http://articles.cnn.com/2011-10-09/tech/tech_mobile_mobile-phone-poverty_1_mobile-phone-cell-phone-rural-villages?_s=PM:TECH

Waverman, L., Meschi, M., & Fuss, M. (2005). *The Impact of Telecoms on Economic Growth in Developing Countries.* Vodafone Policy Paper Series 2.

WOUGNET. (2010). *Gender, ICTs, and Rural Livelihoods.* Kampala: Women of Uganda Network.

WOUGNET. (2008). *Rural Women's Voices Project, Apac District: Implementation Area, Apac District, Northern Uganda.* Kampala: Women of Uganda Network.

Appendix 1: EAAI Interview Schedule

November 16, 2011:

- Orib Cing Women's group in Oumi parish in Bala sub-county in Kole district

  13 Participants: 10 Females, 3 Males

- Scan Pe Kun Women's group in Angic parish in Bala sub-county in Kole district

  25 Participants: 23 Females, 2 Males
  Daily total participants: 38

November 17, 2011:

- Henrietta: Her home compound just a few kilometres outside of Apac town

  1 Participant: Female

- Orib Can Women's Group in Barwelo village in Atana parish in Apac sub-county, Apac district

  9 Participants: 9 Females

Daily total participants: 10
Final total of participants: 49
Gender breakdown of total participants: 44 Females, 5 Males

Appendix 2: EAAI Interview Results

- *Do you own a mobile phone or does someone in your family own a mobile phone that you can use?*

**None could access the internet from their phones*
15 Nov (Rachel): Yes, and so do 2 of the 25 women in the group although some of the women's' husbands don't allow them to use it because it would "break balance in the house."
16 Nov 1 (Walter): Seven had phones but about 8 don't have phones.
16 Nov 1 (Rachel): Seven of the group members have phones (this includes spouses).
16 Nov 2 (Walter): Seven people own phones.
16 Nov 2 (Rachel): Eight or 9 in the group own phones (or share with husbands is likely).
16 Nov 2 (Brenda Otika): Eight people in the group own a phone.
17 Nov 1 (Rachel): Yes.
17 Nov 1 (Brenda Otika): Yes.
17 Nov 2 (Rachel): All have access to a mobile (or within the family there is at least one mobile).
17 Nov 2 (Brenda Otika): Yes.

- *Do you have access to this mobile phone anytime you need it?*

15 Nov (Rachel): Yes, because all of the women share.
16 Nov 1 (Walter): Not really- network, and limited airtime, battery charging, and call costs are reasons why they do not always have access.
16 Nov 1 (Rachel): No- reasons like network, airtime, deductions for underuse, airtime network issues, charging (no power) were given.
16 Nov 1 (Brenda Otika): No- reasons like network is on and off, costs to load airtime, low battery, and MTN always chops their money were given.
16 Nov 2 (Rachel): All have access if they need it.
16 Nov 2 (Brenda Otika): Yes, they often borrow and load airtime.
17 Nov 1 (Rachel): N/A
17 Nov 1 (Brenda Otika): N/A
17 Nov 2 (Rachel): Not necessarily because a husband or son might now allow it.
17 Nov 2 (Brenda Otika): Not always because of a poor network, low battery, and no airtime.

- *Does being a woman make it difficult for you to gain access to a mobile phone? If yes, explain why.*

15 Nov (Rachel): yes, because sometimes men in the house don't allow it.

- *Have you ever asked an agricultural question to the KIC using your mobile phone? If no, why not?*

15 Nov (Rachel): yes, she asked the vet for chicken medicine because every 3 months they had a rampant disease and they got vaccinations. So now, every 3 months all the women pool their money and they buy a bottle of the vaccination to vaccinate all the chickens.
16 Nov 1 (Walter): Yes, about farming programmes and pests disturbing crops.
16 Nov 1 (Rachel): Yes, they asked about crop pesticides and got what they needed.
16 Nov 1 (Brenda Otika): Yes, they asked about pests that were affecting their crops and they had this issue addressed.
16 Nov 2 (Walter): Yes, about farming.
16 Nov 2 (Rachel): Many have called with phone and it has helped with their agriculture problem and another mentioned a problem with soya.
16 Nov 2 (Brenda Otika): Yes, about keeping a water source, rearing young goats separately from small goats, the spacing of soya, growing of cabbage, and spraying.
17 Nov 1 (Rachel): Yes, about the problem of a disturbing goat and cow.
17 Nov 1 (Brenda Otika): Yes, she had a sick goat and calf so she asked for medicines.
17 Nov 2 (Rachel): Yes, on a variety of topics.
17 Nov 2 (Brenda Otika): N/A

- *If yes, did the answer solve your problem/answer your question?*

15 Nov (Rachel): Yes, see above answer.
16 Nov 1 (Walter): It did answer our question.
16 Nov 1 (Rachel): Yes.
16 Nov 1 (Brenda Otika): Yes, the answer solved the problem.
16 Nov 2 (Walter): Yes.
16 Nov 2 (Rachel): They had a question about a water source, spacing of soya, and goat rearing- with the last one they were told to separate the old and young.
16 Nov 2 (Brenda Otika): Yes, their problems have often been solved.
17 Nov 1 (Rachel): Yes, it got better.
17 Nov 1 (Brenda Otika): Yes, the answer solved her problem and the goat is actually still alive.
17 Nov 2 (Rachel): Yes, they asked about how to store crops after harvesting and now to space and place, and they followed the steps given and it helped. Also, the group leader, Helen, called with a question on leadership because the group had a problem and it also helped.
17 Nov 2 (Brenda Otika): Yes.

- *Did you share this information with other farmers also (the answer to your question)?*

15 Nov (Rachel): Yes, with the other women in the group.
16 Nov 1 (Walter): Yes, during meetings and in fields/gardens.
16 Nov 1 (Rachel): Yes, they share with each other and others when they're in the field.
16 Nov 1 (Brenda Otika): Yes, they do, when in the field working and also during their group meetings.
16 Nov 2 (Walter): Yes, about cabbage growing and soya beans.
16 Nov 2 (Rachel): Yes. For example, one farmer told her brother-in-law about the cabbage question and now it grows it that way.
16 Nov 2 (Brenda Otika): Yes, she taught her brother-in-law how to grow and maintain cabbages and currently he is doing well.
17 Nov 1 (Rachel): Yes, in group meetings- which have about 30 participants.
17 Nov 1 (Brenda Otika): During group meetings, yes.
17 Nov 2 (Rachel): Yes, they share among groups and elsewhere in case they have the same problem.
17 Nov 2 (Brenda Otika): Yes, they share among themselves and with neighbours.

- *If yes, how many other farmers did you share the information with?*

15 Nov (Rachel): Twenty-four, which is the number of women in the farmers group.
16 Nov 1 (Walter): Twenty to twenty-five.
16 Nov 1 (Brenda Otika): The Alulu group which normally has 15-20 members.
16 Nov 2 (Walter): Can't estimate.
16 Nov 2 (Rachel): They aren't sure because one farmer said you could tell someone about something, but it may not be their interest so they will not use the information.
16 Nov 2 (Brenda Otika): They can't tell the number since people always receive such information with mixed reaction.
17 Nov 1 (Rachel): N/A
17 Nov 1 (Brenda Otika): They're 30 members.
17 Nov 2 (Brenda Otika): Currently there are 17 from 30 members.

- *Do you plan to ask the KIC more questions in the future?*

15 Nov (Rachel): Yes.
16 Nov 1 (Walter): They really want and like it so much.
16 Nov 1 (Rachel): Yes.
16 Nov 1 (Brenda Otika): Yes and also hope that KIC will link them up with other NGOs.
16 Nov 2 (Walter): They are very willing to ask KIC questions about markets, improved cultivating methods, pesticides, and insecticides. Also they want to ask about adult education and health education about HIV/AIDS.

16 Nov 2 (Rachel): Yes, but they kept emphasising a need for a market for their products and wanted to ask about pesticides for their crops and mentioned that extension workers are needed here because the ones by the government don't come this far to the 'grassroots.' They also expressed needs like reading/writing/basic education. They may have misunderstood the question by posing their questions rather than stating whether they plan to ask more questions to KIC in the future.
16 Nov 2 (Brenda Otika): Yes. There is a need for markets for their produce (Contact Apac District Farmer's Association) and extension workers based at sub-county level. There is also a need for straying of seedlings so that they are not damaged by pests and a need for ox plough and oxen.
17 Nov 1 (Rachel): Yes and will continue.
17 Nov 1 (Brenda Otika): Yes.
17 Nov 2 (Rachel): Yes they plan to continue, although they mentioned that they need markets for their products.
17 Nov 2 (Brenda Otika): Yes, knowledge is never enough for one- they asked if KIC can get for them market for their produce, and they need for exchange visits to learn from other farmers.

