FINANCIAL INCLUSION: BANKING ON MOBILE PHONES?

A Case-Study of Financial Inclusion and Mobile Banking in Rwanda

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Abstract

Mobile banking has become an eminent component in the debate on financial inclusion. Many developing countries have low bank penetration levels, which makes it more challenging for poor people – who usually live in rural and/or remote areas – to access safe and affordable financial services. This explorative study wants to contribute to the global pool of demand-side data in mobile banking. First, a client profile analysis is conducted on the m-banking users, the m-banking non-users and the general unbanked Rwandan population. Subsequently, it is researched how mobile banking can affect financial inclusion. The results indicate that clients highly value the time savings and safety of their money, of the m-banking system. The m-banking service had increased the total number of financial access points, that significantly benefitted rural dwellers, and which has a positive effect on financial inclusion. The m-banking service did however negatively affect the propensity to save, and according to focus group participants, also negatively affected the loan group cohesion and on-time repayments. However, the effect of the m-banking service on achieving greater financial inclusion has so far remained additive. Nonetheless, the fact that a micro-finance bank is launching the m-banking service gives it more potential to become 'transformational' in the future, thereby extending financial services to segments of the population who could never be reached before by the traditional brick and mortar branches.

Keywords

[Branchless Banking, Mobile Banking, Financial Inclusion, Unbanked, Microfinance, Rwanda]

Disclaimer

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Figure 1. Map of Rwanda

SOURCE: GOVERNMENT OF RWANDA[1]

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[1] http://commons.wikimedia.org/wiki/File:Rwanda_Districts_Map.jpg

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Acronyms

ATM	Automated Teller Machine
BCR	Banque Commerciale du Rwanda
BK	Bank Of Kigali
BNR	National Bank of Rwanda
BPR	Banque Populaire du Rwanda
CBL	Community Banking Loan
CGAP	Consultative Group to Assist the Poor
EBU	Entrepreneurial Business Unit
EDPRS	Poverty Reduction and Economic Development Strategies
EUR	Euro
FGD	Focus Group Discussion
FSDP	Financial Sector Development Program
Global Findex	Global Financial Inclusion Database
GoR	Government of Rwanda
ICT	Information and Communication Technology
KCB	Kenya Commercial Bank
M-banking	Mobile Banking
MFI	Microfinance Institution
MINECOFIN	Ministry of Finance and Economic Planning – Republic of Rwanda
MNO	Mobile Network Operator
MTN	Mobile Telephone Network
NGO	Non-Governmental Organisation
OI	Opportunity International
PAR	Portfolio At Risk
RO	Relationship Officer (formerly known as Loan Officer)
RWF	Rwandan Franc
SACCO	Savings And Credit Co-operative
SIM	Subscriber Identity Module
SMS	Short Message Service
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
TJAS	Triple Jump Advisory Services
UOB	Urwego Opportunity Bank
Urwego	Urwego Community Banking
WDI	World Development Indicators (World Bank)

1. Introduction

1.1 Background and Problem Statement

Mobile money and branchless banking have been an emerging area of research these last years. After the introduction of mobile money turned out to be a success in Kenya, the Philippines and South Africa, many other developing countries in Sub-Sahara Africa (SSA) have been introduced to this technology, although to date to much lesser effect (Mas and Radcliffe, 2010; Heyer and Mas, 2011).

During this development, branchless banking became an eminent component in the debate on financial inclusion (Dermish et al., 2012). Financial inclusion can be described as 'an absence of price or nonprice barriers in the use of financial services' (Demirgüç-Kunt, Beck and Honohan, 2008, p.22). Many developing countries have low bank penetration levels, which makes it more challenging for poor people – who usually live in rural and/or remote areas – to access safe and affordable financial services. It is estimated that more than 2.5 billion people worldwide, who especially live in the lower to middle income countries, do not have an account at a formal financial institution (Pénicaud and Katakam, 2013). Yet to escape the poverty cycle these people are in need of financial services that enable them to make the necessary investments and take-up insurances to safeguard their assets (Jack and Suri, 2011).

Branchless banking models make use of new technology-enabled distribution channels to introduce banking services into the hands of clients by laying down an alternative banking infrastructure of non-bank agents in the rural and remote areas where many impoverished people reside. These models unite the services from banks, mobile network operators (MNOs) and retail players (Dermish et al., 2012). Mobile banking (m-banking) is a form of branchless banking that allows people to access banking services and conduct financial transactions through a mobile phone. This type of technology has great potential to reach and serve the poor, since out of the 2.5 unbanked billion people living worldwide, one billion already have access to a mobile phone (Pénicaud and Katakam, 2013).

By leveraging on this technological improvement, banks have been able to decrease their fixed set-up and operational costs in their delivery of financial services. With m-banking, the required investments in physical service points like bank branches and automated teller machines (ATMs) are no longer necessary . As a result of these lower costs, banks are now able to expand their customer base beyond their traditional bricks and mortar banking infrastructure and make credit available to the poor and rural dwellers. This can have a positive effect on the number of people that are being financially included (Ivatury and Mas, 2008; Jack and Suri, 2011).

Except from being able to financially serve new customers, m-banking also renders it possible for banks to provide their existing clients with more and better services by offering them new and better products that target their unmet needs. This new mobile delivery model facilitates financial transactions since it can prevent the need to travel long distances to branches as well as standing in long waiting lines to be assisted, thereby saving people valuable time and money (Mas and Kumar, 2008; McKay and Pickens, 2010). Still, m-banking does require a customer to have access to a mobile phone and a mobile network service (Porteous, 2006). Today, people in developing countries are also becoming more financially and mobile adept. In these countries, it is not uncustomary for users to

swap SIM cards from one mobile network provider to another to ensure the best rates or lowest commission when making a mobile banking transaction (Abosi, s.a).

The 2011 Global Financial Inclusion Database[2] (Global Findex) has demonstrated that there are differences in the use of financial services between high-income and low-income economies, but also use differs across individual characteristics like gender, wealth and age. Especially in developing countries it can be observed how different individual characteristics can affect the access to and use of formal accounts (Demirgüç-Kunt and Klapper, 2012a). Does a certain client profile exist that is more inclined to use mobile banking? There is limited literature that studies the demographic characteristics of mobile banking users and non-users.

There has been extensive research on branchless banking. Meanwhile, there is still a shortage of research that attempts to understand the impact of this technological advancement from the view of the (potential) users. This thesis wants to contribute to the global pool of demand-side data in mobile banking. At the same time it should be noted that the customer-centric viewpoint will presumably differ across countries and deployments (Dermish et al., 2012). Within the mobile banking theme, Rwanda has not yet received much attention throughout the literature. Peer-reviewed articles tend to be more focused on countries like Kenya, the Philippines and South-Africa, where mobile money has been successful. In addition, the connection between the mobile banking field and microfinance institutions (MFIs) has not been well-researched (Diniz, Albuquerque and Cernev, 2011).

1.2 Research Objective and Questions

The main objective of this explorative study is to research how mobile banking has affected financial inclusion, in terms of access and usage of financial services, with the distinction between rural and urban areas.

In order to investigate these effects and differences, it is essential to make the concept of financial inclusion measurable. In the literature review it is discussed that financial inclusion is made up out of two main components: 'financial access' and 'financial usage', with a set of proxy indicators for each of them. In this context, the existing barriers to financial access and usage and in particular the barriers to m-banking will be discussed as well.

The following sub-questions will be answered: (1) Is there a difference between the socio-demographic characteristics of m-banking and non m-banking clients, and how does this compare to the general (financially excluded) Rwandan population? (2) Do clients acknowledge the presumed features of convenience, efficiency and security of m-banking? (3) Do urban and rural m-banking users assess the benefits, costs and barriers of Urwego Opportunity Banks' (UOB) mHose service significantly different? (4) Are there any clear negative effects on client-level outcomes of the introduction of UOB's m-banking product?

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[2] The Global Findex database includes indicators measuring how adults save, borrow, make payments, and manage risk. The data is collected in 148 countries and comprises of more than 150,000 randomly selected survey responses.

1.3 Outline

The remainder of this thesis consists of seven chapters. Chapter two reviews the existing literature about financial inclusion and branchless and specifically mobile banking. In chapter three the research methodology and methods of data collection of the study are presented. Chapter four will provide related background information of the research area, the microfinance bank and their mobile banking channel named mHose[3]. Next, the results of the client profile analysis are given in chapter five, whereas chapter six will present the findings from the qualitative and quantitative research. Chapter seven will focus on the discussion and limitations of the study, while the final chapter will provide the conclusions and recommendations.

[3] mHose means 'everywhere' in the local Rwandan language Kinyarwanda

2. Literature Review

This chapter will first review the literature on the concept of financial inclusion and subsequently on branchless banking, and in particular mobile banking. This will provide the basis for the quantitative research in this thesis, investigating if the financial inequality gap between urban and rural areas will mean that urban and rural mobile banking users are significantly different from each other in their assessment of the benefits and costs of UOB's mobile banking product. Finally, this chapter will give and discuss the analytical framework.

2.1 Financial inclusion

The 2011 Global Findex reveals that 50 per cent of all adults[4] worldwide have an individual or joint account at a formal financial institution[5] and thus can be categorized as 'banked', leaving an equal share to be 'unbanked' (Demirgüç-Kunt and Klapper, 2012a). According to Medhi, Ratan and Toyama (2009, p.1), the unbanked are the 'people without formal bank accounts who operate in a cash economy; they are limited in their ability to take out loans, maintain savings, or make remote payments'. In the literature on financial inclusion, a distinction can be made between the banked and the formally served population. Even though the literature differs in what constitutes as a formal financial institution, the formally served can broadly be defined as those who have an account at either a commercial bank, or a non-bank formal financial channel such as an MFI, a post office, a non-governmental organization (NGO), the government, a Savings And Credit Co-operative (SACCOs), an insurance company, Western Union, mobile money service providers and money transfer service providers. However, this thesis will use the more narrow definition, and defines financial access as having a formal bank account.

The 2011 Global Findex data also shows that the level of bank account penetration varies significantly between high-income and low-income countries: respectively 89 per cent of the adults in high-income countries and only 24 per cent of the adults in developing countries have a formal account. But besides cross-country variation, account penetration also varies across individuals within a country. Individual characteristics like income level or gender (e.g. women are 20 per cent less likely to have an account than their male counterparts) can also have an effect on the level of financial inclusion (Demirgüç-Kunt and Klapper, 2012a; 2013).

When looking at Africa specifically, a financial infrastructure gap can be detected. In Sub-Saharan Africa (SSA) only 24 per cent of the adults mentioned having an account at a formal financial institution. This low percentage is not surprising considering the low number of bank branches and ATMs within the region. Informal financing arrangements play a big role instead (Beck, Demirgüç-Kunt and Peria, 2008; Demirgüç-Kunt and Klapper, 2012b). Collins et al. (2010) reveal in their book *Portfolios of the Poor* that low-income people lead very active and complex financial lives, thereby handling multiple (formal

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[4] An adult is: age 15 or above.

[5] The Global Findex data defines formal financial institutions as: a bank, credit union, cooperative, post office or microfinance institution.

and/or informal) financial tools and arrangements to manage their finances on a daily basis. The poor face erratic sources of income and occasionally a disruptive crisis, which increases the necessity of finance in order to maintain a living, plan investments and insure themselves against risks (Dermish et al., 2012).

Every country has a financial system that is comprised of financial institutions, financial markets and financial infrastructure. This system offers financial services to individuals and firms (World Bank, 2014). Demirgüç-Kunt and Klapper (2013, p.280) then define financial inclusion as 'the use of formal financial services' by these individuals and firms. However, there are many definitions of financial inclusion, and defining the term in absolute terms is challenging. In this thesis, the definition of the Reserve Bank of India will be used: 'financial inclusion is the process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular at an affordable cost in a fair and transparent manner by mainstream institutional players' (Joshi, 2014, p.1).

Financial inclusion has two important components: financial access and financial usage. Demirgüç-Kunt, Beck and Honohan (2008, p.28) remark that 'access essentially refers to the supply of services, whereas use is determined by demand as well as supply'. The reason that both these components are important to measure is because having access to financial services does not automatically translate into (regular) use. A bank account can serve as an entry point to the formal financial sector and put people on the right path towards financial inclusion, but it does not ensure that they are going down this path (World Bank, 2014). Usage of a formal bank account often becomes an additional, available channel for poor people to regulate their finances (Collins et al., 2010). De Koker and Jentsch (2013) show evidence that having a bank account is positively correlated with the probability of using informal financial services. This can explain why the 2011 Global Findex data finds a high number of dormant bank accounts in developing countries (Demirgüç-Kunt and Klapper, 2012a). So instead of measuring the 'percentage of banked adults', a more suitable indicator for financial inclusion would be the 'percentage of adults who actively use a bank account' (Rhyne, 2012).

For (new) formal financial services to be adopted, prospective customers need to be persuaded that it is beneficial to alter the way they manage their money. So the new and improved financial tools that are offered must surpass the performance of the existing informal tools, while at the same time aligning to the needs and money management patterns of the target clientele (Rhyne, 2012). Further factors that have an important influence on both financial access as well as usage are the direct and indirect costs, the accessibility, the time savings and level of convenience, the reliability, the level of trust and finally the risk of holding cash and related safety (Wright et al., 2013; Yamini et al., 2010). Williams and Torma (2007) capture the progression of demand for financial services in the banking ladder model, moving from the informal to the formal sector. They question if the willingness to pay for banking services is a consequence of price insensitivity, because features like security and convenience are identified as important by the users, or that it clearly reflects the exploitation of market power through extracting economic rents from consumers with no alternative.

Financial access is more challenging to establish empirically than financial usage. There have been various studies (Burges and Pande, 2005; Bruhn and Love, 2009) that have researched the relationships between access to financial services and socio-economic development or poverty alleviation of the

rural and poor population. Demirgüç-Kunt and Klapper (2012b) find that financial inclusion is positively and significantly associated with the number of access points[6] and the same authors (2012a) also find a strong correlation between bank account penetration and the general income inequality, as measured by the Gini coefficient. According to Alexandre, Mas and Radcliffe (2010) financial access has become an accruing policy interest, especially since empirical evidence has started to affirm modern development theories that state that increasing access to finance is both pro-growth and pro-poor (less unequal growth). Beck, Demirgüç-Kunt and Peria (2008) find a positive and significant correlation between economic development and both access to and use of traditional (formal) consumer financial services. The research by Sahn and Stifel (2003) found that in Sub-Saharan Africa the living standards in rural communities lag far behind those in urban areas. A new financial service like mobile money deployments could help widen the access to the financial markets for especially the lower income and rural population. The quantitative part of the thesis follows this distinction between the rural and urban users and their respective financial inclusion.

On financial usage, there is substantial evidence that the poor have a latent demand for savings. There are five general categories that can possibly explain why people 'undersave' in bank accounts, namely transaction costs, lack of trust and regulatory barriers, information and knowledge gaps, social constraints and behavioural biases (IPA, 2013). When people can't make use of formal saving tools, they opt for alternative, informal methods like saving "under the mattress", saving at a friend's or family's house and informal saving groups. In low-income countries most people save informally, even among adults who have a formal bank account (Demirgüç-Kunt and Klapper, 2013). A study conducted by Jack and Suri (2011) showed that about 80 per cent of the households saved money ''under the mattress'' at home. Dupas and Robinson (2013a) showed that micro-entrepreneurs in rural Kenya face major savings constraints, and these constraints can be so great that 40 per cent of market women, one of the sample groups in the study, decided to take up a formal savings account which offered a negative real interest rate. This result implies that alternative options offered these women an even greater negative expected return. Another study by Dupas and Robinson (2013b) showed the importance of saving: providing individuals with simple, safe informal savings technologies could already lead to more investment in preventative health and less vulnerability to health shocks.

Next to saving, people can also receive loans in the financial system. Common reasons for having an outstanding loan in developing countries are: emergency or health issues, school fees, funerals and weddings. According to the Global Findex data set, adults in developing countries are three times as likely to borrow money from family and friends (25 per cent) than from formal financial institutions (8 per cent). Many adults also reported to use credit at shops than report borrowing from the formal sector (Demirgüç-Kunt and Klapper, 2012a; 2013).