- *Other than through the EAAI project, where do you get farming advice and information?*

15 Nov (Rachel): KIC, radio programmes, and SMS (which are all through the EAAI project).
16 Nov 1 (Walter): NAADS, ADAN, FAO, NARO, and REDSCRAP.
16 Nov 1 (Rachel): The government and other organisations, ADAN, and the faculty of agriculture from Makerere University. The group also meets for a day each week and shares information, but they all have their own cultivation groups too and share with them.
16 Nov 1 (Brenda Otika): The government program NAASS, FAO, ADAN, NARO, REDS (or REOS), DFID, Faculty of Agriculture at Makerere (they even did a demonstration garden for soya beans).
16 Nov 2 (Walter): NAADs, FAPAD (Facilitation for Peace and Development), and Lango Organic.
16 Nov 2 (Rachel): NAADs, FAPAD, and Lango Organic.
16 Nov 2 (Brenda Otika): NAADs, FADAD, and Lango Organic.
17 Nov 1 (Rachel): She listens between 4-5pm to the radio programme and responds afterwards.
17 Nov 1 (Brenda Otika): N/A
17 Nov 2 (Rachel): NAADS, AIDS supports organisation, PASD (Pioneers Action for Sustainable Development), and VEDCO.
17 Nov 2 (Brenda Otika): TASO, PASUD for how to handle land issues and agriculture, VEDCO, NAADS, and CESVI, who gave them seedlings.

- *Has your farming business improved since being a part of this project (spending less and producing more, or seller at a higher price, etc.)? (If yes) How so?*

15 Nov (Rachel): It helps with tips and advice, so yes.
16 Nov 1 (Walter): It has improved- they bought chairs for rent, and brought sprayers and ox-ploughs, but still sell at lower prices because of no markets.
16 Nov 1 (Rachel): It has increased, they bought a pump and the chairs we're sitting in- they were able to buy these with their increased money. But sometimes they put in a lot of capital and labour, but external factors like sun or rain make the yield low.
16 Nov 1 (Brenda Otika): Yes, they have sold produce and bought taplins for hire, chairs, oxen ploughs and a pump spray (also for hire). The challenge, however, is that season changes often affect their output (so they could have really high yields in one season and not in another).
16 Nov 2 (Walter): It has improved; they bought a bull and are more acquainted with cultivation. They also have high yields now but still low prices with crops like soup beans and cabbage.
16 Nov 2 (Rachel): Yes, their farming has improved because through training, they've learned how to cultivate and space crops like soya. They have gotten higher yields, but prices have been so low lately that there hasn't been a huge economic improvement. They try to hold off selling until the market is better, but sometimes they need to sell for any money at all.
16 Nov 2 (Brenda Otika): Yes, they now know how to space the different crops well and were able to buy a cow because of the high yields. However, the price of sunflower went down from the promised 1200 to 500 or 600 shillings.
17 Nov 1 (Rachel): Farmers have improved; there are lots of good changes like saving and loan sharing.
17 Nov 1 (Brenda Otika): Yes, there are lots of changes such as higher yields.
17 Nov 2 (Rachel): Yes, they now know *which* crops to grow and how to cultivate and how to re-use a field when it's been over cultivated. (A general note: as far as economic improvement goes, the lack of market is the problem now, not agriculture information.)
17 Nov 2 (Brenda Otika): Yes, they have learned how to identify crops that will bring more money and how to work on over-cultivated land to make it regain its virginity. They also now use oxen and ploughs in making the produce, which leads to lower costs.

- *Are you doing something completely new that you learned from EAAI (such as planting a new crop or selling it in a new place or way)?*

15 Nov (Rachel): Now, in the women's groups, they are producing sunflower together by each person having at least one acre. They have since had to drop the price because of

overproduction, which is a shame. Now she is planting according to what the radio programme says, which is new.
16 Nov 1 (Walter): They are now planting sunflower and soya beans and selling it at the local markets. They have also learned group togetherness and new cultivation patterns.
16 Nov 1 (Rachel): They are learning the importance of group farming and cultivation, of planting sunflower and soya (still sold in local markets) and new methods of cultivation of those crops.
16 Nov 1 (Brenda Otika): Yes, new crops such as sunflower alongside maize which they sell in the local market. Initially they didn't know the importance of group farming, but now they have SACCOS.
16 Nov 2 (Walter): They are planting new types of beans, soya beans, sunflower, sweet potatoes (orange flesh), and maize, but there are no markets.
16 Nov 2 (Rachel): Yes, they are now planting different varieties of cassava, orange flesh sweet potatoes, and sunflower. They tried soya and certain varieties of beans which were successful, but the demand for the beans is not very high, so they mostly feed their families with it.
16 Nov 2 (Brenda Otika): Yes, they planted soya and kaula, sunflower, mount meru, sweet potatoes (orange fresh), cassava (acena), and are looking for market for their products.
17 Nov 1 (Rachel): They gained lots of experiences like planting rice. It should not be cast, but rather planted in rows.
17 Nov 1 (Brenda Otika): Yes, learned to plant rice in rows from the radio programmes.
17 Nov 2 (Rachel): They formed a village savings organisation and can now individually buy ploughs and cows; they have been able to buy their own radios. Also, the new crops of bananas and tomatoes have helped send their children to school, according to one of the farmers.
17 Nov 2 (Brenda Otika): Yes, VSAs (village saving organisation) have increased their livelihoods because bananas and tomatoes bring money. Members are also individually buying cows and ox-plough to work on their land and have individually procured radios and they listen to them.

- *Are there other women farmers in your area that do not use this service? If so, why do you think that they do not use it?*

15 Nov (Rachel): Every woman wants to use a phone, but not all have access to it.
16 Nov 1 (Walter): They exist but have no mobile phones because a lack of sensitisation.
16 Nov 1 (Rachel): They do not yet know how to use mobile phones.
16 Nov 1 (Brenda Otika): N/A
16 Nov 2 (Walter): There are groups and they use their mobile phones to call.
16 Nov 2 (Rachel): They know of other farmers who are not part of this official women's group but listen to the radio programme and call with questions.

16 Nov 2 (Brenda Otika): Yes, there is one group that listens to the KIC radio programme will call to ask questions.
17 Nov 1 (Rachel): Many people have radio, but do not listen. Some people listen individually, but their group listens all together.
17 Nov 1 (Brenda Otika): Yes, many people have radios but they do not listen to the radio programmes.
17 Nov 2 (Rachel): Yes, because they are not as connected with KIC as these women are.
17 Nov 2 (Brenda Otika): Yes, groups that are not members of the KIC.

- *What is the most important part about having a mobile phone for you?*

16 Nov 1 (Walter): It reduces transport costs, connections are made easier, meetings are possible, market prices are known easily, meetings are held on few phone calls, and no marketing through the phones.
16 Nov 1 (Rachel): It saves on costs to meet someone ("just call"), communications, access market prices, and provides the ability to navigate problems and make announcements through the mobile. Also mobilisation purposes are important.
16 Nov 1 (Brenda Otika): It leads to reduced costs, eased communication, easy access to market prices, mobilisation, and easy access to extension workers.
16 Nov 2 (Walter): It is good for mobilising for new markets, meeting members, new information, solving problems from far areas, and mobile money transactions.
16 Nov 2 (Rachel): It connects them, helped them to get new information, and mobile money.
16 Nov 2 (Brenda Otika): It provides access to new information, linking them up with friends, and access to mobile money.
17 Nov 1 (Rachel): It is good for helping with communication (if there needs to be an abrupt meeting), and they can access any extension workers at any time. They can also access market prices and go directly to people in Kampala, thus cutting out the middle man. It is close to town so the network is okay. Sometimes charging takes 3-4 days because she goes to someone's place with solar power. Only a few go to workshops so only a few are informed about things like market prices (she says she is one of those informed people).
17 Nov 1 (Brenda Otika): It connects with buyers directly to come and buy their produce and leave out the middle man.
17 Nov 2 (Rachel): It is good to make and receive announcements, for mobilisation, to get market information; they can access exam results of their kids, and mobile money.
17 Nov 2 (Brenda Otika): It is good for announcements, mobilisation, market information from the radio, mobile money, and to access results for their children's school exams.