In the literature, different kinds of barriers to access and usage of formal financial services are indicated, which will briefly be discussed below. Many of these barriers tend to decline as the per capita GDP increases. The fundamental issue to explore is if 'the lack of inclusion derives from a lack of demand for financial services or from barriers that impede individuals and firms from accessing the services' (World Bank, 2014, p.2). This distinction between voluntary or non-voluntary exclusion is

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[6] Proxy for the number of access points was the number of commercial bank branches per 100,000 people.

showed in Figure 2. In this figure, Demirgüç-Kunt, Beck and Honohan (2008) first classify the population into two groups: users and nonusers of financial services. The latter group is then divided into those that are voluntary and those that are involuntary excluded from the formal financial system – even though in reality it is rather challenging to disentangle voluntary non-use from the involuntary – since it cannot be presumed that all non-users are

Figure 2. Distinguishing between access to finance and use
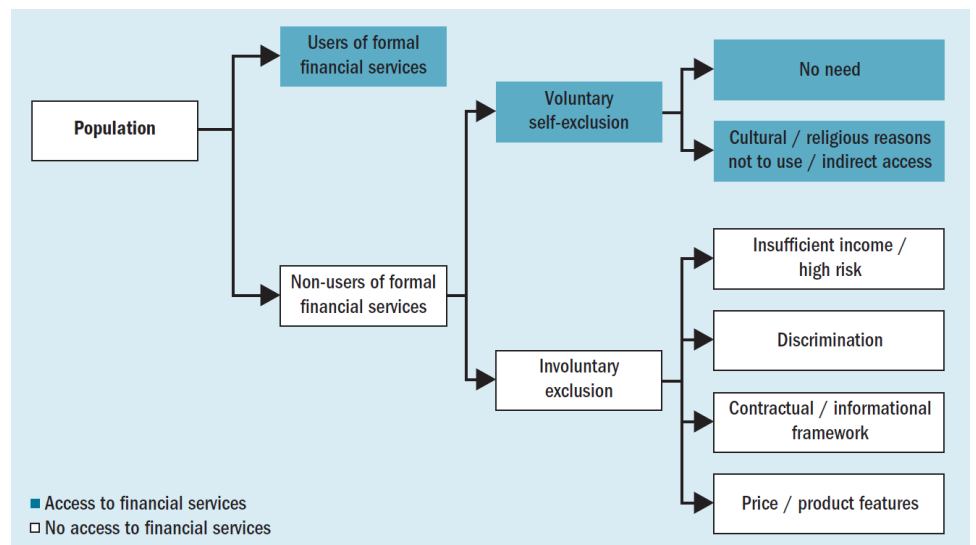
SOURCE: DEMIRGÜÇ-KUNT, BECK AND HONOHAN, 2008

somehow constrained from participating in the formal financial system. People can voluntarily choose to avoid financial services, because they do not have any need for it or they can reject it for cultural or religious grounds. It is then a lack of demand rather than a lack of access that drives their non-usage. To prevent distortions and financial instability, individuals and firms that don't demand financial services should not be targeted; financial access should not be expanded for the sake of access (World Bank, 2014). Voluntary exclusion can also arise from a lack of awareness, because of ill-targeted marketing of financial products, because financial services are in-directly used through another person's account or due to financial illiteracy. Financial illiteracy can be a big limitation to accessing and correctly using formal financial services, being aware of economic opportunities and making informed decisions. Lastly, people can also voluntarily decide to remain formally unbanked, because they wish to keep their financial life private due to tax considerations or fear for possible government surveillance, increased transparency and in the case of mobile money, for identity theft and cybercrime (De Koker and Jentsch, 2012). The other group are the non-users that are being involuntarily excluded from financial services: those who are interested in, but can't access, financial services. This category can be divided into a few subgroups. The first subgroup is being excluded because of insufficient income or because they portray an excessive lending risk in the eyes of the financial institutions. The second subgroup can be excluded due to discrimination on ethnic, social or religious grounds. A third reason for exclusion can be because the outreach to certain areas may be considered too expensive to be commercially viable for financial institutions. Other examples of barriers are regulatory impediments, legal hurdles or poor contractual and informational environments. While it is not alarming that the first group is being excluded by financial sector policy, the remaining three groups demand attention (Demirgüç-Kunt, Beck and Honohan, 2008).

Finally, affordability is an important barrier to account ownership for large parts of the population. Often, high annual fees are charged and high minimum balances are required to open and maintain a bank account, especially compared to the average national GDP per capita (Beck, Demirgüç-Kunt and Peria, 2008). On average 25 per cent of the unbanked adults worldwide cited that the services were

too expensive and this percentage increased to 36 per cent in Sub-Saharan Africa (Demirgüç-Kunt and Klapper, 2012a; 2013).

Evidence from the 2011 Global Findex suggests that women, youth and the very poorest segments of the population are typically financially excluded (Demirgüç-Kunt and Klapper, 2012a). The Global Findex survey asked unbanked respondents[7] worldwide why they did not have a bank account and the most frequent reply - given by 65 per cent[8] of the adults and 81 per cent of the adults in Sub-Saharan Africa - was that they did not have sufficient income to use one. This response implies that these adults with small, irregular and volatile income streams might regard the costs that often accompany formal bank accounts as an unnecessary expense and probably find that under their current circumstances the benefits of having an account do not outweigh the costs (Demirgüç-Kunt and Klapper, 2012a; 2013). Allen, Demirgüç-Kunt and Peria (2012) find that government policies that promote financial inclusion can help change the perceptions of individuals that financial services are not easily accessible for them.

Apart from the abovementioned requirements, clients also need to be able to afford their transport to the branch, which adds to the overall transaction costs. Long distances are mentioned by 20 per cent of the unbanked respondents of the Global Findex survey. In low-income countries, adults were significantly more inclined to cite long distances as a reason for not having a formal account, especially when living in rural communities. The lower the income scale of the country, the more frequent this barrier was mentioned by respondents: from 10 per cent in high-income countries to 28 per cent in low-income economies and even to 31 per cent in Sub-Saharan Africa. (Demirgüç-Kunt and Klapper, 2012a; 2013). Beck, Demirgüç-Kunt and Peria (2007) state that since branches have been the traditional bank outlet, a first rough indicator for a lack of physical access is the geographic distance to the closest branch or the number of branches relative to the population. A better, yet less available proxy than branch or ATM penetration within a country would be the average distance from households to a branch or an ATM (Demirgüç-Kunt, Beck and Honohan, 2008). Technological innovations that can conquer the barrier of geographic access, such as m-banking, could thus have a real effect.

Another commonly reported reason for not being banked (given by 23 per cent of the respondents worldwide and 75 per cent of adults in SSA) is that a family member already owned an account. Women have reported using someone else's account significantly more often than men, which implies that women face possible difficulties in acquiring account ownership (Demirgüç-Kunt and Klapper, 2013). Furthermore, 18 per cent of the respondents worldwide and 30 per cent of the adults in Sub-Saharan Africa have mentioned the lack of necessary documentation[9] as an impediment. Especially younger adults in Sub-Saharan Africa come up with this reason. With the high level of informality in many low-income countries, it is not surprising that only a small share of the population can meet the documentation requirements (Demirgüç-Kunt and Klapper, 2013; Demirgüç-Kunt, Beck and Honohan, 2008).

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[8] 12 per cent of the respondents worldwide and 7 per cent of the respondent from SSA chose none of the provided answers.
[8] Of which 29 per cent of the non-account holders cited it as the only reason.
[9] Like identification papers, wage slips or formal proof of residence.

In the Global Findex data set, the last two commonly cited reasons for not having a bank account were a lack of trust in the formal sector (reported by 13 per cent of the respondents worldwide and 16 per cent in Sub-Saharan Africa) and religious reasons (respectively 5 and 4 per cent) (Demirgüç-Kunt and Klapper, 2012a; 2013). Trust problems can arise when clients have negative banking experiences or if they are scared of fraud. Obtaining the trust of the (potential) customers requires more patience (Benamata and Serva,2007).

Since many people face multiple barriers to the access and use of formal bank accounts, it is expected that tackling only one constraint may not have much positive effects if the other barriers still exist. The last couple of years, branchless banking has become an essential factor in the debate about financial inclusion. Branchless banking services is seen as a method to increase financial inclusion through better access to and potentially increase the use of financial services, and potentially diminishing the financial infrastructure gap in Africa. This thesis will research if m-banking has a positive effect on the level of financial inclusion through the increased usage of financial services. In the following section of this literature review, the focus will be on branchless and specifically mobile banking.

2.2 Branchless banking

The introduction of the mobile phone in developing countries has spread so rapidly that the number of people using mobile phones now exceeds the number of banked people (Porteous, 2006). Meanwhile, the telecommunication market has continued to mature, which has resulted in an evolution from the mobile phone as a simple communication tool into a service delivery channel. Mobile phones are now perceived as a key technological device that has the potential to alter lives through innovative applications and services (Aker and Mbiti, 2010). Aker and Mbiti (2010) discuss multiple courses through which mobile phones can potentially produce financial benefits to consumers and producers in Sub-Saharan Africa. Shamin (2007) finds that better connectivity significantly strengthens economic growth, because e-finance technologies lower both the processing costs for providers and the information expenses for users. It therefore expands the availability of finance for poor borrowers living in remote areas. Andrianaivo and Kpodar (2011) find that information and communication technology (ICT), including mobile phone development, has a significant positive effect on economic growth in African countries. Part of this positive effect of mobile phone penetration can be attributed to greater financial inclusion, because high mobile phone penetration enables access to deposits and loans.

Mas and Kumar (2008) examine the different options that financial institutions have to convert the potential of mobile phones into real financial access for low-income people. This is particularly interesting since, according to the prediction of Ivatury and Pickens (2006), poor people are more likely to carry out financial transactions through m-banking than wealthy people. Even though early adopters of new technologies are usually not predominantly the poor or the unbanked, there are encouraging signs that poorer population groups adopt these technologies relatively quickly (Aker and Mbiti, 2010; Ivatury and Mas, 2008; Jack and Suri, 2011).

According to the Consultative Group to Assist the Poor (CGAP), branchless banking refers to a 'new distribution channel that allows financial institutions and other commercial actors to offer financial

services outside traditional bank premises' (Lyman, Ivatury and Staschen, 2006, p.2). Alexandre, Mas and Radcliffe (2010) favour the more nuanced term 'banking beyond branches' because it does not suggest that branches are becoming obsolete in the foreseeable future. They state that the goal of this new technological innovation should be to support branches instead of replacing them: 'in the new cash ecosystem, retail outlets handle the last mile, but banks still do the long-haul' (Alexandre, Mas and Radcliffe, 2010, p.5). Branches will maintain two functions. They will first preserve their role as 'cash distribution nerve centres in support of the bank's non-bank retail outlets located in their catchment area' and secondly, they will need bases where they can sell complicated financial services to new and existing customers. Mas and Radcliffe (2010, p.12) identify a 'branch penetration ''sweet spot'' for mobile money, where penetration is not so high that it hampers demand for mobile money services, but not so low that agents are unable to manage their liquidity'.

Mas (2009) gives three core components that together constitute a branchless banking platform: the retail network, the payment network and the account platform. He also confers the minimum criteria that should be present when talking about branchless banking, consisting of several types of 'outsourcing' of activities from banks to non-bank actors (Mas, 2009). Branchless banking thus entails a partnership between banks, telecoms and retail players. This type of distribution model can convey financial activities that were previously executed at a branch to the client's hand, in this case through the usage of the mobile phone (Alexandre, Mas and Radcliffe, 2010; Dermish et al., 2011).

A subset of the broader domain of branchless banking is mobile banking, which allows customers to connect their mobile phone to their bank account. Mobile banking can be defined as 'a set of mobile banking services, involving the use of portable devices connected to telecommunications networks that provide users with access to mobile payments, transactions and other banking and financial services linked to customer accounts, with or without the direct participation of traditional banking institutions' or it can be understood as 'the banking channel through which the digital mobile services are provided by the institutions to their clients, by integrating the concepts of service and channel' (Diniz, Albuquerque and Cernev, 2011, p.5). M-banking includes both transactional and non-transactional services, such as clients being able to check financial information on their own mobile phone (MSFWG, 2013). Mobile banking has the 'potential to reach remote corners of the socio-economic, as well as the geographic, spectrum' (Jack and Suri, 2011, p.29). Most m-banking channels in the developing countries offer three main services: store value in a bank account that is accessible through the mobile phone, convert cash in and out of this account via branches or retail stores and transfer stored value between accounts (Donner and Tellez, 2008).

There are various mobile banking business models that can be distinguished, based on the roles of the players involved. The first is a bank-led model where the financial services are entirely being offered by banks, as is the case-study of this thesis, mHose (Rwanda). In such a model, the bank adds a mobile channel to their existing product range, arranges retail agents and takes ownership of the accounts (Porteous, 2006). Governments prefer the banks driving the mobile banking deployment (Demirgüç-Kunt and Klapper, 2006). Subsequently, the second model is the MNO-led model, like M-PESA in Kenya or G-Cash in the Philippines, where the telecommunication provider is responsible for the customer relationship and the financial service distribution channel. In this case clients exchange their cash for an electronic currency that they can store in a virtual e-money wallet on the server of the MNO. The third option is a hybrid model where a telecommunication company contributes to the branding,

product designs and/or distribution manner of a bank-based product. In most regulations of countries, the formation of account-based stores of value is considered as banking-related business (Porteous, 2006). The viability and potential of these different models are still being demonstrated. The focus of this thesis will be on the bank-led model.

Branchless banking can either have transformational or additive services, according to Porteous (2006). When m-banking is merely added to the banks' existing banking channels to the convenience of its existing clients, then this is referred to in the literature as the additive model. This has often been the case with mobile banking deployments, since banks are more driven by particular 'customer and segment profitability measures within defined geographies', but also because financial providers prefer targeting known markets when implementing a new technology or business model (Ivatury and Mas, 2008, p.7). In developed countries, the additive model is mostly followed. Porteous argues that a financial service becomes transformational when there is a shift in the access frontier, when the service extends to segments of the population who could never be (profitably) reached before through the traditional brick and mortar branches. He then discusses different reasons why mobile banking has the potential to be transformational. Tobbin (2012a, p.107) states that 'the transformational potential of m-banking is due to the increased access to the mobile communication infrastructure by the rural unbanked and the introduction of new players such as the MNOs (mobile network operators) and airtime merchants in the financial system'.

Furthermore, Mas and Radcliffe (2010, p.7) write that Safaricom's first objective when introducing M-PESA in Kenya was 'building the payment ''rails'' on which a broader set of financial services [could] ride'. They claim that M-PESA has illustrated that the mobile revenue model should be usage-based rather than float-based. The usage-based revenue model was developed and implemented by mobile providers in developing countries, who sell prepaid airtime in very low money value to ensure that every transaction is profitable on a stand-alone basis, regardless of the profitability of the buyer. It is this type of model that could make the cash-in/cash-out transactions at retail outlets sustainable and impartial (Mas and Radcliffe, 2010).

Making use of an adequate distribution network of retail outlets has many potential benefits. For financial service providers, agents can expand coverage to rural and remote areas where many of the poor and unbanked population live and work, decongest branches and make it possible to serve the large potential customer base at the bottom of the pyramid (Mas, 2009). Hence, agent networks help financial institutions overcome the 'traditional ''last mile'' barrier' by leveraging on infrastructure that is already in existence (Alexandre, Mas and Radcliffe, 2010, p.3). Mas (2009) then distinguishes between two types of agents that can both increase banking access: agents that help to decongest branches and agents that serve as bank outposts in remote areas.

Many authors (Porteous, 2006; Ivatury and Mas, 2008; Jenkins, 2008) recognize the importance of developing a shared agent network with common standards, in order to bring mobile banking to the next level by scaling up and greatly expanding access to finance. Interoperability can have a major impact on the growth in the number of mobile banking transactions. This is especially the case when there is a fragmented market share or a small market, like in Rwanda, where interoperability is essential to ensure a high enough level of consumer adoption through lower costs. Davidson and Leishman (2010) emphasize how vital it is that a distribution network is ubiquitous with low-cost, liquid

and trustworthy agents. Benson and Loftesness (2012) offer several ways how interoperability in payment systems can be realized.

In Sub-Saharan Africa, mobile financial services have been very successful. Demirgüç-Kunt and Klapper (2012a) report that 16 per cent of the adults there – and 31 per cent of the adults with a formal bank account – have utilized a mobile phone in the past 12 months to pay bills or transfer money. Many of the mobile money users would otherwise not be included in the formal financial system. Customers who connect to an e-payment system, greatly broaden their spectrum of financial opportunities. Jack and Suri (2011) discuss the potential economic effects that M-PESA can have at the household level, varying from impacts on investments and savings to risk management and insurance. In their most recent article *Risk Sharing and Transaction Costs: Evidence from Kenya's Mobile Money Revolution* they find convincing evidence that mobile money significantly helps households spread risk. Their findings show that negative income shocks lead to a 7 per cent drop in consumption of non-user households, while the consumption of households that used M-PESA remained unaffected. They argue that the reduced level of transaction costs, that can be attributed to a mobile money deployment, affects how social networks can help smooth risks (Jack and Suri, 2014).

Many studies have confirmed the varying advantages that mobile money services can have for users. The first benefit are the lower costs. McKay and Pickens (2010) found that m-banking prices were 19 per cent lower on average than the comparable, traditional bank services and it is expected that m-banking prices will continue to decrease as the market matures (McKay and Pickens, 2010). For financial institutions that offer m-banking products, costs of roll-out and costs of handling low-value transactions are reduced so extensively that they can address two big barriers to access: physical presence and offering products that poor people can afford (Ivatury and Mas, 2008). Mobile delivery systems can bridge distance and time, thereby reducing transport costs, stimulating instant connections and money flows between people, lowering travel and queuing time at branches. This thesis will explore if the presumed features of convenience (anywhere anytime) and efficiency have had a positive effect on expanding financial access. In addition, the new channel creates employment and thereby increases income, as higher demand for these mobile financial services must be managed(Aker and Mbiti, 2010; Alexandre, Mas and Radcliffe, 2010; Jenkins, 2008).

The deployment of a mobile money system has more benefits according to the literature. It was observed by Mbiti and Weil (2010) that M-PESA clients made less use of informal saving tools. Jack and Suri (2011) highlighted that the discreet nature of M-PESA helped people enlarge their personal savings, since friends and family were more uninformed about the timing or amount of financial transactions, and Morawczynski (2009) noticed that due to M-PESA Kenyan women could privately start saving, without involving their husbands, which empowered them and altered their bargaining power within the household. Later Aker et al. (2013) provided evidence that the households that received money electronically had a higher diet diversity, which can potentially be explained by time savings and changes in intra-household decision-making due to greater privacy.

There have been quite some studies that have looked into what issues hinder financial access and subsequently financial usage. Mobile network providers mention that the biggest barrier they face are customer adoption issues that typically accompany a new product or service, like a willingness to pay and a lack of trust or awareness among users (Porteous, 2006). It is evident that users should not find the costs of buying and using a mobile phone and the m-banking services unaffordable (Diniz,

Albuquerque and Cernev, 2011). In addition, according to Gu et al. (2009) it is very important to make clients feel comfortable with the new service and that sufficient guidance and instruction is provided. They state that banks need to remove the fear among users and develop structural assurances in order to increase the trust among new and existing customers. The effect of the introduction of mobile technology on the trust in financial institutions is discussed by Benamati and Serva (2007). Even though the tolerance threshold for errors and fraud in the mobile banking context is not yet clear (Ivatury and Mas, 2008). A study conducted by Ivatury and Pickens (2006) found that the rate of adoption is affected by the perceptions that people have about banking, m-banking and technology. They found that m-banking services were appreciated by poor people (although not the poorest) in South Africa. In addition, the m-banking product WIZZIT was more affordable than traditional banking. The authors underlined that a better understanding of the unemployed and unbanked segment may lead to a different and more fitting branding and marketing by financial service providers, with e.g. a focus on security or convenience depending on what users deemed most important. According to Ivatury and Mas (2008), the perception of the value of saving in formal financial institutions needs to be altered in order to convince people to entrust their money in their accounts. The unbanked population also has unique, individual characteristics – like age, income and education level - that can possibly affect adoption decisions and can be relevant determining factors of m-banking usage (Ivatury and Pickens, 2006; Tobbin, 2012a; Gutirrez and Singh, 2012). This thesis will examine if a real difference exists between the socio-demographic characteristics of m-banking and non m-banking clients. Ivatury and Mas (2008) emphasize the importance of keeping user interfaces of mobile banking simple in order for it to work for the poor, lower-educated and financially excluded, while Medhi, Gautama and Toyama (2009) investigate which user interface is preferred by non-literate and semi-literate individuals. There are thus quite some elements that need to be taken into account if a bank or MFI wants to correctly introduce a mobile banking product.