- *How does it affect your daily life?*

16 Nov 1 (Walter): There are issues are charging and airtime. There is a poor signal of radio, accessing power is difficult, there is poor marketing and pricing, and farming loans not available.
16 Nov 1 (Rachel): It is hard to maintain expenses and a man said the radio signal is not always so good. Even though they get access to market prices through mobiles, they still don't have access to the markets themselves because of bad roads or the town being too far away. An organisation had promised to provide solar power for charging but it didn't work and there has been no follow-up yet. Although they are able to get the best market prices, they lack a market in which to sell products. KIC staff emphasise the importance of selling in groups to not get cheated but the farmers said it's hard because they're surrounded by water so they are forced to sell cheaply. Walter asked if there had been any known cases of domestic violence because of a mobile phone, but among them, they said no.
16 Nov 1 (Brenda Otika): Issues are charging and airtime.
16 Nov 2 (Walter): Issues include charging the battery, airtime costs, network problems (especially with MTN), and call costs.
16 Nov 2 (Rachel): Issues are batteries and options for charging, and MTN cuts their airtime, so "it's bad out here." Also, concerning the phones they received in 2005, they ask for market price by calling the Apac Farming District, but they do not know how to subscribe and get the SMS automatically, so the effectiveness is limited.
16 Nov 2 (Brenda Otika): The maintenance cost is high, charging the battery, network problems, and MTN keeps on cutting their money are some of the issues.
17 Nov 1 (Rachel): N/A
17 Nov 1 (Brenda Otika): Issues are charging and airtime.
17 Nov 2 (Rachel): The main issues are the costs such as charging, maintenance, and airtime. These can also cause domestic violence and can cause stress because sometimes people keep beeping you.
17 Nov 2 (Brenda Otika): Several issues include the maintenance (such as airtime and charging), domestic violence as a result of calls made during "awkward hours," and other people who beep a lot.

Appendix 3: CKW Interview Schedule

November 30, 2011:

- Masereka Ezra: Nyabirongo Central, Kisinga sub-county, Kasese district
- Masereka Scovia: Nyabirongo 1, Kisinga sub-county, Kasese district
- Muhindo Gabriel: Nyabirongo 2, Kisinga sub-county, Kasese district
- Baluka Susan: Nyabirongo 2, Kisinga sub-county, Kasese district
- Baluko Violet: Nyabirongo 2, Kisinga sub-county, Kasese district
- Amon Sivas: Nyabirongo 2, Kisinga sub-county, Kasese district
- Salomi Frikan: Musasa, Kyondo sub-county, Kasese district
- Gowdesea Marahi: Musasa, Kyondo sub-county, Kasese district
- Eliza Mugisa: Musasa, Kyondo sub-county, Kasese district
- Annet Muhindo: Musasa, Kyondo sub-county, Kasese district

10 Participants: 7 Females, 3 Males
Accompanying CKWS: 2 Males, 1 Female
Daily total participants (including CKWs): 13

December 1, 2011:

- Ngundi Johnson: Milhando Village, Kihungo Parish, Kyarumba sub-county, Kasese district
- Masakera Paulin: Milhando Village, Kihungo Parish, Kyarumba sub-county, Kasese district
- Bisogho Rebecca: Karwomera Village, Kyumba sub-county, Kasese district
- Bwambale Francis Kyahuliro: Rwembyo Village, Kisinga sub-county, Kasese district
- Mbusa Eric: Rwembyo Village, Kisinga sub-county, Kasese district

5 Participants: 2 Females, 3 Males
Accompanying CKWS: 2 Males
Daily total participants (including CKWs): 7

Final total of participants (including CKWs): 20

Gender breakdown of total participants (including CKWs): 10 Females, 10 Males

Appendix 4: CKW Interview Results

Date: 30 November 2011
Location: Nyabirongo Central, Kisinga sub-county, Kasese district
Interviewee: Masereka Ezra (Male) -Coffee
Interviewers: Rachel Piontak, Bakuku James, Bwambale Chris (conducted in Lukonjo with English translation)

- Chris: *Have you asked an agricultural or health question to the Community Knowledge Worker in your area?*

James: Yes.

- Chris: *What was the issue?*

James: He was asking about the management of coffee.

- Chris: *What was the CKW's response?*

James: He was advised that they should not dig holes when they are- when they are weeding, they should just slash.

- Chris: *Did the answer solve your problem/answer your question? Did it help?*

James: He says the answer he was given has really helped him grow his coffee.

- Chris: *Did you share this information with other farmers also?*

James: He says he has been sharing the information with the others, but farmers, those others, don't want to take up- they are reluctant to adapt. They become reluctant to adapt. Even when they have seen.

- Chris: *How many other farmers did you share the information with?*

James: Five farmers.

- Chris: *Do you plan to ask the CKW more questions in the future?*

James: That is yes.

- Chris: *Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: He said aside from the information he gets from her (indicating the female CKW also present at interview), he also went for some training.

- Chris: *Has your farming business improved since being a part of this project (spending less and producing more, or seller at a higher price, etc.)? (If yes) How so?*

James: He says yes and now his...[6]. He says that originally if he picked some coffee, say one- we measure coffee in terms of tins, but about 15 kilograms of fresh coffee that you would get- if you picked 15 kilograms of fresh coffee, originally he would get 3 of the clean coffee. But since he started this interaction, now, for every 15 kilograms of fresh coffee, he's able to get 5 kilograms of clean coffee. And the quality has improved.

- Chris: *Are there farmers in your area that do not use this service? Why do you think that they do not use it?*

James: He says that some farmers who have not used information services from the CKW. But others claim they are weak, they cannot, say, dig in the ditches. Some farmers who do not use the service may claim they are weak to, say, excavate these trenches.

- Rachel: *As in, the other farmers think that they are weak or that the answers would be weak?*

James: No, the question here is "Are there farmers in your area that do not use this service?" And he said yes. "Why do you think they do not use it?" Others claim to be weak. So.

- Chris: *Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: He has a son with a phone. For him he doesn't have, but the son has. He doesn't know, he doesn't know whether the phone has internet or not.

- Chris: *Are you able to use the phone anytime if you need it?*

James: Yes.

- Chris: *Do you contact the Community Knowledge worker with your phone? If so, do you call so that they can come to you or do you ask the question directly over the telephone?*

James: Yes, that he does call her (indicating the CKW).

- Chris: *What is the most important part about having a mobile phone for you?*

James: He says the most important thing about the phone is communication. Like, he's giving an example, he has a son, who stays in a district very far from here, so that anytime he wants to talk to him, he'll just call and, yeah.

[6] Garbled wording

- Chris: *How does it affect your daily life?*

James: To get to know what is happening on both sides.

- Chris: *How does it affect your work life?*

James: That in respect to farming, that in case that he has a problem, he doesn't have to walk to her place; he just uses the phone to call her.

- Chris: *Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: He says yes. The improved income has helped him solve some of his problems.

- Rachel: *Is that because you are able to produce more clean coffee and more selling?*

James: Yes. Knowing the information has increased his income. But he gets...[7]
He has a very small piece of land.

Date: 30 November 2011
Location: Nyabirongo 1, Kisinga sub-county, Kasese district
Interviewee: Masereka Scovia (Female) - Coffee
Interviewers: Rachel Piontak, Bakuku James, Bwambale Chris (conducted in Lukonjo with English translation)

- Chris: *Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: They have been asking.

- Chris: *If yes, what was the issue?*

James: It was about coffee management.

- Rachel: *What did they tell you?*

James: They said that when she's weeding, she should not go deep.

- *Did the answer solve your problem/answer your question? (Did it help?)*

James: That her...[8] that her yield is good.

- *Did you share this information with other farmers also?*

[7] Garbled wording
[8] Garbled wording

James: Yes.

- Chris: *How many other farmers did you share the information with?*

Chris: 3 people.

- Rachel: *Can I ask, are you part of a farming group?*

James: Yes, a member of the Nyanga cooperative.

- *James: Do you plan to ask the CKW more questions in the future?*

James: She wants to ask about how many trenches should be here, water trenches should be constructed in her garden.

- *James: Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: She does receive trainings from one of the, the leader, of the cooperative society which she belongs.

- *James: Has your farming business improved since being a part of this project? If so, how?*

James: That there has been a change in his, when he looks at his coffee- originally it was pale. The leaves were not very green- but since he started working, the plants have improved. The paleness has disappeared.

- *Chris: Are there farmers in your area that do not use this service? (If yes) Why do you think that they do not use it?*

Chris: Yeah, yeah, they are there. She's saying that some farmers don't mind using the services, because most of the farmers know when you talk to them, they say "Ah, are they going to bring for us things to do, things like hoes..."

- *Rachel: Oh, they expect something in return?*

Chris: Yeah, they expect something.

- *Chris: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

Chris: She's having a phone. Not internet.

James: She doesn't have internet.

- *James: Do you contact the Community Knowledge Worker with your phone?*

Chris: Yeah.

- *James: What is the most important part about having a mobile phone for you?*

James: Easy communication.

- Chris: *How does it affect your daily life?*

James: That she easily gets any information she wants to.

- Rachel: *Are you able to get market price information for your coffee?*

James: She says yes.

- *Chris: How does it affect your work life?*

James: Okay, that when she gets money, she's able to pay school fees.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

Scovia: Yes, yes, yes, yes.

James: That it improves her, that there is a change in her income, her improved income.

- *Rachel: Is it similar to the other farmer, where you can get more clean coffee?*

James: Almost. Apart from that, improved income. That's she constructing, constructing her new, her house, using the new income. She used money from here to buy the rafters for her house.

Date: 30 November 2011
Location: Nyabirongo 2, Kisinga sub-county, Kasese district
Interviewee: Muhindo Gabriel (Male) - Coffee, Bananas
Interviewers: Rachel Piontak (conducted in English)

- *Rachel: Have you asked an agricultural or health question to the Community Knowledge Worker in your area?*

Gabriel: Yeah.

- *Rachel: Many times?*

Gabriel: Sure.

- *Rachel: You don't have to say every time, but for one of them- what was the problem?*

Gabriel: The problem was my coffee plant.

- *Rachel: Was it something about the bean or the leaf?*

Gabriel: The leaf.

- *Rachel: And what was the response that they gave you?*

Gabriel: It was okay, it was okay.

- *Rachel:* What did they say?

Gabriel: I had to show them the problem on the leaves. Uh, they asked me whether I was an organic farmer or not, I said I'm an organic. Uh, they had to consult the headquarters of, where was it, Kampala. The communication came on the phone, they used the phone, yeah, they said you should do "this, this, this, and this." That's what I did.

James: They had advised him to make an organic pesticide.

Gabriel: Yeah, when I applied it, it worked.

- *Rachel: Was it a fertilizer or pesticide or what?*

Gabriel: No, no, it was pesticide.

- *Rachel: But an organic pesticide?*

Gabriel: Yeah, yeah.

- *Rachel: And it works?*

Gabriel: It worked very well.

- *Rachel: Did the answer solve your problem/answer your question? So did it help?*

Gabriel: Yes, I did. I did.

- *Rachel: Are you part of a farming group?*

Gabriel: Yes.

- *Rachel: Oh, okay. So you were able to share with them?*

Yeah, that's it.

- *Rachel: Do you know about how many farmers you were able to tell?*

Gabriel: Oh, the farmers? Uh, you see, most of the farmers here are within the corporate...[9].

- *Rachel: Oh, so they have very, very big farms?*

Gabriel: Yeah.

- *Rachel: Do they have other people to tell them information?*

Gabriel: That's right. We have about 72 farmers.

- *Rachel: In the farming group? Are members of that farming group also part of the corporate farming?*

Gabriel: Yes.

- *Rachel: But you're not? Or you also?*

Gabriel: I'm the chairman.
James: Yes.

- *Rachel:* So *do you plan to ask the CKW more questions in the future?*

Gabriel: Yeah!

- *Rachel: Other than the Community Knowledge Worker, where do you get farming advice and information?*

Gabriel: Uh, we get from NOGAM. Then CABS, that's Community Agro Business. We have Konjo Organics.

[9] Garbled wording

- *Rachel: Sorry?*

Gabriel: Konjo Organics.

- *Rachel: Oh okay, since you're an organic farmer.*

Gabriel: Yeah.

- *Rachel: That is good. And do they have agricultural extension workers that come?*

Gabriel: Yeah. And Nyagatonze Cooperative.

- *Rachel: Has your farming business improved since being a part of this project? If so, how?*

Gabriel: Yeah, yeah, it's improving. The leaf is improving. The production of the, the production, is a bit higher than it used to be.

- Rachel: Is it continuing to improve?

Gabriel: Yeah.

- *Rachel: Do you know an example, like- were you able to produce 15 kilos and now you can produce, I don't know, 20 or something?*

Gabriel: Yeah, there is a different. Yeah, you can tell. Now, formally, before we could get these extension workers come to us[10]... I used to get a hundred something kilograms, but today I'm over 200 kilograms per season.

Rachel: Wow, that is quite an improvement.

Gabriel: Yeah.

- *Rachel: Are there farmers that do not, use, that do not ask questions to the CKW? And if so, why do you think that they do not use it?*

Gabriel: Of course, we have some. We have some.

- *Rachel: Why do you think they don't use this service?*

[10] Garbled wording

Gabriel: They are not part of our cooperative, they are not with us. They haven't joined us yet, but when they join they will be interested also.

Chris: Some farmers, they haven't responded, because, you know, all farmers are not the same. There are some that are quick to pick these, and there are some who are not. So they don't pick at the same time. You know even in class there, they don't pick at the same time. Gabriel: No, no, no, they don't pick at the same time.

- *Rachel: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

Gabriel: My children have. For me I don't have.

- *Rachel: Okay, but you're able to use it if you need it?*

Gabriel: of course I approach them and ask questions and I get the reply.

- *Rachel: Do you contact the Community Knowledge Worker with your mobile phone?*

Gabriel: Me, I don't operate it, but they operate it. I ask and they operate it for me.

- *Rachel: What is the most important part about having access to a mobile phone for you?*

Gabriel: Quick communication.

- *Rachel: Do you find it helps even in your farmer group? People with mobile phones, to mobilize for meetings and things?*

Gabriel: Yeah.

- *Rachel: How have you seen a change in your farming from before having access to a mobile phone and after?*

Gabriel: there is a very big change. A very big change.

- *Rachel: How so? How is the change?*

Gabriel: There is a very big improvement with the yielding, yeah. Yeah.

- *Rachel: And do you think that is because you are getting more information or better information through the phone?*

Gabriel: Hmm, it's because I'm getting better information.

- *Rachel: Do you feel there has been a change in your life opportunities your livelihood because of receiving this information?*

Gabriel: *Yes! Yeah.*

- *Rachel: How? Again, how do you think it has it changed your opportunities?*

Gabriel: there is a, there is better understanding within the family members. Cooperation has improved.

- *Rachel: Is that a very good thing?*

Gabriel: Of course!

Date: 30 November 2011
Location: Nyabirongo 2, Kisinga sub-county, Kasese district
Interviewee: Baluka Susan (Female) - Bananas
Interviewers: Rachel Piontak, Bakuku James, Bwambale Chris (conducted in Lukonjo with English translation)

- *Chris: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes

- *Chris: If yes, what was the issue?*

James: She asked about management of bananas, about how many suckers remain past two.

- *Rachel: How many what?*

James: How many suckers, plants, should remain per stool. The whole of this is called the stool.

- Chris: *What did they tell you?*

James: They told her that every banana plant should have two young ones. To every parent plant should have two young ones. In fact, the whole thing is a mother, a daughter, and a grand.

- *Rachel: And a what?*

James: A grand. A mother, a daughter, and a grandparent- a grand to this. So this is the mother to this, and this is the mother to this, so the mother, daughter, grand. *(Indicating the three generations within the stool.)*

- *Rachel: Oh, okay! Very smart. And did the answer solve, did it help?*

Chris: She said yes.

- *Rachel: Okay, so there have been more bananas and better bananas since?*

James: The number may not have increased, but the quality- the size. Of course when you have very many, very many plants, you will have very many bunches but they will be small bunches. But then having few makes you get bigger.
Rachel: Yeah. Okay.

- *Chris: Did you share this information with other farmers also?*

Chris: She says yes, she has already shared this.

- *Chris: How many other farmers did you share the information with?*

James: She says around 8, people are staying around.

- *Rachel: Okay, are you part of a farmers group, like a cooperative?*

James: She says yes.

- *Rachel: Okay. Are most farmers part of a group? Many? Some?*

James: Some. Many farmers here. Especially because of NAADS. NAADS has farming groups. Even some other organisations.

- *Chris: Do you plan to ask the CKW more questions in the future?*

Chris: She says yes.

- *Chris: Has your farming business improved since being a part of this project?*

Chris: She says yes.