The potential benefits of mobile banking should not be overlooked, as it creates access for the unbanked and 'underbanked'. According to McKay and Pickens (2010, p.11), m-banking has great potential 'to reach vast numbers of low-income, unbanked people at affordable prices with a wide range of products to meet their complex financial needs' as many of the world's banked 'who nominally have access, but find the quality of service falls short, either in cost, convenience, security, or functionality', also known as the underbanked (McKay and Pickens, 2010, p.4). However, the potential of m-banking to be transformational can only be realised if beyond financial access, the other varying barriers to financial inclusion, like trust, compatibility and affordability, can be properly addressed in the deployment of the m-banking service (Tobbin, 2012b). Within these deployments, MFIs have a few advantages over other financial providers like understanding the financial needs of their low-income client base better and acquiring their trust more easily – a key barrier to customer adoption – because of their pre-mobile banking history of offering personalized service to their clients (Saxena, 2009). Although Ivatury and Mas (2008) argue that agents and mobile phones can't provide the same personal service as branches and loan officers. As Ivatury and Pickens (2006, p.8) stress: 'm-banking providers […] must find the right balance between human interaction and technology to appeal to more low-income customers'. An MFI in Kenya that replaced group loan cash repayments with repayments with M-PESA detected that the number of on-time repayments decreased and that clients stopped attending group meetings (Ivatury and Mas, 2008). It will be interesting to ascertain if this has also occurred when UOB introduced their mHose product.

2.3 Analytical Framework

Based on the literature review, the analytical framework for this thesis can be visualized with the following chart:

Figure 3. Analytical Framework
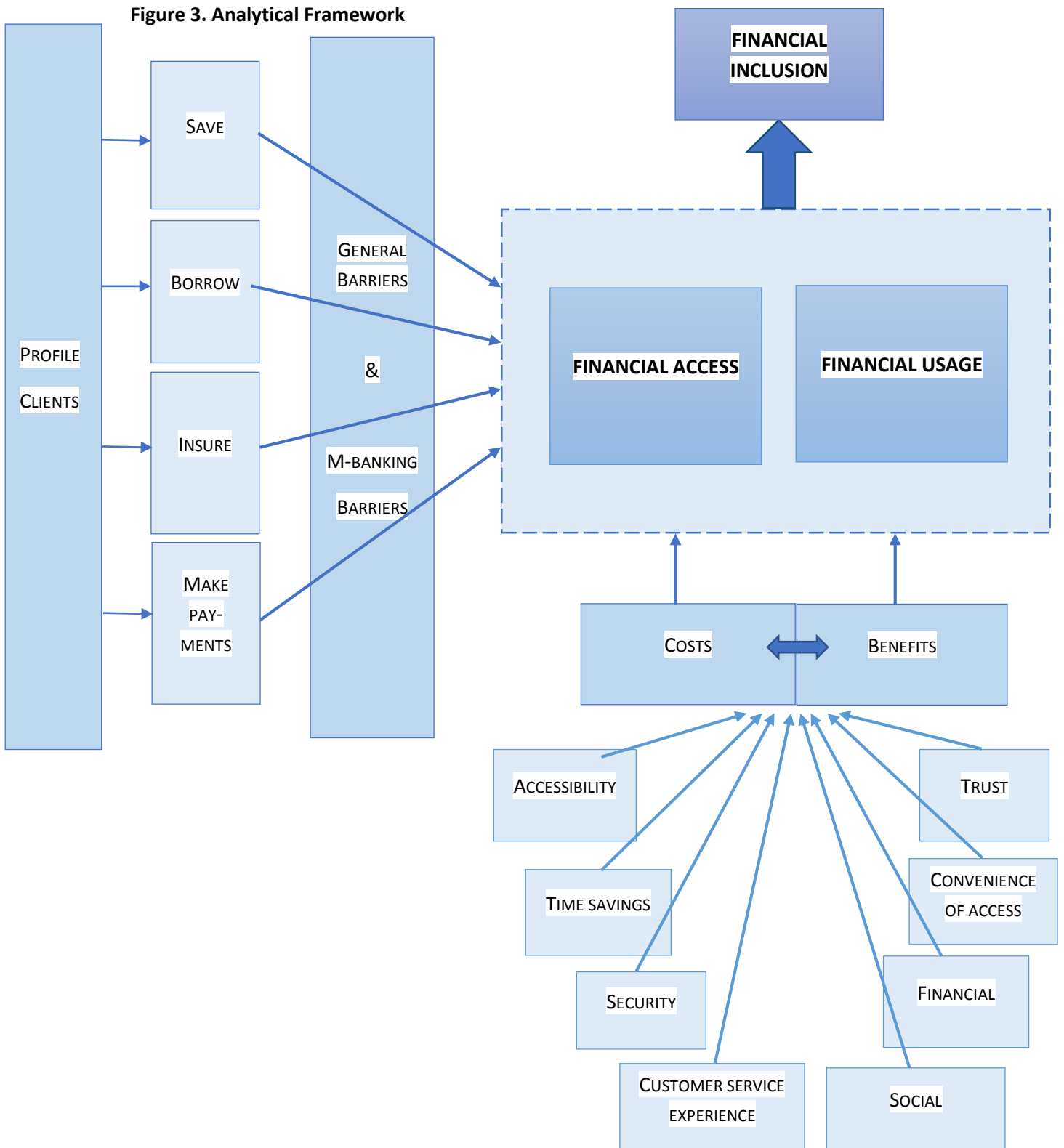
The chart shows that, as discussed in the literature review, financial inclusion occurs when financial access is provided to all parts of society and when this access subsequently translates into active use of those financial services. The assumption is that especially rural, generally low-income people are being excluded from the financial system than the urban population, due to a range of barriers. Many of these barriers are general barriers to financial access and use, but mobile banking will also result in some new barriers. To understand if m-banking has a positive effect on financial inclusion, it is necessary to understand what type of people actually use, and benefit, from the service. In addition, it is essential to understand how the benefits of m-banking are perceived, in order to align the service with the needs of the unbanked.

In the framework, there are two angles to assess financial access and use. The first angle is to look at the profiles of (potential) clients, the financial services that would fit those profiles and the barriers that are being encountered, either specific to m-banking or more general. The second angle focuses on factors that determine the costs and benefits for the users of financial services. These factors can be very practical, like convenience or access (travel time) or more fundamental, like trust or the social environment. Both angles are being tested against the data from the field research.

3. Methodology and Data Collection

3.1 Research Methodology

This study will apply a mixed method approach, which will include client data analysis, focus group discussions (FGDs), a telephone client survey and use of secondary data. This means that qualitative as well as quantitative data will be collected and analysed.

To get a better insight in the socio-demographic characteristics of the clients that use the mobile banking service and those who don't, a profile analysis is conducted with data from the mHose client database of UOB. Outcomes of this client profile analysis will be compared to the general profile of the Rwandan unbanked population, which is gathered from the 2012 FinScope Survey Report of Rwanda.

In this thesis, the focus will be on the following three groups:

- **The mHose users:** UOB clients that have used the new mobile financial service in the latest month (client profile analysis) or latest two months (telephone survey).

- **The mHose non-users:** UOB clients that stopped using for at least one (client profile analysis) or two months (telephone survey), or that had never used the mobile financial service. As mHose is relatively new and UOB presses their clients to register for the service, there is a significant proportion of mHose-registered clients that does not actively use the new mobile service. It is expected that these registered non-users, on which data has been collected, are similar to the overall non-using clientele of UOB (thus including the non-registered).

- **The unbanked:** the Rwandan population that do not have a bank account.

For the client profile analysis, users were defined as such if they made at least one mHose transaction in March 2014 (the latest available month). However, this definition excludes the clients who didn't use mHose in March because they were new clients or because their loan had matured and had not (yet) been renewed. To ensure that the choice for at least one transaction in March did not bias the outcomes (since the regularity of usage cannot be measured in one month), it was verified if the findings would be very different if registered mHose clients would have 'conducted at least one transaction in February and one in March'. Since this was not the case, the more simple definition has been chosen.

As discussed in the literature review, financial inclusion is built out of two essential components: financial access and financial usage. A set of proxy indicators are assigned to these two components and have been included in both the interview questions for the FGDs as well as the survey questionnaire. Cross tabulations (with the Pearson chi-square test) and t-tests have been applied to the quantitative data using the Statistical Package for the Social Sciences (SPSS) software.

3.2 Methods of Data Collection

As mentioned above, both primary and secondary data sources are used to answer the research questions in this thesis. The primary data was collected through numerous focus group discussions

with clients and Relationship Officers[10] (ROs) from UOB, a client telephone survey and the mHose registered client database. In addition, internal sources of secondary data were used; gathered from the private data files of UOB. And finally external sources of secondary data were used from traditional academic articles, practitioner-oriented, non-peer reviewed sources, the World Bank Global Financial Inclusion database and the World Bank's World Development Indicators (WDI) database[11].

Primary data sources

First, the mHose registered clients in UOB's client database were classified through a binary indicator as either m-banking users or non-users, according to the definition above. Subsequently, a client profile analysis was conducted to determine if both groups differed significantly from one another on the variables geographical location, gender and age.

Second, through qualitative research it was attempted to generate in-depth, non-numerical insights. Focus group discussions are a good research instrument to obtain qualitative information about the outcomes of the m-banking deployment for the clients. First, a focus group interview guide was written together with the experienced PHB consultant, after which two local UOB staff members were trained in the facilitation and minute-taking of focus group discussions. A proper training of both staff members was essential since the FGDs would occur in the local language Kinyarwanda. The training had to ensure that both staff members understood what kind of information was wanted, that they knew how to facilitate discussions without probing, how to create good group dynamics and how to select and note the essential key points in the wording of the participants. The client interview guides started with a short introduction of the research team and an explanation as to why the clients were asked to participate and why the research could be relevant for them. To mitigate the social desirability bias[12], respondents were also reminded to talk freely and frankly about their experiences and beliefs. It took about one and a half hour to carry out the four exercises that focused on respectively deposit and withdrawal with mHose, saving through mHose, paying loan through mHose and the improvements that the clients would like to see. The answers to every exercise were written on a separate big A0 sheet, that was laid out in the middle of the circle of clients. In order to stimulate participation, the following tools were employed: coins, drawings and purple post-its. Even though we could not understand the local language, it was still feasible to make interesting observations on how the participants interacted throughout the FGD. Occasionally the facilitator translated some issues for us during the session. In the second week of the PHB mission, aside from the six FGDs with clients, also four FGDs with Relationship Officers were scheduled. The discussions with the latter concentrated on how they experienced the effects of mHose on the client's behaviour and the responses they received from the clients about the new delivery channel. The FGDs with the ROs transpired either in French or English. Again, big sheets were used to write down the given answers, with purple post-its and drawings as stimulating tools. The list of participants and both interview guides can be found in the appendices.

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[10] A Relationship Officer is the new name for UOB's loan officers.

[11] The World Bank's World Development Indicators (WDI) database provides global development data compiled from officially recognized international sources.

[12] Social desirability bias occurs when the respondents tend to provide socially desirable response to convey a positive image (of themselves) instead of giving their true feelings; this usually becomes an issue when socially sensitive questions are asked. No (financial) incentives were given to encourage participation.

Finally, with a telephone survey, quantitative inputs have been obtained about the effects of the m-banking deployment for the clients. Two questionnaires were designed: one for the m-banking users and one for the non-users. Both questionnaires started with a short introduction to ease the interviewee, explain the purpose of the interview and mitigate social desirability bias. Besides personal client data, the questionnaire for the users contained 22 short, closed questions and took approximately ten minutes. The questionnaire for the non-users had 5 closed questions and one open question, which took about five minutes in total. Subsequently, two Call Centre staff members (out of the four) were trained in the objectives of the survey, in how to conduct telephone interviews and in how to manage the procured data. The questions were also reviewed during the training to get valuable inputs and insights from the Call Centre staff members. At the end of the training, a pilot test has been performed to examine the respondent's behaviour to the questions and to review if the questions were comprehensible and clear. After making some adjustments, the questionnaires had to be translated in Kinyarwanda, since all the telephone interviews would be conducted in the local Rwandan language. This was done by the two Call Centre staff members, after which their translation was verified by another local staff member. The English version of both questionnaires and the list of respondents can be found in the appendices. To ensure that statistical conclusions could be drawn, a significant number of clients had to be interviewed. In order to mitigate selection bias, both sexes needed to be represented and selected in diverse areas and chosen randomly. The survey was conducted from about mid-March to the beginning of May 2014. The telephone survey data was captured using the SPSS software again.

3.3 Sampling Methods

In the microfinance field, loan groups are groups where members cross guarantee each other's loans. The focus group discussions were held with the existing loan group clients who were registered for UOB's mHose service, and the Relationship Officers that served them. UOB staff members were asked to ensure a balance between the number of urban and rural clients, and between the active mHose users and those that had stopped using or never used mHose. Two branches in the capital city of Rwanda, in Kigali-East and Kigali-West, two locations in the North-West of Rwanda, near the border with Uganda, and two in the South-East of Rwanda were selected. It was further demanded that five individuals from three different loan groups were chosen, in order to stimulate different experiences and opinions about the new mobile delivery channel. A UOB staff member provided a list with the names of the participants for every location, and with help of the UOB client database I verified whether the criteria were met.

However, upon arrival, it was usually the case that the groups and group members that had been selected were not present (any longer) or had not been informed by the relevant branches. So instead, individuals were chosen on the spot with the help of the responsible Relationship Officers, based on our criteria of approximately five people from three or four groups, mixed gender presence and a balance between mHose users and non-users. Sometimes certain unforeseen settings made it difficult to limit the amount of participants to fifteen to twenty people. It should thus be noted that in the end the participants in the FGDs did not constitute a preselected, representative sample, which makes it harder to draw firm conclusions on the relative importance of the different issues that were raised. In addition, an FGD in one branch in the South-East (Bugesera) was cancelled due to time limitations. Instead, this enabled a visit to a further and remote area near the border with Burundi. In the end, a

total of 82 clients participated in the five FGDs that were held in five different locations: Kigali-East, Kigali-West, Musanza, Cyanika and Ruhuha. In addition, four FGDs with a total of sixteen Relationship Officers were held from the following branches: Kigali-East, Kigali-West, Musanze and Bugesera. Apart from the different geographical location, the only other requirement was that these ROs had experience with mHose registered loan groups.

For the telephone survey, this research made use of a sampling technique known as 'stratified random sampling'. The mHose registered client database was divided into four subgroups: urban mHose users, urban mHose non-users, rural mHose users and rural mHose non-users. From every subgroup, sixty people were randomly drawn, which gave a total of 240 individual interviews. The findings from this survey are thus representative and can be extrapolated to the entire mHose registered client population. The age distribution of the respondents by gender is depicted in the figure below:

Figure 4. Age Distribution in the telephone survey, by gender (in % in each age group)
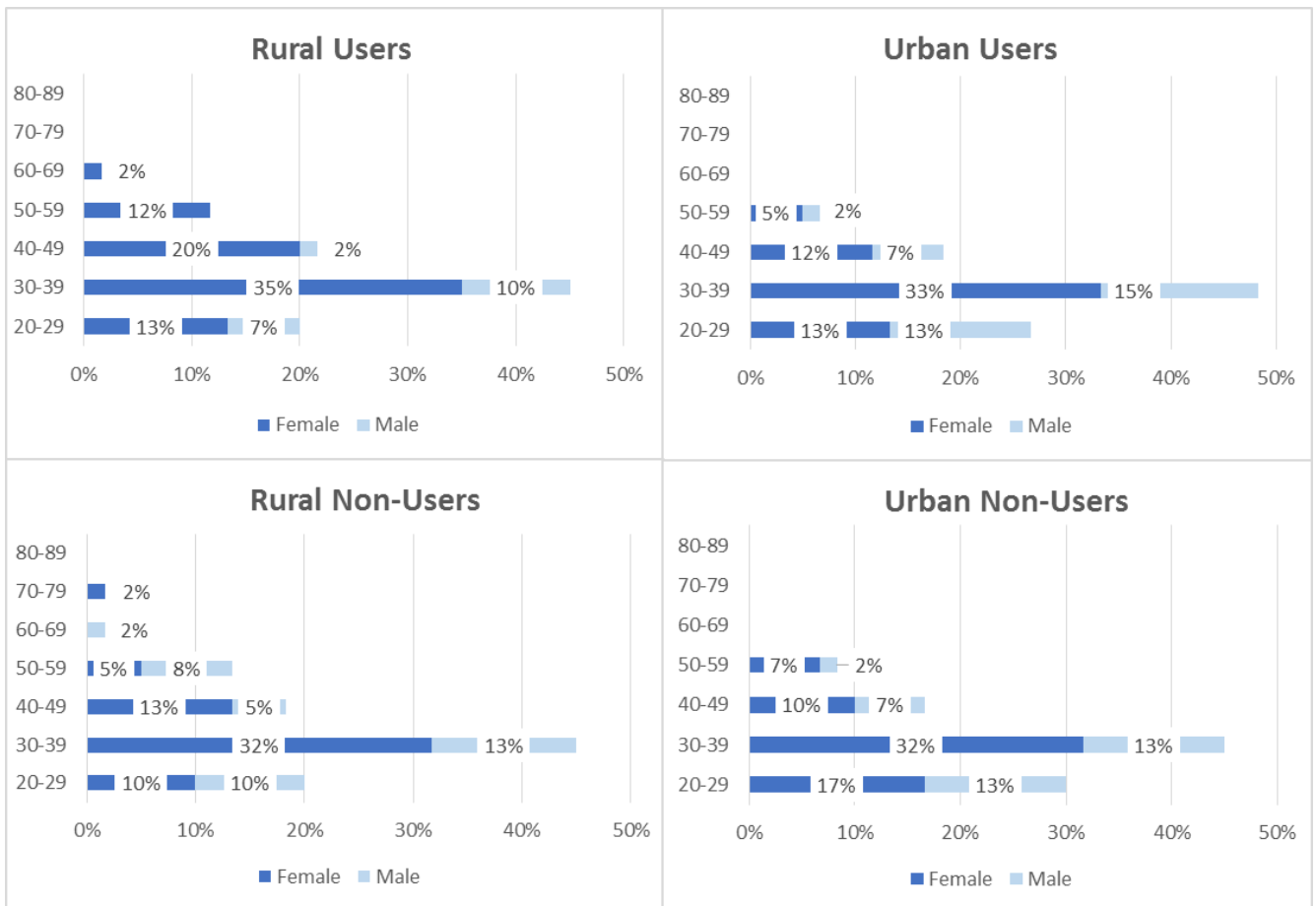
SOURCE: TELEPHONE SURVEY, 2014

According to the National Gender Statistics Report (NISR, 2013) approximately 51.8 per cent of the Rwandan population is female. Hence, the figure above clearly shows that the focus of UOB is especially on women. Furthermore, the reason why some age groups are less represented in the sample is because according to the World Health Organization (2014) the life expectancy at birth in Rwanda was 66 years in 2012.