- *Rachel: Is there a more specific example of improvement perhaps?*

James: that she used to pick small berries, but now the berries have increased in size.

- *Rachel: For coffee?*

James: Yes, for coffee. The bananas have also come bigger in size.

- *Chris: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: That out there, there are some farmers that do not care. Some of them are lazy. They don't want to work. They hate work.

- *Chris: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: She has a phone. She is a modern woman. No internet, she has no internet.

- *Chris: Do you contact the Community Knowledge Worker with your phone?*

James: That she has always called them using her phone, the CKWs.

- *Rachel: Do you call them to come to ask the question or do you call with the question?*

James: That sometimes she may get a strange case and then she calls them to come and check.

- *James: What is the most important part about having a mobile phone for you?*

James: The most important thing about a phone is quick communication. She says you can talk to someone who is very far.
That one, the other, also gave us the same thing (referencing the previous interviewee with a similar response).

- *James: How does it affect your daily life?*

James: She says she has her children far from her. And when she's sick, she just calls and they'll bring drugs. So according to her it has helped her health status. She doesn't need to wait for the children to come. She calls and they bring.

- *Chris: How does it affect your work life?*

James: That she can easily communicate any strange effect on her coffee. If it has a strange disease, then she easily communicate it to the service providers. That it is sometimes, you see people, all people have not adapted the technology of mulching, so she says if she has, if she knows of someone who has some dry matter, say dry grass, and she wants to burn them, she can call, "don't burn those, I'm coming to carry them."

- *Chris: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: There is improvement; there is change because she now has enough food to eat. She's producing enough. She has always used the income from the crop to buy these young, these chickens. And paying school fees. Okay, that she has, she is able to buy pigs and goats. And she uses those goats to produce manure for the soil.

Date: 30 November 2011
Location: Nyabirongo 2, Kisinga sub-county, Kasese district
Interviewee: Baluko Violet (Female) - Coffee, Poultry
Interviewers: Rachel Piontak, Bakuku James, Bwambale Chris (conducted in Lukonjo with English translation)

- *Chris: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes

- *Chris: What was the issue?*

James: She asked about animal diseases. She wanted to find out what she should do if one of her pigs was sick.

- *Rachel: But the pig was not sick yet?*

James: That it was not yet sick yet. It's disaster preparedness. Then on another occasion, she asked about her chicken. Poultry. They had some disease. And she asked about what she could do. They told her to use this Nim tree and then she treated the disease on the poultry.

- *Rachel: Ah, okay. So it worked?*

James: It worked.

- *Rachel: Did the chicken have to eat the leaves?*

James: She pounds it, squeezes out the juice.

- *Chris: Did you share this information with other farmers also?*

Chris: She's saying that she shared the information with others and people around this part.

- *Rachel: And are you also part of a farming group?*

James: Yes.

- *Chris: How many other farmers did you share the information with?*

Chris: She says I don't know.

- *Chris: Other than the Community Knowledge Worker, where do you get farming advice and information?*

Chris: From the cooperative and NAADS.

Rachel: NAADS is everywhere.

Chris: NAADS, yeah.

- *Chris: Do you plan to ask the CKW more questions in the future?*

Chris: She says yes.

- *Chris: Has your farming business improved since being a part of this project?*

Chris: She says that before she was given such information, her coffee was, her yields were low. But since has got information, she has managed to put some terraces. And though it is not too much, but the little she has, she harvests and gets some good quality coffee.
James: So the coffee plants have improved.

- *James: How do you know?*

James: The yields have increased. That she also stopped cutting off the old ones.

- *Chris: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: Those that do not care. Ignorant, not ignorance, but the fact that they don't mind not minding. They get the information, but they don't mind about it.

- *Chris: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

Chris: She has a phone. She doesn't have internet.

- *Chris: Do you contact the Community Knowledge Worker with your phone?*

James: She has called.

- *Rachel: Called for the CKW to come or called to ask the question?*

James: That she calls these and other extension workers.

- *James: What is the most important part about having a mobile phone for you?*

James: Easy communication to extension workers.

- *James: How does it affect your life?*

James: She easily accesses solutions to her problems. She just calls and someone answers them.

- *James: How does it affect your work life?*

James: It's a quick control of diseases, animal diseases. Every time she has an animal disease, she calls.

- *Chris: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: Yes. Raised income, school fees. She can easily get money for controlling diseases. If someone falls sick, she easily gets money for sicknesses.

Date: 30 November 2011
Location: Nyabirongo 2, Kisinga sub-county, Kasese district
Interviewee: Amon Sivas (Male) - Coffee
Interviewers: Rachel Piontak, Bakuku James, Bwambale Chris (conducted in Lukonjo with English translation)

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes

- *James: What was the issue?*

James: Management of coffee. They advised him to prune. And weed.

- *Rachel: Oh, okay. And did it work?*

James: It worked.

- *Rachel: Did you share this information with other farmers also?*

James: He did. 3 to 4 (referring to the number of farmers he told).

- *Rachel: And is he part of the farmers' co-op as well?*

James: Yes., Uganda National Farmers' Association.

- *James: Do you plan to ask the CKW more questions in the future?*

James: He still has some questions to ask about the availability of pesticides.

- *James: Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: NAADS, CBF.

- *James: Has your farming business improved since being a part of this project? How?*

James: Yes. He has moved from 30 kilograms of coffee to 60.

- *Rachel: That he can sell, yeah? Or that he produces?*

James: Of course, all coffee is produced and sold.

- *Rachel: Yeah, but it's all sellable coffee, yeah?*

James: Yes.

- *James: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: Yes. Laziness, hatred for work.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: He says yes.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: He says she has just bought it, so not as much.

- *James: What is, or what do you think will be, the most important part about having a mobile phone for you?*

James: Communication.

- *Rachel: With family members?*

James: Fellow farmers. That's what he has said.

- *James: How do you think it will affect your life?*

James: Can easily know about trainings.

- *Rachel: And does he also access market prices through the phone?*

James: Yes, he says yes.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: Improved yields. School fees and he's begun saving.

- *Rachel: Does he save through mobile money, do you know?*

James: SACCO[11]. He has not used mobile money.

Date: 30 November 2011
Location: Musasa Kyondo sub-county, Kasese district
Interviewee: Gowdesea Marahi (Female) - Bananas

[11] Savings and Credit Cooperative Organisation

Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes.

- *James: What was the issue?*

James: So she asked about farm, I mean, banana management. Mulching, that she did in response. She was advised for mulching. That she should always leave three plants per stool. That was the response. Those were the issues.

- *Rachel: And did it solve the problem? Or rather, did it help?*

James: Yes. That yes.

- *James: Did you share this information with other farmers also?*

James: Yes. Four women.

- *Rachel: Okay, is she also part of a farming group?*

James: Okay, yes.

- *Rachel: Do you plan to ask the CKW more questions in the future?*

James: Yes

- *James: Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: CARITAS Kasese. NAADS.

- *Rachel: Has your farming business improved since being a part of this project? How?*

James: Yes.

- *Rachel: And how has it improved?*

James: I'm trying to, she was wondering, she was like saying- you see these people, farmers here, have a problem. When they see a visitor coming, sometimes they may lie. So she was like getting completely nothing, so I was trying to probe. Why are you getting completely

nothing? So she says she used to get very few bunches, like 3 bunches. So she used to get like 3 bunches per week, but she can now get 5 bunches.

- *Rachel: A week? From the bananas?*

James: Yeah. For sale. In addition to what she eats. She doesn't account for what she's eating.

- *Rachel: Does she sell other crops as well?*

James: She has coffee.

- *Rachel: Are there farmers that do not use this service?*

James: Okay, that most of them are using the information.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: She has a mobile phone.

- *Rachel: Oh yeah, can you access the internet?*

James: She doesn't know. No internet. She has no internet.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: She never calls.

- *Rachel: Because he comes around?*

James: Yes.

- *Rachel: What is the most important part about having a mobile phone for you?*

James: That she can easily communicate with her children at school, so communication. That at least she uses it to communicate with her children and her husband. Her husband is far.

- *Rachel: How does it affect your daily life?*

James: She says she feels good because of easy communication with her children.

- *Rachel: Are your children at secondary school? Are they far?*

James: They are in secondary school and far from home.

- *Rachel: And how does it affect your work life?*

James: It helps her to find out market prices. Sometimes they go to faraway markets and her children may want to know whether she has gone to the market.

- *Rachel: How does she find out the market price with the phone? Is there a number?*

James: She calls them; she calls any person- whoever would be in the market. Colleagues in the market.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: There is a change in her welfare. Communication, that she is updated. She is always updated with what happens out there. And always being in touch with her children, according to her, that is something very good. She gets money from her farming and then uses it to buy essential, and buys things like salt.

- *Rachel: Oh okay, so you have increased your income with the techniques?*

James: That she has.

Date: 30 November 2011
Location: Musasa Kyondo sub-county, Kasese district
Interviewee: Eliza Mugisa Farmer ID- UA60545 (Female) - Bananas
Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes. She has ever asked.

- *James: What was the issue?*

James: Management of banana diseases.

- *Rachel: Did the bananas already have a disease?*

James: Yes, she wanted to find out what to be done.

- *Rachel: And then what did they say?*

James: She was wondering whether she should cut down the whole plantation, but they told her no, just cut out proper management practices. And whatever plant is sick, you remove the sick one from it.

- *Rachel: Okay, and did it help?*

James: Yeah, it was okay. It helped her improve.

- *Rachel: Okay, good. Did you share this information with other farmers also?*

James: Six women.

- *Rachel: Okay, is also she part of a farming group?*

James: She's a member.

- *Rachel: Okay, is it an all-women farming group do you know? Or is it a mix?*

James: It's basically for women, but they have men members.

- *James: Do you plan to ask the CKW more questions in the future?*

James: She says she's still willing to ask more questions. About poultry management.

- *Rachel: Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: Just through the CKW.

- *James: Has your farming business improved since being a part of this project? How?*

James: Yes. Even other farmers are coming to learn from her. She has not harvested, but when you look at the condition and compare to others, there is an improvement. So she cannot talk of numbers.

- *James: Are there farmers that do not use this service?*

James: That there used to be some farmers that were negligent, but because of what she's doing, they are also coming up.

- *Rachel: Ah, to learn?*

James: To learn.

- *Rachel: Do you think that they will make them use the service in the future?*

James: That yes, they have been asking for him.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use?*

James: She has a mobile phone.

- *James: Can you access the internet?*

James: She has no internet.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: She has never called. They are always here.

- *Rachel: Is it because they're close to the main road that they're easily able to access the CKWs?*

James: They just come to them, not necessarily being near the road. Because this one, for example, is about 15 metres from here, but up the mountain. Because of the commitment, the commitment of the CKWs.

- *James: What is the most important part about having a mobile phone for you?*

James: That the most important thing about the phone is that it reduces transport costs. Instead of moving very far to communicate, to make a communication, you just call. So it reduces transport costs. That the phone can help you to get to know what you wouldn't have known otherwise, either someone can call you from a distance.

- *James: How does it affect your daily life?*

James: That the phone exposed her. She used to be isolated, but...that when the service providers are not there, she's contradicting herself up there, she does call. She calls the extension workers. She feels good because of the phone.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: That when she looks at her good bananas, she feels good. That she has even had an impact on other people, on other farmers that come here.

Date: 30 November 2011
Location: Musasa Kyondo sub-county, Kasese district
Interviewee: Annet Muhindo Farmer ID- UA57116 (Female)-Poultry
Interviewers: Rachel Piontak, Bakuku James (conducted in English translation with a few portions in Lukonjo)

- *Rachel: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

Annet: They have, yes.

- *Rachel: What was the issue?*

Annet: Okay, the question was about poultry keeping.

- *Rachel: Did the chickens have a disease?*

Annet: Yes.

- *Rachel: And then what did they say?*

Annet: They said that you should buy medicine.

- *Rachel: And were you able to find the medicine and use it?*

Annet: Yes.

- *Rachel: Did it help?*

Annet: It helped, yeah.

- *Rachel: Are your chickens healthy now?*

Annet: They are.

- *Rachel: Good, good. Did you share this information with other farmers also?*

Annet: Yes.

- *James: About how many?*

Annet: Very many.

- *Rachel: Okay, is also she part of a farming group?*

Annet: Yes.

- *Rachel: Okay, is it all women? Or are there men too?*

Annet: Both.

- *James: Do you plan to ask the CKW more questions in the future?*

Annet: Yes! (With enthusiasm)

- *Rachel: Other than the Community Knowledge Worker, where do you get farming advice and information?*

Annet: Other extension workers, there is the coordinator- NAAD's coordinator.

- *Rachel: And does your farming group have trainings sometimes?*

Annet: Yes.

- *James: Has your farming business improved since being a part of this information? How?*

Annet: Okay, it is improving. They're laying eggs.

- *Rachel: Okay, are they laying more eggs than before?*

Annet: Yes.

- *Rachel: Okay, can you guess about how many, or what the change has been, comparing the number of eggs they were laying before and now? (translated by James)*

James: It used to be about 100, and now she delivers about 200.

- *Rachel: A week?*

James: A day.

- *Rachel: Oh! Do you have many chickens?*

Annet: Yes, others are behind and some are here.

- *James: Are there farmers that do not use this service?*

Annet: They are there.

- *Rachel: And why do you think that is? Why do you think they don't use it?*

Annet: Okay, others are not informed and others are informed. Because those that are informed have already joined.

- *Rachel: And some just don't know?*

Annet: Yes.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use?*

Annet: I have.

- *James: Does it have the internet?*

Annet: No.

- *James: Do you contact the Community Knowledge Worker with your phone?*

Annet: Yes, I have.

- *Rachel: Have you called him to ask questions or asked him to come so you can ask questions at your home?*

James: She asks them directly.

- *James: What is it important part about to have a mobile phone for you?*

Annet: It is important because I'm communicating with other friends, other organisations, my husband...

- *Rachel: When he is away?*

Annet: Yes.

James: He stays in Kasese, so she uses it to communicate.

- *James: How does it affect your daily life?*

Annet: It helped me because I do my businesses on that phone.

- *Rachel: In order to sell the eggs?*

Annet: Yes.

- *Rachel: And are you able to get market prices as well?*

Annet: Market prices are still low.

- *Rachel: For the eggs?*

Annet: Yes.

- *Rachel: But you can know them easily?*

Annet: Yeah.

- *Rachel: So you can find seller with it?*

Annet: Yeah.

- *Rachel: That's good. Do you feel there has been a change in your welfare or life opportunities as a result of having a mobile phone and having accessing this information? How?*

Annet: Okay, there is a change because the previous time where we had no phones, we had no communications, we had only radios.

James: Now they access information very widely!

Annet: Yes.

- *Rachel: And has it helped you improve income and being able to improve your farming, or in your case with poultry, even more? Having the access to information?*

Annet: Yes, the income has increased.

Date: 1 December 2011
Location: Milhando Village, Kihungo Parish, Kyarumba sub-county, Kasese district
Interviewee: Ngundi Johnson (Male): Coffee, Vanilla

Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)
*Gerald is the area CKW and accompanied us to interviews 11-13

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: He has ever asked him. He asked about pests, coffee pests. Control, pest control.

- *Rachel: What was the answer?*

James: That he gave, he gave, the other one told him about the organic pesticide using pepper. The organic pesticide by use of pesticide, ash, animal urine. Now, that he has been helped.

- *Rachel: Okay, so the pests on the coffee are better?*

James: That the pests have reduced. He has tried to control them; the advice helped him to control the pests.

- *James: Did you share this information with other farmers also?*

James: He has talked to, he has shared information with farmers.

- *Rachel: And is he part of the farmers' co-op as well?*

James: Yes, a farmers group called Bukonjo Joint.

- *James: Do you plan to ask the CKW more questions in the future?*

James: Yes, he says yes.

- *James: Other than the Community Knowledge Worker, where do you get farming advice and information?*

James: Bukonjo Joint extension staff.

- *James: Has your farming business improved since being a part of this project? How?*

James: He says his farming business has improved.

- *Rachel: He said 'for example?'*

James: Around 45 kilograms. He used to have around 45 kilograms of coffee, but how he has more than 1500.

- *Rachel: Per season?*

James: Per season.

- *James: What about vanilla?*

James: With the vanilla, he used to invest 40 kilograms, but now has 150.

- *Rachel: And this is because of farming advice through CKW or just farming advice in general, does he think?*

James: It's the contribution of both.

- *Rachel: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: He says yes. Some of the farmers are reached, but they do not practice because they are, they have not developed the vision. So they are not visionary and therefore they have not worked hard, they are just there.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: Yes. No internet.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: He has always asked by phone.

- *Rachel: Oh, okay. For them to come or just to ask over the phone?*

James: Both, depending on the magnitude of the problem.