4. Research Area

This chapter will first provide some background information on Rwanda, especially on the level of current development on mobile banking and financial inclusion in the country. Subsequently, more general information about UOB is presented, which will be followed by information on UOB's mobile banking deployment.

4.1 Background - Rwanda

After the genocide in 1994, Rwanda has come a very long and spectacular way in achieving sustainable development (MINECOFIN, 2013a). For example, Rwanda has managed to acquire the 32th position out of 183 countries (from the 150th position in 2007) in the World Bank's Doing Business Report for 2014 (World Bank, 2013). Rwanda's national *Vision 2020* envisages transforming Rwanda into a knowledge-based, middle-income country that is less dependent on foreign aid and where pro-poor growth receives the principal attention (MINECOFIN, 2000). This long term *Vision* is made operational through a serial medium-term national Poverty Reduction and Economic Development Strategies (EDPRS).

The small, land-locked country currently has a population of about 11,5 million people (World Bank, 2012a). Even amidst the 2008 global financial crisis – which fortunately only had a modest direct impact on the Rwandan economy – the developing country has experienced an averaged 8 per cent annual economic growth from 2006 up to now (Napier, 2010; IMF, 2014). During the first EDPRS (2008-2012), the main driver of growth was the services industry, with in particular a significant expansion of the telecommunication sector.

The dominant objective of Rwanda's second EDPRS (2013-2018) is 'accelerating progress to middle income status and better quality of life for all Rwandans through sustained growth of 11.5% and accelerated reduction of poverty to less than 30% of the population' (MINECOFIN, 2013a, p1). In the period between 2006 and 2011, the poverty headcount ratio[13] (at national poverty line) fell with approximately 12 per cent to 44.9 per cent, while the poverty gap[14] (at national poverty line) decreased with about 10 per cent to 14.8 per cent. This poverty reduction was largely realized thanks to high growth rates and a stabilising population growth of 2.8 per cent annually between 2006-2012 (World Bank, 2012a). As envisioned in *Vision 2020*, Rwanda's objective is to reduce the number of people that live below the national poverty line from 72.1 per cent in 2006, to 63.2 per cent in 2011, to 20 per cent in 2020 (MINECOFIN, 2012).

While the Rwandan population is becoming increasingly urbanized, still more than three quarters of the Rwandan population resided in rural areas in 2012. The percentage of rural people living below the poverty line in Rwanda was still more than twice as high in 2011 as the percentage of urban people (World Bank, 2012a). However, higher usage rates of informal products in rural areas confirm that there is a need for financial services despite high levels of poverty (Napier, 2010; Collins et al., 2010).

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[13] Poverty headcount ratio at national poverty line (% of population) = percentage of the population living below the national poverty line

[14] Poverty gap at national line (%) = mean shortfall from the poverty line (counting the non-poor as having zero shortfall) as a percentage of the poverty line

Hence, as the GDP grows and the population becomes wealthier, the demand for formal financial services increases. FinScope (2012) also found that formal financial inclusion increased with the socio-economic status of the household.

One of the core policy components of the government's implementation strategy for *Vision 2020* is the Financial Sector Development Program (FSDP), which has the goal to improve the lives of Rwandans through increased financial inclusion and greater participation in economic activities (Andrews et al., 2012). In Figure 5, the segmentation of the Rwandan population is shown. FinScope recognises four segments: the formally banked, the formally served[15], the financially served[16] and the financially excluded. So according to FinScope, the 'formally included' are the people that are being served by either a commercial bank or a non-bank formal financial channel. In the figure, a significant drop in the number of financially excluded Rwandan adults[17] can be noted (FinScope, 2012).

Figure 5. FinScope Rwanda Financial Access Strand: 2008 - 2012
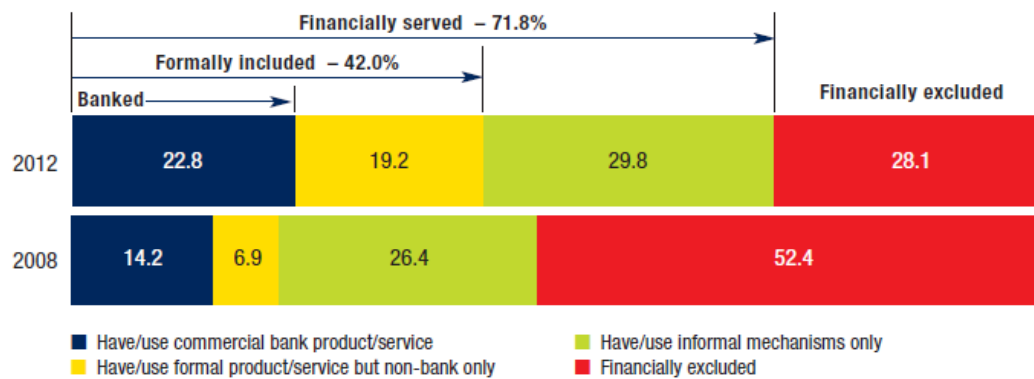
SOURCE: FINSCOPE, 2013

The Government of Rwanda (GoR) has set a target of 80 per cent financial inclusion by 2017 and is well on track to reach this target. The *Vision 2020* goal of 90 per cent inclusion is marked as a very high priority and the government realises that creating an enabling environment for financial institutions and other competitors is the key to stimulating a broader range of low-cost financial services on the market. However, it will be more challenging to increase the percentage of the financially included beyond this 90%-level, as it will then be necessary to expand the outreach to the two poorest population segments. The Rwandan government has also acknowledged the need to adequately educate individuals on financial concepts and products, to ensure effective use of the available financial services. Therefore the government has rolled out a national, district-focused financial education and literacy program in order to increase the overall financial understanding within five years (Andrews et al., 2012).

Another key objective of the government is to enable a cashless society by 2017; this has led to an active involvement of all the players in the financial and mobile field. Since 74 per cent of Rwanda's adult population resides in rural areas (FinScope, 2012), the potential of mobile delivery channels to

[15] When served by either a commercial bank or a non-bank formal financial channel (e.g. NGO, government services, MFIs, SACCOs, insurance companies, Western Union, mobile money service providers, money transfer service providers).
[16] When served either formally and/or informally.
[17] Total adult population (≥18) in Rwanda in 2012 was 4,5 million adults (=100%).

reach the unbanked is highly recognised by the government. Therefore, Rwandan authorities have very proactively established a comprehensive regulatory framework that will encourage the use of electronic delivery channels. ICT and mobile technologies are being adopted in all government activities, resulting in a greater usage of technology across the country and spurring demand (MINECOFIN, 2013a). In November 2011, a notable partnership was signed between the Rwandan government and Visa with three essential goals: laying out the foundation for electronic payments, stimulating electronic payments innovation and building the country's financial capacity (Biallas, Ngahu and Stefanski, 2012).

The GoR allows both mobile operator-led mobile money models and bank-led mobile banking models. The main mobile network operators in Rwanda, who all offer their clients mobile money products, are MTN, Tigo and Airtel. Apart from UOB, other players in the Rwandan banking sector that have launched mobile financial service initiatives are: Bank of Kigali (BK) Banques Populaires du Rwanda (BPR), Kenya Commercial Bank (KCB), Banque Commerciale du Rwanda (BCR), Equity Bank and Fina Bank (Biallas, Ngahu and Stefanski, 2012).

It has been acknowledged that in Rwanda the only cost-effective method for advancing financial services and transactions throughout Rwanda's limited, addressable market is through using a shared agent network. Hence, exclusive contracts between banks and agents are prohibited. The government further stipulates that 'the bank must accept liability for all actions carried out on its behalf by it agents' and that every agent must be approved by the National Bank of Rwanda (BNR) (Andrews et al., 2012, p21).

4.2 Urwego Opportunity Bank of Rwanda

Urwego Community Banking (Urwego) was a leading MFI in Rwanda since being founded by World Relief Rwanda in 1997 and had been operating as an independent and regulated MFI since 2004. In 2007, Urwego and Opportunity International Bank of Rwanda[18] merged into what is currently known as Urwego Opportunity Bank of Rwanda Ltd[19] or UOB (UOB, 2012a).

As a result of the merger, UOB has a unique organizational structure consisting of Enterprise Business Units (EBUs; originally the field offices of Urwego) and branches (originally the field offices of OIBR). The branches offer clients full banking services including cash deposits and withdrawals on deposit accounts, while the EBUs solely focus on the lending side.

The headquarter of UOB is located in the capital city Kigali, but the microfinance bank has a country-wide presence in all thirty districts of Rwanda. UOB is serving over approximately 200,000 clients through its microloans, savings accounts and micro insurance products. Their mission is 'to provide a ladder of opportunity to the underprivileged of Rwanda so they can attain dignity and hope, improve their lives, and become contributing members of their communities' (UOB, 2012a). *Urwego* means 'ladder' and hints to the bank's commitment to pull Rwandans out of poverty. UOB offers both group and individual loans, with a general focus on females and micro entrepreneurs. One of the bank's

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[18] The known international microfinance network Opportunity International (OI) founded Opportunity International Bank of Rwanda (OIBR).

[19] Opportunity International owns 50 per cent of the shares, Hope International 37 per cent and World Relief 13 per cent.

principal financial products are the group loans called Community Banking Loans (CBL) and require group members to cross guarantee for one another's loans. After receiving a four-week training for entry, group members are required to weekly repay the borrowed money over a total period of sixteen weeks. If the loan obligations are successfully fulfilled, clients have a chance to become eligible for another CBL, the more flexible and longer term Advanced Community Banking program or the Micro-Business Loan[20] (UOB, 2012a).

4.3 UOB's mobile banking deployment

In 2011, UOB seriously started looking into mobile banking. After an unsuccessful attempt to partner up with MTN, UOB was approached by Visa in early 2012 to explore collaboration. Visa had selected Rwanda as one of the first countries worldwide to roll out their new mobile money platform mVISA, which was designed to meet the basic banking needs of Rwanda's unbanked and underserved population. The idea of Visa was to set up an interoperable platform that works across different financial institutions and mobile network providers. All the agent networks set-up by the adjoining banks would be accessible to all mVISA users: clients with an mVISA account could go to any mVISA agent, irrespective of the institution that has contracted that agent. Thus mVISA provides the interoperable technology for mobile transactions (Spector and Mant, 2013).

Between February 2012 and July 2012, UOB and Visa launched the first pilot ever with mVISA technology. Some 157 UOB clients from four different loan groups surrounding the capital of Kigali participated in the pilot. A loan was disbursed to the participants, which they were able to repay at two mVISA agents. The pilot offered valuable findings and highlighted various benefits and challenges to UOB and Visa. After the pilot, UOB has chosen to become an mVISA partner, as did the Bank of Kigali. The remainder of 2012 was spent on preparations for the commercial launch and in January 2013 UOB's mobile banking system mHose[21] went live. The first month was spent testing the user-friendliness of the technology on the staff and finally the first group of customers was registered in February 2013. However, mHose seriously took off in April 2013 (Biallas, Ngahu and Stefansk, 2012; Meakin, 2014; Spector and Mant, 2013). In June 2014, it became known that I&M Bank Rwanda was the latest to join the mVISA interoperable network, while KCB and Equity Bank have already committed to joining mVISA (Gasore, 2014; MINECOFIN, 2013b).

Figure 6. Timeline of the preparation and implementation of mHose

2011		2012												2013											2014		
11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Project start			Pilot test					Project design						Go live			Implementation and roll-out											

SOURCE: UOB, NICK MEAKIN, 2014

Rather than offering their customers a separate mVISA eWallet, UOB preferred to give all mHose registered clients direct access to a UOB current account, known as the *Teganya*[22] account. The mHose service permits customers to execute the following functions from this account: money transfers to

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[20] The Micro Business Loan offers clients the option to grow a business with lower collateral requirements than the formal banking sector.

[21] Officially the service is called 'mHose mVISA', but this is normally shortened to just 'mHose'.

[22] Teganya means 'plan ahead' in Kinyarwanda

other people registered for mVISA, deposits and withdrawals, their own or another customer's UOB loan payments, their own or another customer's airtime top-up, 'pay merchant' when making purchases at a shop, 'pay bill' (like water, electricity, DSTV) and checking their account balance (see Figure 7 below). Interest is paid monthly over their average daily account balance, and no minimum deposit amount or minimum balance is required. In addition, when registered for mHose, life insurance is offered to clients with an average balance of more than Rwandan Franc (RWF) 50,000[23] and to two additional family members when it's more than RWF 100,000 (UOB, 2012b).

Both UOB clients and agents receive an 'mVISA ID' after registration, which in combination with their phone number will be their personal identification. After clients set their mPIN in the given timeframe, the registration is completed. If customers or agents need any support, they are able to contact the new UOB Customer Support Call Centre. When a client wants to deposit or withdrawal, they can either go to a mVISA agent, an EBU or a branch. UOB is signing up businesses in the vicinity of its clients to act as their agents. These agents are required to be readily accessible to the UOB (and BK) customers, have sufficient float in their *Teganya* accounts and enough cash on their premises to service customer withdrawals. In the future, it may be possible that UOB will disburse loans to their clients through mHose agents (UOB, 2012b).

Figure 1. How the mHose menu emerges on the mobile phone of the customer
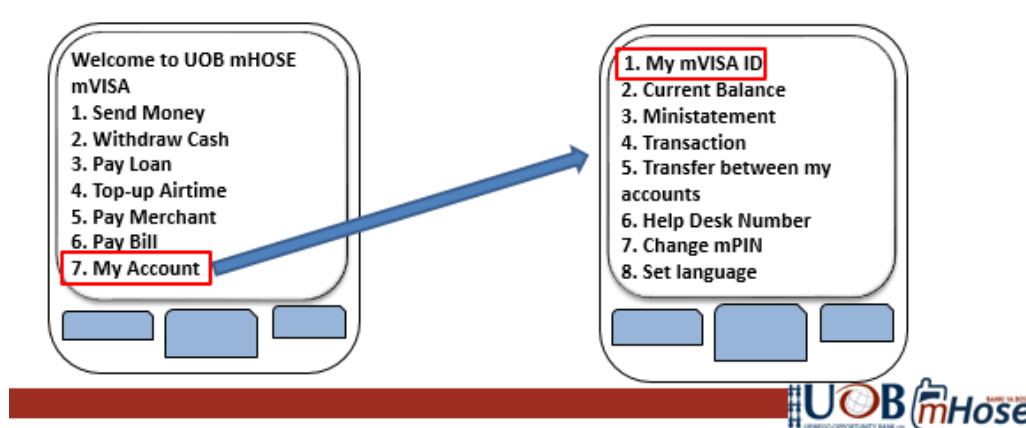
SOURCE: UOB MHOSE STAFF TRAINING, 2013

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[23] On December 31, 2012: EUR 1 = RWF 831,74
On December 31, 2013: EUR 1 = RWF 931,23

5. Client Profile Analysis

This chapter will first focus on how the client outreach of UOB has been since the introduction of mHose and the type of transactions that are being used through mHose. Subsequently, a client profile analysis will be performed on UOB's mHose users and non-users, where attention will also be paid to both group and individual clients. This chapter will give a general profile of the unbanked Rwandan population, and will conclude with a comparison of the different profiles.

5.1 Client outreach of UOB

As depicted in Figure 8, UOB registered more than 22,000 clients for mHose between March 2013 and February 2014. Of this number, more than 3000 clients (14,5 per cent of the total) were new UOB clients. It is also shown in the figure that 40 per cent of the total mHose registered clients could be defined as active users (at least one financial transaction in the past month), even though this number decreased somewhat over the past year. This is relatively high compared to the global average mobile money activity rate[24]. Finally, about 9 per cent of the mHose registered clients had enough savings to qualify for the free life insurance that is offered by UOB (Meakin, 2014).

Figure 8. Development of UOB's mHose customers
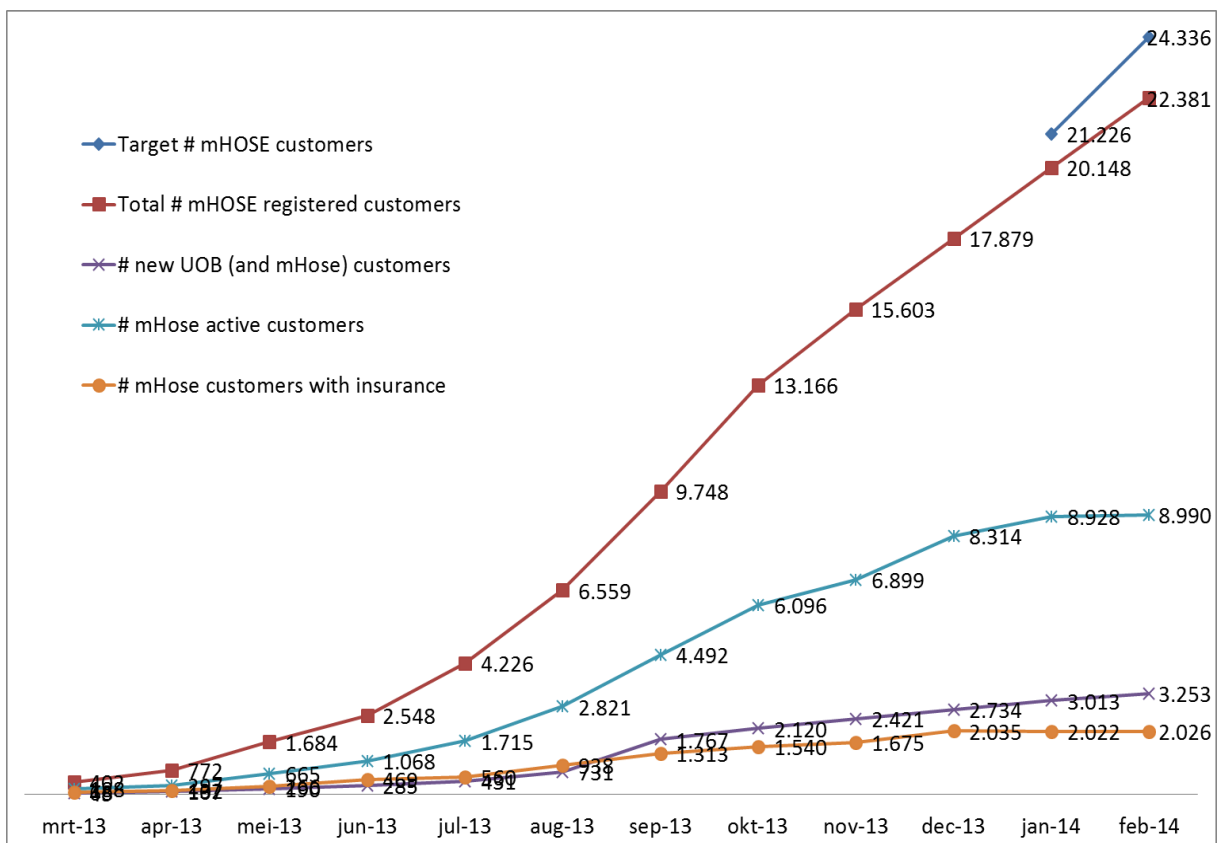
SOURCE: UOB, NICK MEAKIN, 2014

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[24] According to the GSMA State of the Industry 2013 (Pénicaud and Katakam, 2013), on a 30-day basis there are globally 37 million active users out of the 203 million registered accounts. This gives a worldwide activity rate of about 18%.

5.2 mHose transactions

In the client profile analysis, registered mHose clients were measured as (active) users when they conducted at least one successful transaction with mHose by telephone or at an agent in March 2014. The different types of mHose transactions are: depositing cash at an agent, paying loan, sending money, topping-up airtime, paying a bill, paying a merchant or doing a balance enquiry with mHose.

UOB clients especially use mHose for repaying their loan. Since it's first often necessary for clients to deposit cash on their *Teganya* account, cash deposits are the second most common mHose transaction (Meakin, 2014). In Figure 9, a difference can be observed between the depicted 'Pay loan'- and 'Cash deposit' line, because many clients still deposit cash at the EBU or branch (which doesn't count as a mHose transaction). The third most popular mHose service enables users to directly 'Top-up Airtime' from their account balance. According to GSMA State of the Industry 2013, airtime pop-ups is one of the most popular mobile money products worldwide (Pénicaud and Katakam, 2013). The figure also shows that the remaining mHose services – 'Pay bill', 'Cash withdrawal' and 'Send money' are barely used. However, this is not very unexpected given that UOB targeted their mHose promotion on the 'Cash deposit' and 'Pay loan' service. Besides, Rwanda is a small country which makes sending money via a mobile channel less interesting compared to countries like Kenya and South-Africa.

Figure 9. Number of mHose transactions by type
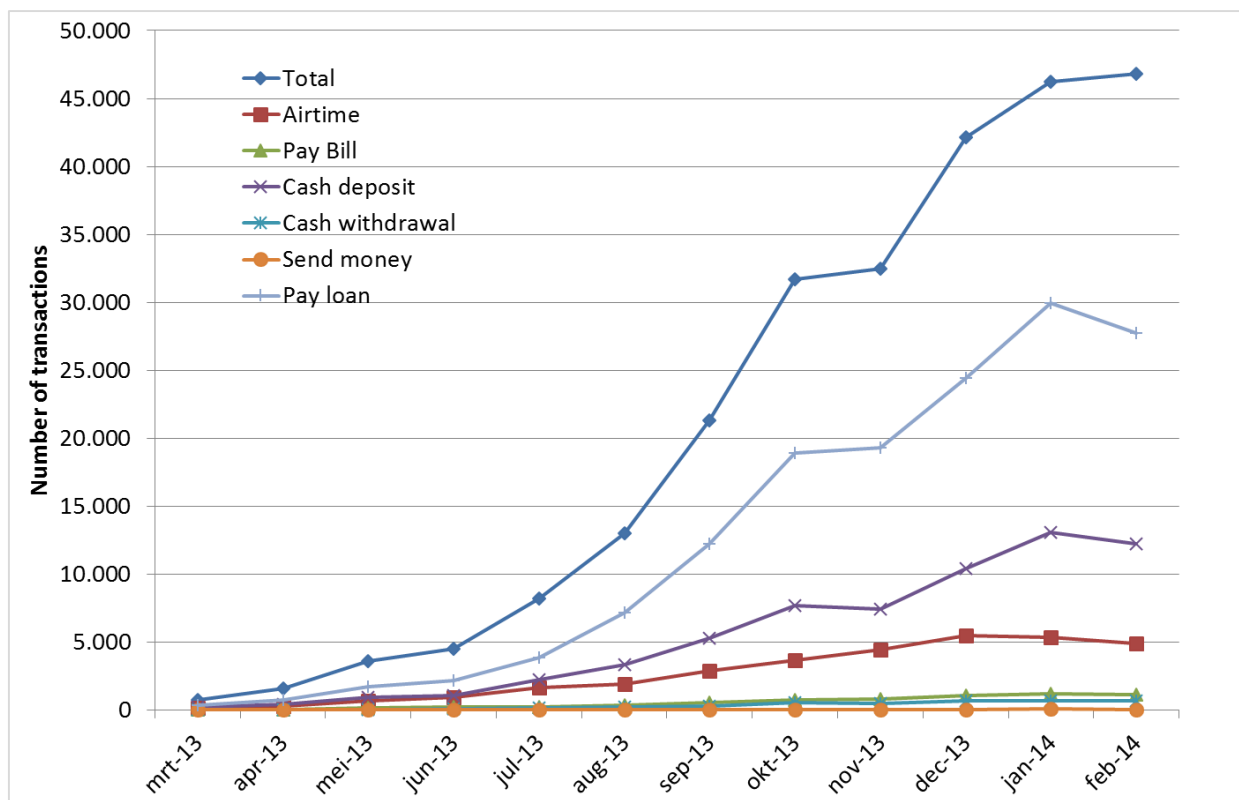
5.3 Group client profile analysis: mHose users versus non-users

The UOB client database was comprehensive enough to allow an analysis of the mHose client activity by location, gender and age[25]. Of the total of 23,636 clients that UOB registered as mHose clients, 81% were loan group clients and are included in the group client profile analysis. It was verified with UOB that the clients with incomplete data were either random errors within UOB's registration system or because the system was not yet up to date, and that excluding these clients would not lead to biased results.

Table 1. Group client profile analysis: Usage mHose on location, gender and age (March 2014)

	User	Non-User	Test for Equality[a]
Ratio variables			
Age	36.16	36.80	-4.62***
	(8.85)	(9.62)	
N	8,050	10,129	
Nominal variables			
% that live in an urban area	64%	34%	1654.64***
N	8,517	10,699	
% that are female	72%	78%	103.68***
N	8,509	10,684	

Notes: [a] T-test for equality of means for ratio variables; Chi-Square test for nominal variables
Robust standard deviations in parentheses
*** Coefficient significant at 1 per cent or less

Data analysis showed that mHose group users were on average **urban, female and 36 years** old, while non-users were on average **rural, female and nearly 37 years**. This thesis, as well as UOB, defines urban clients as those living in the capital Kigali. In Table 1 a highly significant difference can be observed between those living in an urban area and those living in an rural area: the chance that urban dwellers use the mHose service is nearly twice as high compared to rural dwellers. Possible explanations for this difference can be that urban clients tend to have a higher level of education and are better connected to the existing technology, or because the roll-out of mHose started in Kigali before it was implemented in the rural districts. The table also shows that 72 per cent of the mHose users and 78 per cent of the non-users were female, and both groups differ significantly. This percentage seems very high, but it should be noted that the financial services of UOB are especially focused on women: 76 per cent of the total registered group clients were female. This means that men are slightly more inclined to use mHose. Finally, there is a highly significant, yet small difference in age between group users and non-users of mHose. Younger segments of the population are overall more literate and more familiar with new technological devices like mobile phones. In Figure 9, it can be observed that there is an overall negative relation between mHose usage and age. The very high usage rate by over 80-year olds is due to the fact that only a total of four group clients in the database were over 80 and three of them happened to have used mHose in March 2014.

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[25] The registration forms of UOB also included fields for the collection of data on other indicators that can influence the usage of mHose, like education and type of employment. Unfortunately it was not mandatory for clients to fill in these fields, with the result that this data was missing for most clients.

Figure 10. Group clients: mHose Usage by Age Distribution (March 2014)
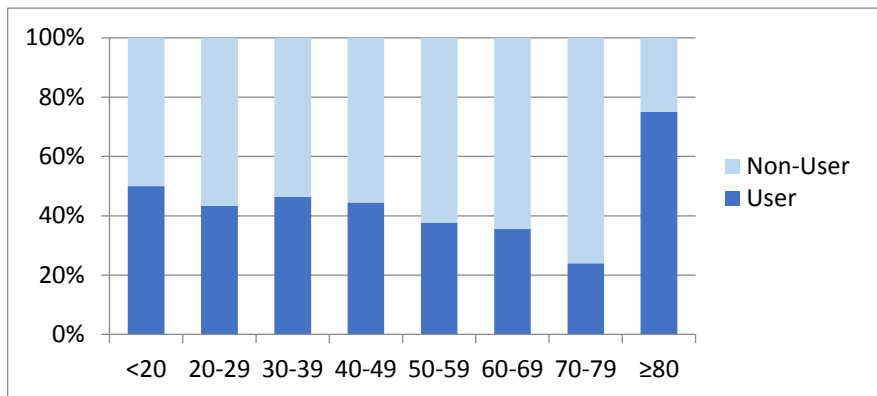
SOURCE: UOB DATA ANALYSIS, 2014

5.4 Individual client profile analysis: mHose users versus non-users

In the client database of UOB, there were 4377 clients (18,5% of the total) that had individually registered for mHose. Unfortunately it was not specified in the mHose client database where these individual clients resided.

Table 2. Individual client profile analysis: Usage mHose on gender and age (March 2014)

|	User	Non-User	Test for Equality[a]
Ratio variables			
Age	30.27	30.27	-0.016
	(6.95)	(8.36)	
N	699	3,419	
Nominal variables			
% that are female	31.5%	27.5%	4.806**
N	734	3,610	

Notes: [a] T-test for equality of means for ratio variables; Chi-Square test for nominal variables

Robust standard deviations in parentheses

** Coefficient significant at 5 per cent or less

Overall, individual clients were much less inclined to use the mHose service (17%) than the group clients (44%). This is surprising because one would expect that the individually registered clients would make more use of mHose, since the mHose was not imposed upon them. Possible explanations can be that these clients don't have loans to repay - the mHose function that is currently the most utilized – and therefore make use of mHose more randomly, which cannot be captured in one or two months only. It is also possible that these clients automatically filled in the mHose registration form during the UOB registration process, or because they receive less training and assistance in the use of mHose. As can be observed in Table 2, the individually registered mHose users were on average **male and 30 years** old. The non-users did not have a different client profile. Even though there was a significant difference between both sexes, there was no significant difference at all in age between the individual mHose users and non-users. That significantly more individual males used mHose might be explained

by the overall higher literacy rate of men or the prevailing cultural biases against mobile phone use by women. Figure 11 shows the inverted U-shape in the age distribution.

Figure 11. Individual clients: mHose Usage by Age Distribution (March 2014)
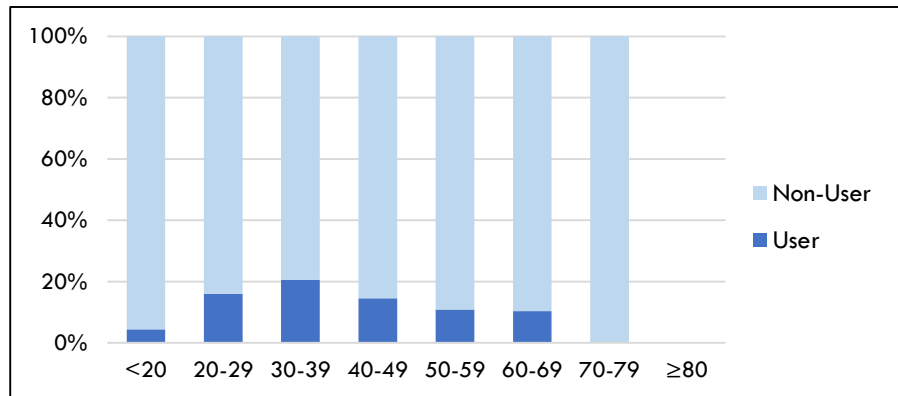
SOURCE: UOB DATA ANALYSIS, 2014

5.5 General profile of the unbanked Rwandan population

Within the unbanked population, a distinction can be made between the financially excluded and those who are not-formally served. The former are adults[26] who are neither formally nor informally financially served, while the latter includes the adults who are informally served only[27], as well as those who are financially excluded.

FinScope (2012) found that more than 70 per cent of the adults who were not formally served lived below the Rwandan poverty line[28], while this was only the case for 40 per cent of the formally served population. These percentages indicate the difference formal financial services can make for the poor. According to the survey, 45 per cent of the not-formally served adult population offer market opportunities for formal financial providers; which could result in an overall higher inclusion rate.

 FinScope (2012) reported that financial exclusion and the use of informal financial mechanisms was considerably higher in areas outside of the capital Kigali. This thesis applies the definition that every location outside of the capital city is defined as a rural area. The 2012 FinScope study confirmed the choice for this definition by showing that there was no significant difference between adults residing in rural areas and adults living in urban areas outside of Kigali.

According to FinScope (2012), the financially excluded Rwandan population were on average **rural, female, and younger than 20 years or older than 60 years**. This profile does not change for the not-formally served population. This is shown is Table 3.

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[26] An adult is an individual who is 18 years or older.

[27] Informally served includes financial services from an informal lender, such as a shop owner, community-based money lenders, friends, family, informal savings group, VSLAs, agricultural associations or sending money to family/friends by means of a taxi/bus driver.

[28] The Rwandan poverty line of RWF 13,397 per adult per month.

Table 3. Overview of the unbanked Rwandan adult population

Total adult population: 4,5 million	Not-formally served (58%)	Of which, financially excluded (28%)
% urban adults	34%	21%
% rural adults	62%	29%
% female adults	64%	32%
% male adults	50%	22%
% adults 18 to 20 years	72%	43%
% adults 21 to 25 years	60%	30%
% adults 26 to 30 years	57%	22%
% adults 31 to 35 years	48%	17%
% adults 36 to 40 years	48%	20%
% adults 41 to 45 years	49%	20%
% adults 46 to 50 years	61%	27%
% adults 51 to 55 years	56%	26%
% adults 56 to 60 years	61%	32%
% adults older than 60 years	72%	48%

SOURCE: FINSCOPE, 2012

5.6 Comparing the different profiles

Only 15 per cent of the Rwandan adult population lives in the capital city Kigali. In contrast, 47 per cent of the mHose registered group clients reside in Kigali. The remaining percentage lives in the rural areas, where many of the unbanked reside. Limited access and poverty, typically prevailing in rural area, are the most common reasons in the literature for explaining being unbanked (Tobbin, 2012b).

The current level of financial inclusion, or lack thereof, could be explained by the client profiles. The barriers these clients face have been discussed in the literature review.

- MHose non-users are on average rural, female and 37 years old. The rural factor can be explained by typical barriers like generally lower income and greater distances (see also next chapter). That mainly females are non-users comes from their dependency on their male counterparts, who would control the family finances and claim the mobile banking phone. The age factor probably relates to the social position at that age. It can be concluded that mainly the urban clients, who have a bigger chance of being banked, first use mHose. It is difficult at this stage to conclude anything meaningful on financial inclusion of the rural poor, as the mHose system is still young. The distinction that loan group users are generally female is the result of a higher reliability on credit repayments.

- Compared to the general profile of the unbanked, it can be concluded that m-banking non-users don't differ on location and sex. However, non-users did fall within the age range that has the biggest chance of being financially included. This can be explained by the fact that non-users already had financial access to a formal institution, namely a micro-finance bank.

- Individual m-banking users do not have a different profile than the non-users, but their profile does differ substantially from the unbanked population. This implies that measuring the effects of m-banking on this already largely financially included group should not be a major focus.

6. The benefits, costs and barriers of m-banking

This chapter will first discuss the benefits, costs and barriers that were mentioned during the qualitative and quantitative field research that has been performed with UOB's clients. It will be examined if urban and rural m-banking users, due to the existing financial inequality gap between both geographical locations, significantly differ in their assessment of UOB's mHose service. It will be investigated if some of the mentioned benefits (will) indirectly have a positive effect on the level of financial access in Rwanda and what the main negative effects can be. The work is based on the analytical framework, as described in chapter two. However, as the field research data refers largely to UOB clients and therefore have access, the financial inclusion question will primarily focus on actual use of financial services.

6.1 Accessibility

The literature review discussed that mobile banking is presumed to have a positive effect on the level of access to formal financial services. Increased access can be achieved in different ways: existing clients can get better access to existing or new financial services, or new clients can enter the formal financial system. The field research findings regarding this expected benefit, are discussed below.