- *James: What is the most important part about having a mobile phone for you?*

James: That he gets, he's proud of the phone because it helps him get in touch with the CKW from a distance.

- *James: How does it affect your life?*

James: That because of the phone, he's able to solve his problems that would call for someone who's far. Instead of travelling, he just calls.

- *James: How does it affect your work life?*

James: That it exposes him; it makes him learn where to get inputs from. He's able to access good inputs because he uses the phone to help him link up with others who can help him get in touch with the input advice. At the same time, prices of his produce.

- *Rachel: So you can use the phone to access the prices?*

James: Yes.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: He can buy food, he gets improved income. In fact, it's his improved income that makes him able to buy his food, but he says he still needs more- more information, more trainings. School fees, he's now able to pay school fees. You can even see the bricks, he's planning to construct a bigger house.

- *Rachel: And were you able to purchase the bricks because of the better income?*

James: Yes.

Date: 1 December 2011
Location: Milhando Village, Kihungo Parish, Kyarumba sub-county, Kasese district
Interviewee: Masakera Paulin (Male): Coffee
Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)
*Gerald is the area CKW and accompanied us to interviews 11-13

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes. He asked about animal diseases.

- *Rachel: Which animal?*

James: Pigs.

- *Rachel: And what did they say?*

James: The animal, that they have some animal fever. He advised that every time the animal is sick, he should consult his vet.

- *Rachel: Oh, okay. And did that help?*

James: It helped. They also talked to him about soil and water conservation. That is the reason why you saw those ditches.

- *James: Did you share this information with other farmers also?*

James: That he has trained, he himself has shared the information with 15 other farmers.

- *James: And are you a member of a farmers' co-op or group as well?*

James: Yes, he's part of a group.

- *James: Which group is that?*

James: Manero Prisant[12].

- *James: Do you plan to ask the CKW more questions in the future?*

James: He plans to go back to him for more questions.

- *Rachel: The CKW? And it's Gerald, yeah? Is the CKW?*

James: Yes.

- *James: Apart from Gerald, where do you get farming advice and information?*

James: Bukonjo Joint extension workers.

- *James: Has your farming business improved since being a part of this project? How?*

James: He says the farming business has improved. That he says he used to harvest only 40 kilograms, but he has now moved up 200 kilograms.

- *Rachel: Of?*

James: Coffee. So that's how his yield has improved.

- *Rachel: How many seasons did it take to improve that much?*

James: Two seasons.

[12] Spelling uncertain

- *James: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: He says some of the farmers around have adapted, not all, but at least most of them are trying to convert.[13]

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: He has an internet phone. He doesn't use {in reference to the internet}.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: That he has always called the CKW either to question him or to call him to come to his place for anything.

- *James: What is the most important part about having a mobile phone for you?*

James: Easy communication, easy communication.

- *James: How do you think it affects your life?*

James: He's very happy about the phone because he gets information easily.

- *James: How does it affect your work life?*

James: He says it has helped him as far as farming is concerned. And he is giving an example that, for example, if he did not have a phone, we would not have seen him. But because you were there and he was not there, he was called. That some people want to train on his farm, so when they come there, they will always call him and he goes there to train them.
That sometimes he may call the extension worker, the CKW, to ask him about the markets using his phone.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: Okay, income, improved income. He's comfortably paying school fees, doesn't need to look for where to borrow money from, he's feeding very well, he's able to buy enough food, he's planning very well for his family now.

Date: 1 December 2011

[13] Garbled wording

Location: Karwomera Village, Kyumba sub-county, Kasese district
Interviewee: Bisogho Rebecca (Female- Gerald's wife): Bananas
Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)
*Gerald is the area CKW and accompanied us to interviews 11-13

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes. That she asked about kitchen gardens.

- *Rachel: What is a kitchen garden?*

James: Like those ones (pointing to small garden near the house).

- *Rachel: Oh, okay. Does it mean they are smaller?*

James: Yes, kitchen gardens are small for the immediate need of the kitchen. If you want, say, fruit, an eggplant, you just go and take one. Just vegetables. They taught her how to prepare the beddings, how to incorporate manure into the soil, how to mix up the soil very well. Also, she also asked about water trenches for water conservation.
And about trenches, they don't- the soil should not always be pushed down, some should be pushed down and some should be pushed up and then you can plant some crops on those trenches.

- *James: Did you share this information with other farmers also?*

James: That she has shared to others, she's a trainer to others. She's a trainer now to others. She has gone to get a list of the farmers she has trained.
She has shared with almost…36 people (indicating list). She trained these ones on 7th October. These ones of the 15th November (pointing to list).
Trained just using the information that...[14] Yeah, sharing the information she has. And then she says she was demonstrating to them.

- *James: Do you plan to ask the CKW more questions in the future?*

James: So she says she will continue asking the CKW.

- *Rachel: Okay, sorry- and is she part of a farmers group as well?*

James: Yes. Most of the farmers are.

[14] Garbled wording

Rachel: Yeah, I think all we have asked.

- *James: Apart from the CKW, where do you get farming advice and information?*

James: Cartias Kasese.

- *James: Has your farming business improved since being a part of this project? How?*

James: She says she has just joined, she has just started. So there is no yield, she has just started.

- *Rachel: How recently?*

James: Three months.

- *Rachel: Okay, so there are no number differences yet?*

James: No, but she's looking at a good future, she says.

- *James: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: That some farmers were reluctant to adapt, but because of, this one also, tried through demonstration, some are picking up.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use? Can you access the internet from your phone?*

James: She has a phone. No internet.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: Okay, she doesn't need to call the Community Knowledge Worker because the Knowledge Worker is her husband. This one is her husband (indicating Gerald). They are together, so the other one's there, they are always together.

- *James: What is the most important part about having a mobile phone for you?*

James: Communication.

- *Rachel: With people for business or family?*

James: Business and mobilising people.

- *James: How do you think it affects your life?*

James: It has simplified her life. That without it, she feels…for example, she has just been called to go to Bwere[15] using the phone.

- *James: How does it affect your work life?*

James: That it simplifies her work, she feels that it simplifies her work. Even her working, that it simplifies her working. That she helps people to construct these gardens, so sometimes they call her by phone.

- *Rachel: The kitchen gardens?*

James: Yes.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: Improved welfare, that she can easily get fruits, I mean, vegetables, greens from her garden, and so she has improved her nutrition. She only has problems with constructions of trenches, she lacks spades.

- *Rachel: So sometimes she knows the knowledge and information, but lacks the equipment to do it?*

James: Yes.

Date: 1 December 2011
Location: Rwembyo Village, Kisinga sub-county, Kasese district
Interviewee: Bwambale Francis Kyahuliro (Female): Poultry
Interviewers: Rachel Piontak, Bakuku James (conducted in Lukonjo with English translation)
*Geofrey is the area CKW and accompanied us to interviews 14 and 15

- *James: Have you asked an agricultural question to the Community Knowledge Worker in your area?*

James: Yes.

- *James: What was the issue?*

[15] Spelling uncertain

James: That he asked about poultry.

- *Rachel: Was there a disease?*

James: Diseases.

- *Rachel: What did they say?*

James: They told him to make some, some herbal medicine for the birds with pepper, siso... a mixture of pepper, siso, and ash. And of course water.

- *Rachel: Was it effective?*

James: It helped him.

- *Rachel: And the poultry is okay now?*

James: Yes.

- *James: Did you share this information with other farmers also?*

James: He has told four people, shared to four people.

- *Rachel: And are you part of a farmers group?*

James: Okay, yes.

- *James: Do you plan to ask the CKW more questions in the future?*

James: He will ask so many things, not only about poultry.

- *James: Apart from the CKW, where do you get farming advice and information?*

James: Some, Nyagatonze Cooperative and then some agriculture extension workers, then some government extension workers.

- *James: Has your farming business improved since being a part of this project? How?*

James: Okay. He has a story, that he would have benefited much, he would have improved his farming business, but the problem is that even when they advise him, he lacks inputs.

- *Rachel: Inputs how?*

James: Like, he was giving an example that he may be able to treat the birds and they become all right, but because these birds feed from far and he doesn't have, has never, has not have inputs to construct a house for them, then they may be eaten up by wild animals. But practically, he says there is some. That would be improvement according to the advice given.

- *James: Are there farmers in your area that do not use this service? If so, why do you think that they do not use it?*

James: Yes, he says yes. They, they don't, they are not bothered. They feel unbothered or discouraged by the fact that they don't have inputs.