During every focus group discussion, many clients mentioned that the big advantage of mHose was being able to pay their loan 'anytime, from anywhere'. They underlined that mHose had increased the access to the financial services that they were already using; it was now 'easy to pay loan'. The telephone survey showed that nearly all urban and rural mHose users had utilised the new mobile channel to deposit cash or repay their loan at some point after registration. However, by making it mandatory for Relationship Officers to register their clients for this new mobile service, UOB implicitly added new access barriers to their financial products. According to participants of the FGDs, these barriers are: the need to own or the possibility to borrow a mobile phone, to own a SIM card, to live in an area with sufficient network coverage, to know how to read, to know how to use a mobile phone and finally to understand the mHose menu (or at least having someone available to help). A few customers remarked that they don't use mHose because their Christian belief does not allow them to use a phone or according to a few ROs, some men don't permit their wives to have a phone. The ROs also stressed that it was more challenging to get elderly people to buy and/or use a mobile device and thus also the mHose service.

During the FGDS, it was suggested by ROs that they should be able to refrain from placing every group in the mHose system. They pointed out that some clients even threatened to leave the bank if they were pushed to use mHose. This indicates that it is important that UOB offers their new mHose service as additional instead of an obligatory option to their clients.

Figure 12. Use of mHose financial services
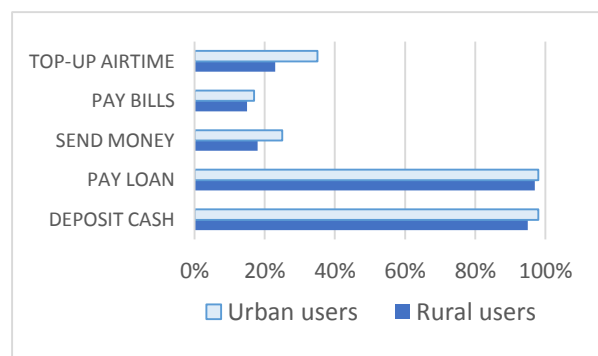
SOURCE: TELEPHONE SURVEY, 2014

With the introduction of mHose, UOB's existing clients have also gotten access to new financial services, like 'Top-up airtime', 'Pay bills', 'Send money' to friends and family and 'Pay merchant'[29]. Although focus group participants identified these new financial functions as very useful, the survey showed that these new services were less tested by users (see Figure 12). In Table 5 it can be observed that urban and rural mHose clients do not significantly differ in their choice for the various mHose functions. Furthermore, only one (urban) client focus group expressed the advantage of access to life insurance, when using mHose. This is not surprising, given that only 9 per cent of the mHose registered clients had enough savings to be eligible for this product. However, many clients were also not informed by the lending staff about the insurance benefits. According to clients, other mHose related barriers to access (and use) of financial services were the relatively small number of agents, who could still be difficult to reach from the client's location and their limited availability (e.g. not working in the evenings or weekends).

Finally, UOB indicated in conversations that they have not yet really attempted to target new customers with mHose. In the first year of mHose, UOB decided to focus on the training and registration of existing UOB group loan clients, the roll-out of the agent network to all the districts where UOB is active and solving malfunctions of mHose and the system. However, branch staff were supposed to offer mHose to existing clients who came to make a transaction at the branch, as well as to new UOB clients. Of the total number of clients that were registered for mHose for the first year, more than 3000 clients (14,5 per cent) were new UOB clients. Thus, until now, mHose has not had a real effect on the number of new clients that obtain formal financial access.

However, the potential of mHose to make a difference for the not-formally served segment is widely recognized by the bank. Focus group participants already underlined the benefit of receiving a free (savings) account at UOB and attaining access to banking services. Even though the number of new UOB clients has not been very high yet, it should be noted that with the introduction of mHose and the roll-out of an agent network, UOB has added 229 additional financial access points throughout Rwanda. The exact number of agents that BK installed in Rwanda is unknown, but this is also expected to be quite significant. And with the I&M Bank that recently joined the mVISA network, and the KCB and Equity Bank joining in the near future, the total number of new financial access points in Rwanda will be substantial.

6.2 Time savings and convenience of access

Another potential benefit of m-banking is the higher level of convenience and time savings for the client. As mentioned in the literature review, a client's perception about the amount of convenience or time they gain from using the mobile financial channel, can influence the uptake and usage of the service.

In every client FGD, it was noted that mHose saves the users time, which can then be spent on other activities. There are multiple ways how mHose can affect time spent. First, clients prefer the closest financial access point, be it the branch or the agent. With mHose, people can suddenly transact from home and the expanding agent network means that quite some people find a point of access closer to

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[29] Pay merchant was not included in the telephone survey, because it had not yet been properly introduced to UOB's clients.

home, which means a reduction in travel time. The telephone survey reveals that significantly more rural than urban mHose users (46 and 36 per cent respectively) think that it is easier to go to an agent than to a UOB branch or EBU (where the group meetings are held). This is shown in Figure 13. The telephone survey also shows that both groups choose to deposit their money in significantly different locations: after using mHose, 40 per cent of the urban and 60 per cent of the rural users decided to go to an agent to deposit cash on their *Teganya* (voluntary savings) account in the past four weeks, while 50 per cent and 38 per cent respectively deposited their money at a UOB branch (Table 5). The Global Findex survey reported that 20 per cent of the adults in low-income countries cited long distances as a big barrier for not having a formal account. The percentages above clearly show how rural dwellers (where many of the financially excluded population live) significantly benefit from mHose and its corresponding agent network, as it reduces the geographical distance to a financial access point. Second, many clients in the FGDs are pleased that fewer group meetings save them time, and that these group meetings have become shorter in duration, since the loan payments of the group members occurs much faster. Third, most focus group participants feel that mHose saves them time in the actual transaction process, like reduced waiting time. More than 80 per cent of both urban and rural users that participated in the telephone survey, noted that the actual depositing of cash takes less time with mHose than before. This is illustrated in Figure 14. As expected, there appears to be no significant difference in how urban and rural users experience this benefit (Table 5).

Figure 13. Location of agent relative to location of group meeting
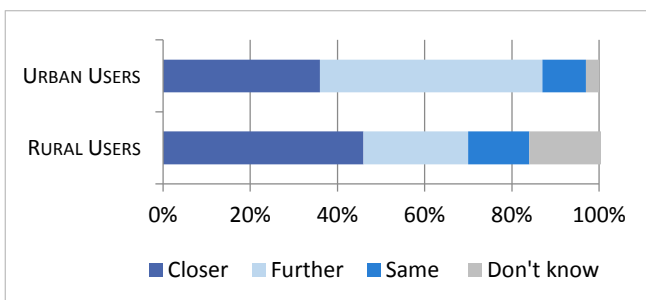
SOURCE: TELEPHONE SURVEY, 2014

Figure 14. Time spent per cash transaction
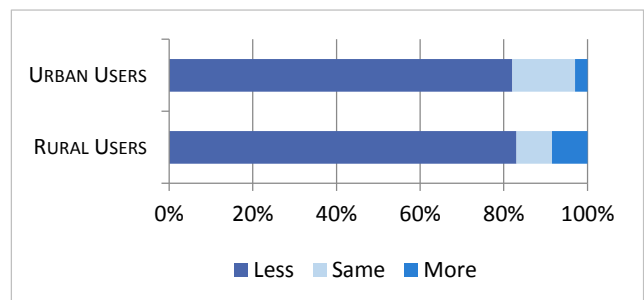
SOURCE: TELEPHONE SURVEY, 2014

Convenient aspects of mHose that were mentioned in the FGDs, included a quick option for clients to check the balance on their voluntary savings account and the Short Message Service (SMS) they received as a reminder from UOB just before the due date, providing information about the date and amount of their loan repayment. Some clients would have even liked the possibility of checking their compulsory savings via mHose. Other convenient mHose benefits that were highlighted were the increased flexibility for clients as to when to pay and the possibility to pay for a friend without the need to meet each other in person.

However, clients also reported several problems with the mHose service (Figure 15). Some issues were not intrinsic disadvantages of mHose, but were rather the result of mHose not (yet) functioning as it should. The most relevant topics mentioned were the frequent connection problems that hindered financial transactions, the incorrect content and the timing of the text messages. According to UOB's management, these problems were connected to the system and back office processes not functioning smoothly yet, and could be easily resolved. Yet it can already discourage clients from using mHose, which became clear when one of the groups mentioned they were no longer using the m-banking

service because of the above-mentioned problems. Urban and rural users did not experience significantly different problems with mHose.

Figure 15. Encountered problems with mHose service
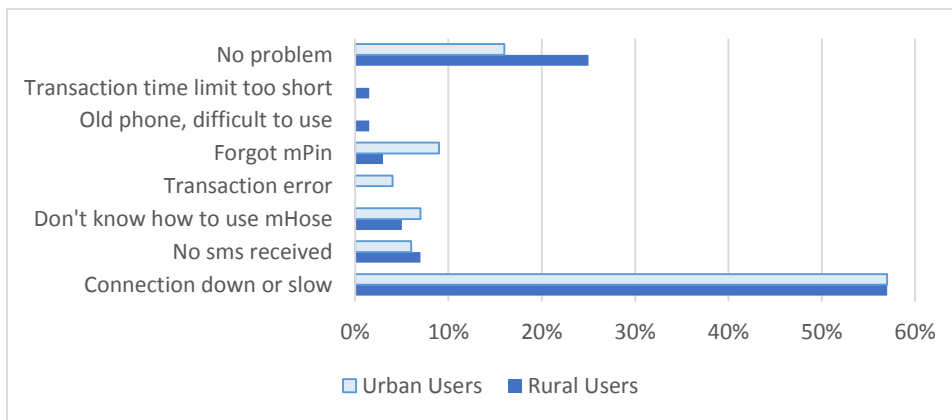
The other most-cited problems had to do with the functioning of the agent network. Even though UOB had tried to select agents in locations that would bring more convenience to their clients, FGDs revealed that agents were sometimes recruited near the branches or EBUs. This can explain why currently a majority of the mHose-registered clients are not (actively) using the mobile financial service. According to the telephone survey and FGDs, the biggest problems clients faced at the agent were an absent or slow connection, agents who were located too far away and agents who did not have enough cash or float to make transactions (Figure 16). Clients in the FGDs strongly advocated a more wide-spread agent network. As more banks join the interoperable mVISA agent network, the convenient and time-efficient features of mHose will probably become more notable for the mHose users. In Table 5 it can be observed that urban and rural clients differed significantly from one another in the reporting of their most important agent problems. Many urban users said that the agent was too far away, which can maybe be explained by the fact that urban clients think they are closer to one of the relatively many branches and EBUs in Kigali, or because urban people can be relatively more spoiled than their rural counterparts. The figure below also clearly reveals that rural people found it more difficult to answer the question.

Figure 16. Encountered problems at the agent
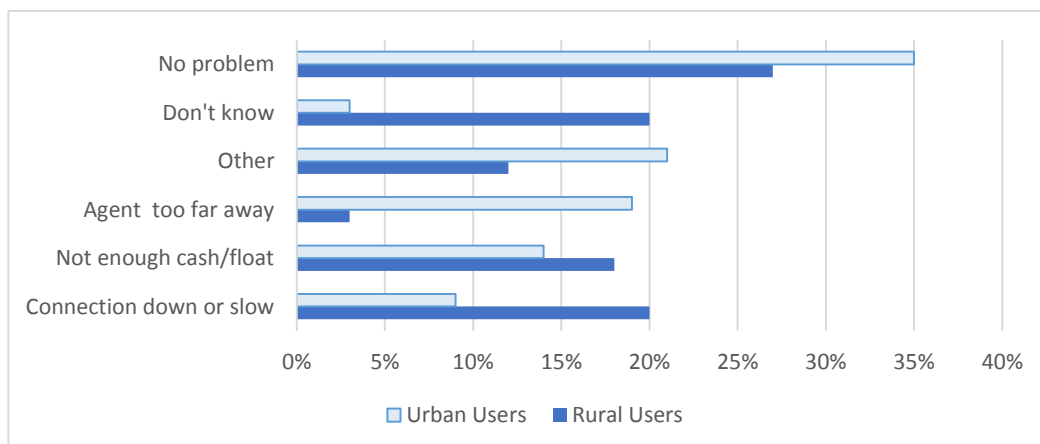
6.3 Security

In the available literature, it is highlighted that technology-enabled financial services can provide great benefits in terms of security. During the FGDs it was clearly communicated that mHose had led to reduced cash handling by clients and lending staff, which was recognized by all as an explicit benefit. Participants strongly felt that overall, their money was safer with mHose. The risk of losing their money (either by accident or theft) when travelling to a transaction point, had gotten smaller. In one FGD, clients revealed that at the end of a market day they would immediately drop that day's earnings at the closest agent and pay their loan on the way home with mHose.

Figure 17. Client perception of safety of money with mHose

SOURCE: TELEPHONE SURVEY, 2014

It was further mentioned that mHose helped prevent clients to suddenly spend their money. Finally, focus group participants also felt that mHose m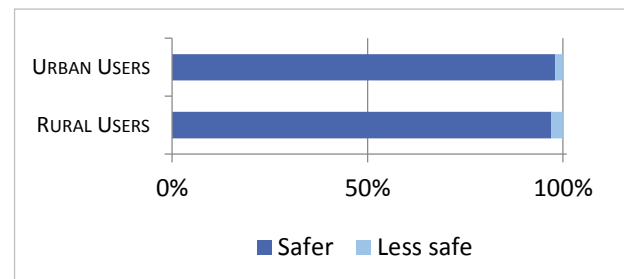ade it more difficult for group members or lending staff to commit fraud or disappear with the group's money. No disadvantages of reduced cash handling were identified in the focus groups.

The telephone survey supports the perception that mHose gives more security to a client's money. In Figure 17 it is showed that 97 per cent of the rural and 98 per cent of the urban users felt their money was safer with mHose. Whether m-banking users lived in an urban or a rural area did not significantly matter in how the clients perceived their money to be more secure (Table 5).

6.4 Financial benefits and costs

Mobile banking can bring both financial benefits and costs to clients. The fewer group meetings – identified as a direct consequence of mHose by the clients and ROs – have resulted in multiple financial advantages for the users. First, in numerous FGDs clients positively spoke about how it had increased the time they could spend on their own business, as it was no longer needed to close their businesses early every week to go and pay their loan. Clients said their businesses consequently improved and their income increased. Second, focus group participants often remarked that it had led to a decreased chance of getting group penalties. These penalties are set by the loan groups themselves and are meant for members who arrive late at meetings or who pay their loan too late. It was further pointed out during one of the FGDs that mHose made it possible to send money to a friend who couldn't pay in time, so that 'late repayment' penalties could be avoided. It should be noted that these penalties are usually rather low, so this benefit is not very substantial. In addition, focus group participants also mentioned that new mHose-related problems (e.g. connection/system issues or difficulties at the agent) sometimes could prevent them from paying their loan on payment day, thereby leading them in arrears with a UOB late payment penalty as result. On the other hand, a financial cost as result of mHose and fewer group meetings is that group leaders now often need to follow up their (defaulting) group members by telephone. It is currently up to the groups how they share these added telephone costs.

Another main financial advantage for m-banking users is the savings on transport costs. The objective of the agent network is to provide closer financial access points to its clients, which means that mHose users no longer need to travel long distances to conduct financial transactions. The effect of this benefit depends on the number of clients that (need to) use public transport to get to these access points. It is unclear how big this financial advantage is, but it can be assumed that as the mVISA agent network penetrates more and more of the remote areas in Rwanda, clients will experience this benefit more strongly.

Instead of giving clients an mVISA eWallet, UOB decided to provide them direct access to a UOB current account (*Teganya account*) through mHose. The moment clients registered for mHose, a bank account was opened. To capture more clients, UOB offers attractive and affordable account features: no minimum deposit or balance, remunerations when balance is over RWF 1,000, no fee on withdrawals at the UOB branch, automatic life insurance for account holders when their balance is more than RWF 50,000, and for two additional family members when the balance is over RWF 100,000 and finally one free balance enquiry and mini statement per day. To date, it has not been necessary to pay out a life insurance to a client. Hence, this financial benefit has not yet been properly felt (UOB, 2012b).

Figure 18. mHose customer fees

Transaction Type	Transaction Size		Fee (Rwf)
	Min	Max	
Send money	1,500	300,000	300
Cash withdrawal at agent	1,500	10,000	275
	10,001	25,000	400
	25,001	50,000	600
	50,001	100,000	900
	100,001	200,000	1,300
	200,001	500,000	2,700
	500,001	1,000,000	5,500
Cash deposit	1,500	500,000	No fee
Pay Loan	1	500,000	No fee
Top-up Airtime	1,500	500,000	No fee
Pay Merchant / Pay Bill	1,500	500,000	No fee
Balance Enquiry / Mini Statement	1st trnx per day is free; then Rwf 50 per trnx		

SOURCE: UOB, NICK MEAKIN AND PÉLAGIE UWIMANA, 2012

Furthermore, UOB has a usage-based revenue model for their m-banking channel, where the fee depends on the size of the transaction. UOB took the demanded prices by other mobile money market players into consideration in their fee framework. During multiple FGDs, clients clearly acknowledged the withdrawal fees as a financial cost, which deterred some clients from making withdrawals at agents and instead visit the branch. However, for many of the other mHose functions UOB did not charge a fee, as can be seen in Figure 18.

During a few FGDs, clients said that mHose encouraged savings. In order to engage clients to go register for mHose, UOB increased the interest rate they paid on the voluntary savings. However, this has not yet led to a real positive effect on the deposits of mHose clients. An analysis of the recent figures even reveal that on average, between the end of January and the end of February 2014, mHose registered clients increased their deposits with RWF 522. In contrary, clients who were not registered for mHose increased their deposits on average with RWF 1,808. Other data confirmed this negative effect of mHose on their propensity to save: between September 2013 and February 2014 there were more mHose clients that had decreased than increased their savings balance. Possible explanations for this can be that UOB has focused more on loan repayments than deposits in their first year, that people often first test the new channel through services that are more accessible like topping-up airtime and that it usually requires quite some time before a client entrusts their money in a new system. Hence, the impact of mHose on the interest earnings of the clients is still trivial (Meakin, 2014).

6.5 Social benefits and costs

Mobile banking can have social benefits and costs. The potential positive effects of mobile phones go far beyond mobile banking. Several clients in the FGDs illustrate this by telling how the introduction of mHose had encouraged them to buy a mobile phone and helped learn them how to use it in their daily lives.

Some other social advantages that clients pointed out in the FGDs included: group members could no longer lie about whether they had already paid or not and the increased transparency about who was responsible for the collected money, had reduced possible confusion within the group about how much money was already collected. The latter advantage made possible theft more difficult, reduced the chance of group disputes and decreased the burden of the group leader and treasurer.

However, the biggest social effect that persistently arose during the FGDs, was the effect of mHose on the number of group meetings, group attendance and group cohesion. Clients gave advantages and disadvantages of having less group meetings. Many focus group participants highly valued the time savings this had brought them and many clients no longer saw the reason why they had to come to the group meetings, if they already fulfilled their loan repayment obligations with mHose. Nonetheless, most clients agreed that the fewer group meetings had resulted in an increased number of defaulters within the group, who at the same time were more difficult to reach by phone in order to force commitment. It was further emphasized by the clients that the attendance of fewer group meetings resulted in less knowledge amongst the group members about occurring group problems, less control of the group payments due to this reduced knowledge about each other's situation and finally less respect from the members for the agreed group rules. The ROs confirmed these negative effects that the greater absenteeism of members increased their chance of defaulting, and talked about the difficulty they experienced to motivate clients to come to the meetings, as some group members would even try to skip those monthly gatherings. They stressed that clients then no longer benefitted from the social interaction with other group members, where commonly thoughts and experiences are shared and lessons learnt. The ROs had experienced how social pressure no longer worked and clients starting to behave as individual clients, thereby feeling less solidarity towards their own group members. This increased individuality, reduced amount of group meetings and loss of control of the groups, contributed in the eyes of some ROs to the 'destruction of the groups', and sometimes the loss of 'good clients'. However, the telephone survey did not confirm a significant difference between mHose users and non-users in the number of times that they had attended a group meeting in past four weeks:

Table 4. Attendance of group meetings by mHose users and non-users (2014)

	User (N = 119)	Non-User (N = 120)	Test for Equality[a]
Ratio variables			
No. of attended group meetings in past 4 weeks	1.53	1.39	1.015
	(1.00)	(1.09)	

Notes: [a] T-test for equality of means for ratio variables;
Robust standard deviations in parentheses

In addition, no significant difference was found between urban and rural mHose users. This is shown in Table 5.

6.6 Customer service experience

Finally, people will use the m-banking service more (extensively) if they are satisfied with the customer service experience. Since the introduction of new technologies generally requires some familiarization by the users, UOB set up a Call Centre to offer assistance to the mHose users and mHose agents.

Clients in the FGDs were divided in their assessment of UOB's mHose customer service. In one FGD, clients stressed that the Call Centre was difficult to reach because the lines were occupied and that the Call Centre didn't provide sufficient explanations to their questions. The telephone survey showed that 56 per cent of the urban and 40 per cent of the rural users had contacted the Call Centre one or more times. This is shown in Figure 19. Of these two groups that had contacted the Call Centre, 85 and 68 per cent respectively stated that the assistance had resolved all their issues (Figure 20). There appeared to be no significant difference between the urban and rural mHose registered users that had called the Call Centre, nor any significant difference between the urban and rural users in their view if the Call Centre had resolved all their problems.

Figure 19. Percentage of users that called the Call Centre since registering for mHose
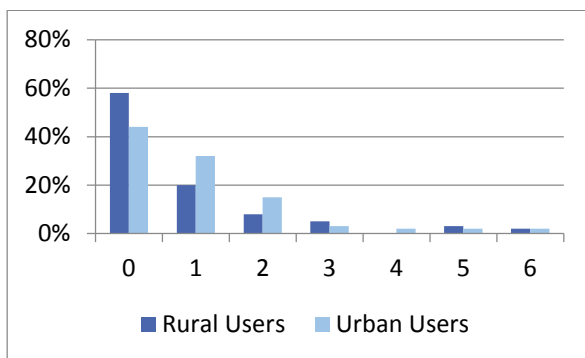
SOURCE: TELEPHONE SURVEY, 2014

Figure 20. Perceptions of mHose users who called the Call Centre on the outcome of their calls
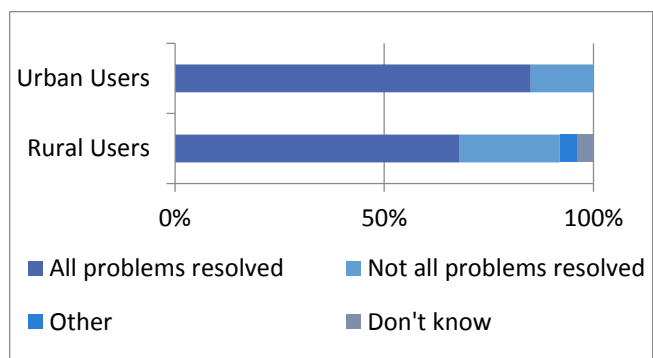
SOURCE: TELEPHONE SURVEY, 2014

With mHose, UOB has acquired a network of agents that are representing the bank towards their clients. Even though it is more difficult to ensure that these agents provide a good customer service to the mHose clients, it is important that UOB invests in the proper training of these agents. The lending staff pointed out that some clients had complained about the lack of attention they had gotten from agents or that agents prioritized the clients of their original business, choosing to leave the mHose clients waiting.

Figure 21. Reasons why non-users don't use mHose (anymore)
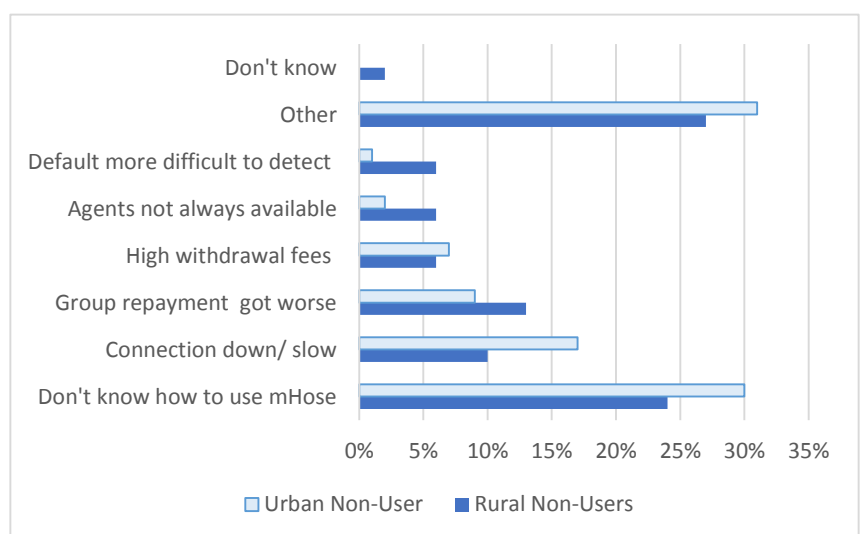
SOURCE: TELEPHONE SURVEY, 2014

The telephone survey asked 120 mHose non-users 'why they didn't use mHose (anymore)?'. Their answers can be found in Figure 21. Most arguments indicate problems with the user-friendliness or training, connection issues and worsening group repayments. These issues require attention from UOB, but since this study was done just one year after the introduction of mHose, it is expected that there are issues that need improvement.

Table 5. Statistical analysis on the differences between urban and rural mHose users

	Urban	Rural	Test for Equality[a]
Ratio variables			
No. of attended group meeting in past 4 weeks	1.60	1.95	-0.680
	(0.89)	(3.88)	
N	60	59	
Total times Call Centre was contacted	0.98	2.212	1.161
	(1.27)	(7.54)	
N	59	60	
Nominal variables			
% that has used mHose to deposit cash on Teganya account	98%	95%	1.034
% that has used mHose to pay loan + obligatory savings	98%	97%	0.342
% that has used mHose to send money	25%	18%	0.786
% that has used mHose to pay bills	17%	15%	0.063
% that has used mHose to top-up airtime	35%	23%	1.976
Location deposit of cash on Teganya account in past 4 weeks			6.90**
% of users that deposited cash at the agent	40%	60%	
% of users that deposited cash at the branch	50%	38%	
% of users that deposited cash at the group leader or treasurer	10%	2%	
N	60	60	
% of users where the agent was closer than the group meetings	36%	46%	12.187***
N	59	59	
% of users where time spent to conduct a financial transaction had decreased	82%	83%	0.039
N	60	59	
Most encountered problems with mHose on phone			0.788
% of users reported network/connection problems	57%	59%	
% of users reported other problems	18%	11%	
% of users didn't have a problem	25%	19%	
N	59	60	
Most encountered problems at agents			18.461***
% of users reported network/connection problem	9%	20%	
% of users reported 'out of cash'	14%	18%	
% of users reported 'too far away'	19%	3%	
% of users reported other problems	21%	12%	
% of users said they didn't know	3%	20%	
% of users didn't have a problem	35%	27%	
N	58	60	
% of users that felt their money was safer with mHose	98%	98%	0.000
N	60	59	
% of users of whom the Call Centre resolved all their problems	85%	73%	1.212
N	33	22	

Notes: [a] T-test for equality of means for ratio variables; Chi-Square test for nominal variables

Robust standard deviations in parentheses

** Coefficient significant at 5 per cent or less *** Coefficient significant at 1 per cent or less

6.7 Summary

This chapter has showed that the mobile banking channel of UOB has brought costs and/or benefits to mHose users. In Table 6 below, an overview is presented of the costs and benefits that were discussed above. Again, it is important to note that the focus groups did not constitute a random sample and therefore no general conclusions can be drawn from their comments.

Table 6. The effects of mHose for the clients

Accessibility	Increased	Decreased	No effect
Access for existing clients to existing financial services	X		X
Access for existing clients to additional financial services	X	X	
Access for new clients to financial services	X		
Time savings and convenience of access	**Increased**	**Decreased**	**No effect**
Ease of accessing financial service points	X		
Travel time		X	X
Convenient location for loan repayment transactions	X		
Convenient location for cash transactions	X		X
Time spent per cash transaction	X		
Flexibility on when to transact	X		
Transparency of information on account balance	X		
Transparency of information on loan repayment	X	X	
Security	**Increased**	**Decreased**	**No effect**
Safety from being robbed or losing money	X		
Safety from fraud or theft by group members or ROs	X		
Safety from one self	X		
Net financial benefits	**Increased**	**Decreased**	**No effect**
Time for doing business	X		
Transport costs savings	X		
Savings on penalties for arriving late at meeting	X	X	
Savings on penalty interest (for delinquents)	X		
Interest on savings	X		
Insurance coverage	X		
Affordability of transactions	X	X	
Savings on telephone costs (for group leaders)		X	
Net social benefits	**Increased**	**Decreased**	**No effect**
Learn how to use mobile phone and social connectedness	X		
Peace and trust among group members	X		
Transparency about who is responsible for the money	X		
Social cohesion	X	X	
Loan repayment rate of group		X	
Ease of getting defaulters to commit		X	
Awareness of group problems amongst group members		X	
Opportunities for social interaction and group dynamics		X	
Customer service experience	**Increased**	**Decreased**	**No effect**
Availability of customer call centre	X	X	
Quality of provided assistance by the call centre	X	X	
Availability of agents	X	X	
Quality of provided service by the agents	X	X	

Source: PHB Development data, 2014

7. Discussion and Limitations

The initial research goal was to study the effect of m-banking on financial inclusion. The focus should have been on discovering the differences between m-banking users and non-users, in client profile, their access to financial services and usage of these services. Especially the benefits, costs and barriers of standard banking would have been compared to the benefits, costs and barriers of m-banking. Followed by an investigation into a possibly more frequent use of financial services and the range of services used.

A key requirement for this would have been to also have information on (registered) non-users. As the field research was made possible through an assignment[30] that the consultancy firm PHB Development was conducting in Rwanda for Triple Jump Advisory Services (TJAS), there was limited time and space to prepare and add my additional questions or broaden the target group.

On arrival, it became clear that the mHose financial service is actually still too new to analyse the real effects of the m-banking on clients and financial inclusion. In addition, mHose was first introduced with mainly loan group clients, which inherently meant that most clients already had access to formal financial services. UOB's strategy was to subscribe all their customers for the m-banking service. Loan groups and new clients automatically received a mHose registration form when registering at UOB. Registering financially excluded population segments in Rwanda, which would have been the most interesting segment to study for this thesis, can only get attention at a later stage.

The mHose client database is sizeable in many ways, but allowed a client profiling on only three indicators: geographical location, gender and age. Even though the mHose registration forms contained fields for the collection of data on other indicators that could affect mHose activity (like education, income level, employment status, marital status), the completion of these fields is not mandatory. As a result, for many clients this information is missing and could thus not be incorporated into the profile analysis. If and when UOB would make these indicators mandatory, a more complete profile of the mHose users and non-users will be possible and UOB will be better able to target the non-users.

For the qualitative interviews, the sample also had limitations. First, since mHose is a relatively new start-up that is following a certain roll-out pattern (the 'good' loan groups first), its users are not evenly distributed throughout Rwanda yet. It is possible that the people in the areas where mHose was rolled-out first, use the service more. Second, it is reasonable to expect that the poorest population segments were not included in the sample. Possible causes can be that they may have an own SIM card but do not own a mobile phone, they may be more resistant to answer a call from an unknown number or that they are more inclined to reside in areas with poor network coverage. Due to time limitations, it was decided to only acquire quantitative data of the mHose registered clients and divide this pool into

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[30] Furthermore, I was lucky to join the mission as a trainee. However, it required me to focus primarily on the PHB assignment, which had a full schedule for the two weeks assigned. Additional work for this thesis could only be done in the margin of the assignment. I also received the official green light a 1,5 week before departure, limiting further the possibility for preparing questions or getting any other data that was more targeted to my thesis topic.

m-banking users and non-users. It was expected that most users and non-users would have (access to) a mobile phone and therefore be easier to reach during the telephone survey. In addition, as mentioned in the research methodology, mHose is relatively new and UOB wanted all their clients to register for it. As a result, it was assumed that the mHose registered non-users, on which data has been collected, is similar to the overall non-using clientele of UOB.

Furthermore, the results cannot be extrapolated to all m-banking users in Rwanda or elsewhere. Findings are specific for every m-banking deployment and each country. Due to unforeseen circumstances, the focus group participants were not a representative sample so these results cannot even be extrapolated to all the mHose registered clients. It would be interesting if more FGDs would be held with a representative sample to ensure that there are no differences in the qualitative data presented here. Regarding the quantitative data, the approximation of the poorer and richer population with, respectively, rural and urban people was known to be far from ideal, even upfront. This contributed to the largely inconclusive quantitative tests. It would be useful to adjust the questionnaire for the mHose non-users so that it better concurs with the questions for the mHose users, thereby allowing a better and more in-depth analysis on the differences between users and non-users. This was my initial intent, but the acquired results mainly permitted me to do an analysis on the differences of urban and rural m-banking users in their assessment of the benefits, costs and barriers of mHose. In hindsight, my initial plan was quite broad and I expected to gather certain information more easily.

While keeping in mind the reservations mentioned above, the outcomes of the field research nevertheless provide some directional indications that the mobile money scheme in Rwanda is fulfilling a demand for financial services, mainly among the poor. It seems almost unavoidable that the lower barriers and costs eventually will lead to more financial inclusion.

8. Conclusion and Recommendations

This thesis has done an explorative study into the mobile banking deployment of mHose in Rwanda. An extensive literature review was performed to lay the basis for looking at the Rwandan case. The first sub-question of this thesis required an analysis on the client profiles of mHose users and non-users. It is important to note that UOB is pressing their clients in registering for mHose, with the result that many clients registered, without actually using the service. The findings of the client profile analysis showed that group clients that used mHose tended to be urban, female and an average age of 36 years old; while their non-using counterpart tended to be rural, female and an average of nearly 37 years. Compared to the general profile of the unbanked population in Rwanda, it can be concluded that m-banking (group) non-users don't differ on location and sex. However, non-users did fall within the age range that has the biggest chance of being financially included. This can be explained by the fact that non-users already had financial access to a formal institution, namely a micro-finance bank. Finally, as far as individual m-banking users as well as non-users is concerned, their profile is quite similar and belong to a group of males around 30 years old that is already considered to be largely financially included, making them less interesting to research. It is recommended that providers of mobile banking procure more socio-demographic data of all their clients to develop a more in-depth understanding of their customers, and accordingly adjust their m-banking product to their financial needs.

This thesis has also attempted to research, as part of the second sub-question, if clients acknowledge the features of convenience, efficiency and security of m-banking, which should positively affect the degree of financial access in Rwanda. The gathered qualitative and quantitative data has shown that mHose clients highly value the time savings and the security of their money, that came with mHose. It is useful to bear in mind that clients may find these type of features more important than having an actual bank account. The results further showed that in approximately one year mHose has increased the total number of financial access points in Rwanda with 229 locations, through their agent network. This is not even considering all the mVISA agents installed by the other banks that have joined the interoperable mVISA agent network. Consequently, 3253 new clients joined UOB and the mHose service between March 2013 and February 2014. The socio-demographic profile of these clients was unfortunately not available, which prevented an insight in the financial inclusion question whether mHose is reaching the unbanked population segments.

However, in the academic literature (Demirgüç-Kunt and Klapper, 2012b; Beck, Demirgüç-Kunt and Peria, 2007) a positive and significant relationship is found between the number of access points and financial inclusion, as well as between the access to financial services and the economic development within a country. It is also argued that financial development of the low-income and rural population, through increasing the access to financial services, can help decrease the continuous income inequality gap in African countries, in particular between urban and rural areas (Batuo, Guidi and Mlambo, 2010). An m-banking product like mHose that greatly increases the number of financial access points throughout a developing country, can be a good tool to reach the remote and rural areas – where poverty is concentrated – and stimulate financial development. In light of the existing financial inequality gap between urban and rural areas, this thesis has tried to discover if the urban and rural m-banking users have different perceptions of the costs, benefits and barriers that UOBs' mHose service has brought them. This was addressed under the third sub-question in this thesis. The findings

in Table 5 show that rural dwellers significantly benefit from reduced distances to the closest financial access point, thanks to mHose and its agent network. This is not surprising, as urban dwellers are less confronted with the problem of distance.