- *James: Do you own a mobile phone or does someone in your family own a mobile phone that you can use?*

James: He has a mobile phone.

- *Rachel: Does he have internet?*

James: No.

- *James: Do you contact the Community Knowledge Worker with your phone?*

James: That he calls, he invites him either to come or to answer the question from whoever depending on the margin of the problem.

- *James: What is the most important part about having a mobile phone for you?*

James: Reduces transport costs.

- *James: How do you think it affects your life?*

James: He feels he can't live without it; it has improved his lifestyle, his daily lifestyle.

- *James: How does it affect your work life?*

James: Helps him to get in touch with extension workers; that he participates in the cotton business, so sometimes he talks to customers and people, to clients, using the phone.

- *James: Do you feel there has been a change in your welfare or life opportunities as a result of receiving this information? How?*

James: Accesses food, educating children.

- *Rachel: For school fees?*

James: For school fees and buying them scholastic materials.

Date: 1 December 2011
Location: Rwembyo Village, Kisinga sub-county, Kasese district
Interviewee: Mbusa Eric (Male): Banana
Interviewers: Rachel Piontak, Bakuku James, Mbusa Geofrey (conducted in Lukonjo with English translation)
*Mbusa Geofrey is the area CKW and accompanied us to interviews 14 and 15

- *Rachel: Have you asked an agricultural question to the Community Knowledge Worker in your area? To Geofrey?*

Eric: Yes.

- *Rachel: When you asked these questions, what was the problem or the issue with these crops? Or the animals or anything?*

James: That he does ask him, and one of the issues he remembers having asked him about was market. Or certain produce, certain agriculture produce.

- *Rachel: Like the prices?*

James: Market prices, and then some diseases, some diseases for crops.

- *Rachel: Which crops?*

James: That he asked about- you see, it is better if she interacts with you directly, it's better that she gets firsthand information. I'm trying to encourage him, he can speak some English. I'm trying to encourage him to talk to you directly, so that you don't get second hand information, just from him. So he was saying here, he has asked about banana diseases so when you say "which crop" he was talking about bananas.

- *Rachel: And when you asked the question, what was the response? What did the CKW tell you?*

Eric: When I asked about the market, he went to the internet.

- *James: He used his phone?*

Eric: Yeah, so he used it to show me some region. With maize, these are the prices. And for bacteria wilt, disease affecting these bananas, he didn't tell me exactly what I can do.

- *James: But apart from, did he tell you about cutting the bad ones?*

Eric: Yes, cutting them.

James: BBW's a common disease here, Banana Bacteria Wilt. It has no cure. The only cure is destroying the crop, the plant.

- *Rachel: And so they told you to destroy the plant?*

Eric: Yes.

- *Rachel: And did that help, did the BBW go away?*

Eric: It's doing so.

- *Rachel: Okay. So it's helping some?*

Eric: Yes. And cotton, we have, with this area, we have something destroying cereal crops. I asked him what should we do about this, so, he said they have not discovered anything to deal with it.

- *James: What disease is that?*
- *Rachel: Oh, it is a weed?*

Eric: Yeah, it's a weed. But when you have that weed in your garden, you can't plant there maize, you can't plant millet, you can't plant sorghum, or rice.

James: Its roots will penetrate the roots of the crop. So whatever the crop plants gets from the soil, this one takes it off and the crop plant will not do well.

- *Rachel: And there is no cure?*

James: No, it is only controlling it to away that weed, so we advocate for crop rotation. It attacks cereals- maize, rice, wheat…

- *Rachel: Cereals?*

James: Yes, cereal crops. So the only cure is crop rotation. You have about three seasons without planting the maize, but then some seeds will still remain in the soil.

- *Rachel: I see, and did you share this information you received with other farmers as well?*

Eric: Yes.

- *Rachel: About how many farmers?*

Eric: Two.

- *Rachel: And are you part of a farming group?*

Eric: Yes.

- *James: Has your farming business improved or increased since you have been getting information from the CKW?*

Eric: Yes, the farming is now increasing.

- *Rachel: How so, like how has it improved or gotten better?*

Eric: Like, in this area, we usually plant cotton and maize and from the information we get from him, we are improving.

- *Rachel: Okay. Do you know how much you could yield before this information maybe and how much you yield now? Is there a difference?*

Eric: But with us, because we have just entered this group…

James: In fact, they have not had- this is the first cotton season.

Eric: But we are having promising information for the cotton crops.

- *Rachel: Are there farmers in your area that do not use this service?*

Eric: They are there, but you know, in the community…people, you have different people.

- *Rachel: Why do you think that some people do not use this service?*

Eric: Others, they…see, some people, others they can be ignorant- careless. Others, they become stubborn.

- *Rachel: Do you own a mobile phone or does someone in your family own a mobile phone that you can use?*

Eric: Yeah.

- *Rachel: Can you access the internet?*

James: He doesn't access.

- *Rachel: Do you call the Community Knowledge Worker from your mobile phone? Have you done that?*

Eric: Some information about the crops.

Geofrey: And with this one, it takes us some advantage because he is next to me, he even calls by mouth and then he hears.

- *Rachel: So you do not call Geofrey very often, because you are neighbours?*

Eric: Yeah.

- *Rachel: What is the most important part about having a mobile phone for you?*

Eric: Communication, if he wants to someone, he just communicates and he will do his activities in good time. If he has something he wants to know, he easily gets the answer by calling without necessary going there.

- *Rachel: How does it affect your daily life?*

James: Feels good.

- *Rachel: How does it affect your work life? So, with farming?*

James: It helps him improve the farming system, because he gets the information…[16]

- *Rachel: And other, that reminded me, other than CKW, where do you get farming information and advice?*

Eric: Me, I was a trained site coordinator in cotton and maize.

[16] Garbled wording

James: He knows some basics. He's an extension of his own.

- *Rachel: So you already know a lot on your own?*

Eric: Yes.

- *James: Okay, you know some agriculture. But then apart from you and him, who else has ever come here to tell you about agriculture?*

Eric: We have the CDO (Cotton Development Organisation) coordinator, extension worker, coming soon Nyagatonze Cooperative; they usual came to tell us about cotton growing and maize growing. NAADS, sometimes.

- *Rachel: Do you feel there has been a change in your livelihood, life opportunities, or welfare as a result of receiving this information?*

Eric: The livelihood has just achieved at least…

- *James: It is changing slowly by slowly?*

Eric: Yes.

- *James: Now how can we know, what are you doing now?*

James: School fees, he is beginning to change children from poor schools to better ones.

- *Rachel: Okay, I have a question. Since the CKW is new in the area and the cotton, the harvest season hasn't come yet, how, I guess, I'm looking for a deeper explanation for how the livelihood has changed because it seems like you have improved income in order to pay for school fees and things, but do you see the question? But where is it coming from if it's not the harvest season?*

James: But, you see, this cotton is just following some crop which was on, which was already on by the time the CKW project began.

- *Rachel: Right, but it doesn't have anything to do with the CKW?*

No, it has something to do. You see like, when we are growing crops, there is a planting. So if I came and advised you, even after you have planted wrongly, but I then told you to weed- as long as the crop is still in the ground, you can improve slightly.

- *Rachel: So that did happen?*

James: Yes, I think that's what they're talking about. In fact, the CKW project found some crop in the already growing and so they started from there. And now, whichever farmer took advice realised a better yield than the previous ones, so it was like, "Supposing I had started the crop with this project, it would have been even better!"

Rachel: Okay, right. I just didn't know that you had receiving advice and information while you were still growing the last crop.

Geofrey: And even those ones that took the information that had been provided, at least they accessed a good market.

James: Like, he talked about markets. So for example, the maize got ready. By the time the project was on, the maize had not been harvested. So the lot that was harvested was not sold anyhow, it was sold basing on the advice.

Geofrey: And after getting the information, seeing that we'd been seeing the markets within the region, within the other counties, we had to improve on our agriculture. We have to come from one acre to about three acres.

James: You see originally people just get their maize and they just sell them anyhow. But now today, the CKWS come to the farmers. They tell the farmers the price where he's located, the price in the nearby trading centre, the price in Kasese- so that now the farmer can think for himself. He's no longer going to be cheated. Because when you come to him, he'll say "No, that price is not here. The price here is this. Now that you are buying and taking your crop in Kasese, this is the price in Kasese. Now can we bargain. Let us share the profit. Don't just over cheat me. If a kilo is 200, no, and it's 700 in Kasese- can you give me 300? Or 400, so that I leave you with 300?"