Access to credit is critical for the poor, as it allows them to make investments (like in the education of their children or their small-scale businesses), adequately respond to shocks and save. The m-banking product of UOB has made loan repayments easier for its users, and with the mHose service UOB is now offering its users a free life insurance. However, under the fourth sub-question, this thesis revealed that mHose has had a negative effect on the propensity to save, whereas savings are fundamental in mitigating risks and promoting investments. Hence, continuous education of clients in the benefits of savings is essential. It was also showed that both clients and Relationship Officers in the focus group discussions believed that the introduction of mHose had a negative effect on how often clients attended their loan group meetings every four weeks and consequently how this negatively affected the group cohesion and the on-time loan repayments, and hence access to follow-up loans. These issues could possibly be explained by the fact that clients no longer had the obligation to go to every weekly meeting, they no longer saw the need to go the meetings since they paid their loan from home and they especially didn't see the use of coming if their loan repayments were due after the meeting. However, the telephone survey did not find that mHose users and non-users attended a significantly different number of group meetings in four weeks. The majority of both users and non-users went to one group meeting a month. Research on group methodology (Feigenberg, Field and Pande, 2010; 2013) has showed the importance of social interaction and group cohesion on the loan repayments of clients, but it also showed how cooperative behaviour is facilitated outside the meetings and social capital. The effect of monthly meetings on the *Portfolio at Risk* (PAR) should be closely monitored.

The findings further showed that clients recognised many problems with mHose that had to do with the service not (yet) functioning as it should be. The frequent connection problems and the incorrect content and timing of the reminding text messages were the leading problems. An explanation why connection problems were reported as often, might also be that less educated people can quickly assign problems they don't understand to connection issues.

Overall, the main research objective of this study, regarding the effect of mobile banking on financial inclusion could only be partially answered with the data from the field research, as insufficient information has been obtained from the non-banked Rwandan population.

In the literature review, it was discussed that mobile banking can either have transformational or additive services. To date, mHose has primarily served as an extra banking channel that brings convenience to UOB's existing customers, and therefore the effect of mHose on achieving greater financial inclusion has so far remained additive. This can partially be explained by the fact that mHose was only introduced by UOB in February 2013, a little bit more than one year before this research was conducted. In this first year, the focus of UOB had been on the rolling-out of the agent network, the training of the staff and subsequently the clients, the proper functioning of the system and back office processes and other technicalities that pop up in the early stages of developing a new technological and financial product. Even though this thesis has not clearly found that mHose has been able to expand their reach to the unbanked Rwandan population, the qualitative data does confirm the potential of mHose to expand financial inclusion.

The fact that mHose is being launched by UOB, a microfinance bank, gives the m-banking service more potential to become transformational in the future, and extend financial services to segments of the population who could never be reached before with the traditional brick and mortar branches. An MFI is more adapted to the poorer segments of the population and offers products that are more in line with the financial needs of the low-income base. A financial institution like UOB can go beyond offering the main mobile money services of transferring money and making payments. In addition, the more personalized service of MFIs and their accessibility can help gain the trust of the poor more easily, especially when introducing a new technological product. This is important as especially in new markets, trust has an effect on the customer adoption rate. In addition, recent research (Feigenberg, Field and Pande, 2013) has shown the important role of MFIs in building social capital and stimulating social interaction, which in turn positively influences the level of default and economic development.

If UOB wants to exploit the potential of mHose, they will need to actively roll out their agent network to the most rural and remote areas in Rwanda and offer their financial services there. It will first be important that the bank resolves all their personnel and operational issues. Second, it will be useful if they develop strong partnerships with institutions that are represented in these isolated areas and who can help them build a solid financial foundation. Third, during field research it became clear that UOB's lending staff as well as the clients require more training in mHose and more awareness of all the available financial options. Fourth, to ensure a higher financial inclusion rate, UOB will need to market their mHose service more and better, especially in the rural and remote areas. Fifth, it will be useful if UOB tries to find ways how they can make mHose more accessible to the weakest segments, like voice-operated menu's for the financial illiterate or the use of symbols. With more competitors entering the market of mobile banking, innovation and a better targeting of the currently unserved population will become important for UOB, and simultaneously beneficial for the future customers. Finally, to build upon the results that were presented in this thesis, it will be interesting if UOB would do another quantitative and qualitative research in two years in order to determine how the effect of mHose has developed, and especially towards the unbanked Rwandan population.

On a positive note, both urban and rural mHose users (95 and 97 percent respectively) indicated in the telephone survey that UOBs' m-banking product had made their lives easier, and nearly all of them were willing to recommend mHose to their friends and family.

Mobile banking is a highly interesting and dynamic technological development, creating substantial potential for higher financial inclusion in African countries. Further academic research is required to prove unequivocally that this potential is realized.

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Annex A. List of Persons Interviewed

UOB	Position
Nick Meakin	Director of Project Management
Andrew Tushabe	Agent Network Manager
Grace Mukashyaka	Agent Banking Assistant
Ivan Kamali	Call Centre Agent
Jael Ikirezi	Head of Call Centre
Orren Niyongabo	EBU KSW (Kigali-West, Southern and Western Province) Division
Sarah Busingye	mHose Implementation Officer

Annex B1. Focus Group Discussion Guide Clients

UOB Client Focus Group Discussions on mHose

17-20 March 2014

Facilitator Guide

Introduction

1. **Who we are**

    a. **Sarah – Facilitator from UOB**

    b. **Grace – Minute taker from UOB**

    c. **Pete – Consultant for PHB Development**

    d. **Sophie – Student doing research for her Masters' thesis**

2. **Why we're here:**

    a. **UOB management wants to improve mHose**

    b. **It has asked us to find out the advantages and disadvantages for you**

    c. **It has also asked us to find out your ideas for improving mHose**

3. **What we're going to do:**

    a. **4 group exercises using visuals to help discussion**

        i. **First exercise about deposit and withdraw cash with mHose**

        ii. **Second about saving through mHose**

        iii. **Third about paying your loan through mHose**

        iv. **Fourth about what you want to see improved**

    b. **Total 1.5 hours**

    c. **Some sodas halfway**

4. **Rules: please….**

    a. **Put phones on silence**

    b. **Speak up, because UOB want to know your opinions**

    c. **Everyone contribute, so UOB understands not everyone wants the same**

   d. **Speak one at a time, so we can note down what you say**

 5. **While we will write a list of names, we will not write who said what. This is to make sure that you can say your real opinion without anyone knowing you said it.**

Breaking the ice

Ask clients to tell something about themselves. Make sure they include:

 1. **Their names**

 2. **The group they belong to**

 3. **The RO with whom they work**

 4. **Whether they have or have not used mHose**

Registration list

Ask ROs to complete registration list and then leave the Focus Group.

Name	Group	Relationship Officer	Used mHose Yes/No

 ➢ **Exercise 1: Client understanding of cash deposit and withdrawal**

Explain that we want to find out what they know, what they do and why they do it.

Ask:

 1. **What are the different places where you can deposit or withdraw cash?**

Present a large sheet of paper and draw client in the middle. Use small sheets of paper to represent:

 - **Location where group meetings have taken place**

 - **Different agents**

 - **Branch**

 - **Any other places they can deposit cash**

Ask participants to stick the small sheets of paper on the large one, with nearby locations near the client on the map, and far away locations further from the client. Do not attempt to estimate distances – all that matters is closer by or further away.

Ask:

 2. **How can you deposit cash on your Teganya account?**

 3. **How can you withdraw cash from your Teganya account?**

Make sure people describe the process at the group meeting, the branch (if relevant) and the agent. Draw different forms around the group meeting and the branch, and two telephones near an agent on the map. Use them to probe about the process.

Make careful notes. Make sure to distinguish between misunderstandings of the processes on the side of the clients, and changes to the processes that may have been made by local UOB staff.
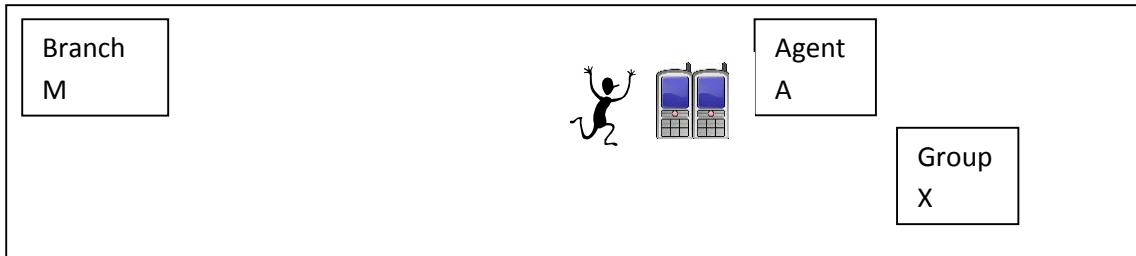
> ➤ **Exercise 2: Client opinions and behaviour around savings**

Explain that saving through mHose has pros and cons, and that we understand that some people choose to use it and others choose not to.

Explain that we will now try to list the advantages and disadvantages of mHose. Present a large sheet of paper and fold it in half. Write on top a Plus and a Minus sign.

Ask:

4. **What are the advantages of depositing and withdrawing cash through mHose?**

    - **Probe to find out:**

        o **Advantages of saving on a Teganya account with or without mHose**

        o **Advantages of saving more than 50,000 on a Teganya account using mHose**

5. **What are the disadvantages of depositing and withdrawing cash through mHose?**

    - **Probe to find out:**

        o **Awareness of financial costs**

Draw visuals to represent advantages and disadvantages, but also write. For example:

- **Little coins to represent costs**

- **Little coffin to represent funeral insurance**

- **Clock to indicate time savings**

At the bottom of the page, indicate problems that cause mHose not to work as it should.

Pros and cons for clients of depositing and withdrawing cash through mHose	
+	-
Can be done at any time	Costs money to withdraw cash
Problems	
Agent doesn't always have cash	

Animate a discussion and make careful notes.

Ask:

6. **Who has used mHose to deposit on or withdraw cash from their Teganya account?**

Encourage a show of hands and take note of who has and who hasn't used mHose for savings.

Ask:

7. **Would any of the people who are not using mHose like to tell us why they haven't used it?**

Make careful notes. Make sure to distinguish between reasons based on the advantages and disadvantages listed earlier, and reasons that have to do with mHose not working as it should.

Offer sodas.

➢ **Exercise 3: Client opinions and behaviour around loans**

Explain that paying loans through mHose has pros and cons, and that we understand that some people choose to use it and others choose not to.

Explain that we will now try to list the advantages and disadvantages of mHose. Present a large sheet of paper and fold it in half. Write on top a Plus and a Minus sign.

Ask:

8. **What are the advantages of paying loans through mHose?**

   - **Probe to find out:**

       o **Advantages of paying at any location and any time**

- o **Advantages of less group meetings**

9. **What are the disadvantages of paying loans through mHose?**

   - **Probe to find out:**

     - o **Disadvantages of paying at any location and at any time**

     - o **Disadvantages of less group meetings**

Draw visuals to represent advantages and disadvantages, but also write. For example:

- **Little coins to represent costs**

- **Little people to represent group meeting**

- **Clock to indicate time savings**

Pros and cons for clients of paying loans through mHose	
+ Can be done at any time	- Less group meetings
Problems Agent doesn't always have cash	

Animate a discussion and make careful notes.

Ask:

10. **Who has used mHose to pay loan?**

Encourage a show of hands and take note of who has and who hasn't used mHose for paying loans.

Ask:

11. **Would any of the people who are not using mHose like to tell us why they haven't used it?**

Make careful notes. Make sure to distinguish between reasons based on the advantages and disadvantages listed earlier, and reasons that have to do with mHose not working as it should.

On the big sheet of paper, make a separate list of problems that cause mHose not to work as it should.

> ➢ **Exercise 4: Client needs and priorities**

Explain that we want to know what UOB needs to change to make more people use mHose.

Place the large sheets of paper of the last two exercises on the floor and ask:

12. What do you like most about mHose?

Using bottle tops, rank the advantages. Use 6 tops for advantages that are considered important and 4 tops for advantages that are less important.

13. What do you think UOB should change?

Using bottle tops, rank the greatest disadvantages and the problems that cause mHose not to work as it should. Use 1 top for disadvantages and problems that are important and 3 tops for disadvantages and problems that are not so important.

Animate a discussion around clients' ideas for improvements. Take careful notes.

Thank clients for their time and their contributions.

Annex B2. Participants in Client Focus Groups

▪ **Rural Participants in Client Focus Groups**

Names of Clients	**Location**
Abduru Hakizimana	Musanze
Anonciata Namahirwe	Musanze
Beatrice Akimanizanye	Musanze
Donathile Nyiranizeyimana	Musanze
Fatuma Dusabe	Musanze
Irena Dusabimana	Musanze
Jean de Dieu Ruremesha	Musanze
Laurence Nyiranzabandora	Musanze
Lucie Nyirarukundo	Musanze
Mariam Ingabire	Musanze
Sebastien Barasebwa	Musanze
Semahoro Ndanyuzwe	Musanze
Theodosie Nyirabunane	Musanze
Venantie Nyirandatwa	Musanze
Veneranda Muhawenimana	Musanze
Angelique Nyirangendahimana	Cyanika
Consolee Uwamahoro	Cyanika
Daniel Nkunzurwanda	Cyanika
Donatha Nyirandimukaga	Cyanika
Donathille Mukanoheri	Cyanika
Elizabeth Mukandayisenga	Cyanika
Eric N.Sebisogo	Cyanika
Esperence Nyirabunane	Cyanika
Faustin Nyemera	Cyanika

Francoise Bamurange	Cyanika
Gloriose Mukundente	Cyanika
Immaculee Mukangwije	Cyanika
Jean Bosco Hagumimana	Cyanika
Jeannette Ingabire	Cyanika
Marie N.Mkundabera	Cyanika
Providence Twambazimana	Cyanika
Ruth Bemeriki	Cyanika
Vestine Ayinkamiye	Cyanika
Vestine Nyiragumusha	Cyanika
Wensislas Nizeyimana	Cyanika
Cartas Nyirampagazekubwayo	Ruhuha
Damascene Uwingabiye	Ruhuha
Francine Mukerabirori	Ruhuha
Gahonziri Bimenyimana	Ruhuha
Jeanne Manirahari	Ruhuha
Lusie Dusabimana	Ruhuha
Nepomscene Rutayisire	Ruhuha
Peruth Dusabimana	Ruhuha
Selemane Munyensanga	Ruhuha
Vayisi Niyikiza	Ruhuha
Vestine Mukankusi	Ruhuha
Vestine Mukarwego	Ruhuha

- **Urban Participants in Client Focus Groups**

Names of Clients	**Location**
Pierrine Mutoni	Kigali-East
Theogene Hagenimana	Kigali-East

Theresse Mukabadege	Kigali-East
Vestine Mujawamaliya	Kigali-East
Vestine Murererehe	Kigali-East
Xxx Mukagilimana	Kigali-East
Yvette Nyiraruhanga	Kigali-East
Agnes Mutamuliza	Kigali-West
Angelique Uwizeye	Kigali-West
Brigitte Beneguheka	Kigali-West
Celestin Uwamurengera	Kigali-West
Chadia Uwimana	Kigali-West
Chantal Mukangarambe	Kigali-West
Christine Umutanguha	Kigali-West
Clarisse Uwamahoro	Kigali-West
Clementine Nyirampabuka	Kigali-West
Elie Ndikumana	Kigali-West
Julienne Ayinkamiye	Kigali-West
Olgene Habineza	Kigali-West
Patricie Musabeyezu	Kigali-West
Patricie Ntakirutinka	Kigali-West
Protais Bunani	Kigali-West
Redempta Tuyizere	Kigali-West
Sandrine Mukamazimpaka	Kigali-West

Annex C1. Focus Group Discussion Guide Relationship Officers

UOB Relationship Officer Focus Group Discussions on mHose

17-20 March 2014

Facilitator Guide

Introduction

1. **Who we are**

    a. **Sarah – Facilitator from UOB**

    b. **Grace – Minute taker from UOB**

    c. **Pete – Consultant for PHB Development**

    d. **Sophie – Student doing research for her Masters' thesis**

2. **Why we're here:**

    a. **Triple Jump, a funder, wants to help UOB management assess the benefits and costs of mHose**

    b. **It has asked us to find out the advantages and disadvantages for relationship officers and clients**

    c. **It has also asked us to find out your ideas for improving mHose**

3. **What we're going to do:**

    a. **3 group exercises using visuals to help discussion**

        i. **First exercise about how mHose has changed your tasks**

        ii. **Second about the advantages and disadvantages of mHose for you**

        iii. **Third about why you think clients use or do not use mHose**

    b. **Total 1.5 hours**

    c. **Some sodas halfway**

4. **Rules: please….**

    a. **Put phones on silence**

   b. **Everyone speak up, because we want to know your opinions**

   c. **Speak one at a time, so we can note down what you say**

Breaking the ice

Ask ROs to tell something about themselves. Make sure they include:

1. **Their names**

2. **The EBU they belong to**

3. **The number of groups they manage**

4. **The number of their groups that have been partially or completely registered for mHose**

Ask ROs to complete registration list while you continue with the introductory questions

Name	EBU	No. of groups	No. of groups registered for mHose

Introductory questions

Ask ROs to describe a typical day.

- What do you do in the morning?

- What do you do at lunch time?

- What do you do in the afternoon?

Ask whether there are days that are different, and how they differ.

You may ask probing questions, but do not suggest any answer. We want them to only mention the tasks they consider important, not the ones they should be doing.

> ➤ **Exercise 1: RO tasks under mHose**

Explain that we would like them to tell us how four processes have changed for them:

- Their tasks in registering existing group clients

- Their tasks in registering new group clients

- Their tasks in helping clients make and withdraw deposits

- Their tasks in helping clients pay and recover loans

Present 4 large pieces of paper and a number of smaller pieces of coloured paper in the shape of rectangles (20) and diamonds (10). Demonstrate the system for creating process maps by being

actively involved in the production of the first map. Then let them complete the other process maps themselves.

Use the following elements:

- Rectangle: Task

- Diamond: Decision

- Arrows: To link tasks and decisions

Below is an example of what the resulting process maps should look like. Please note that this example mixes two of the above-mentioned processes (registering existing and new group clients). We will instead create two separate diagrams.
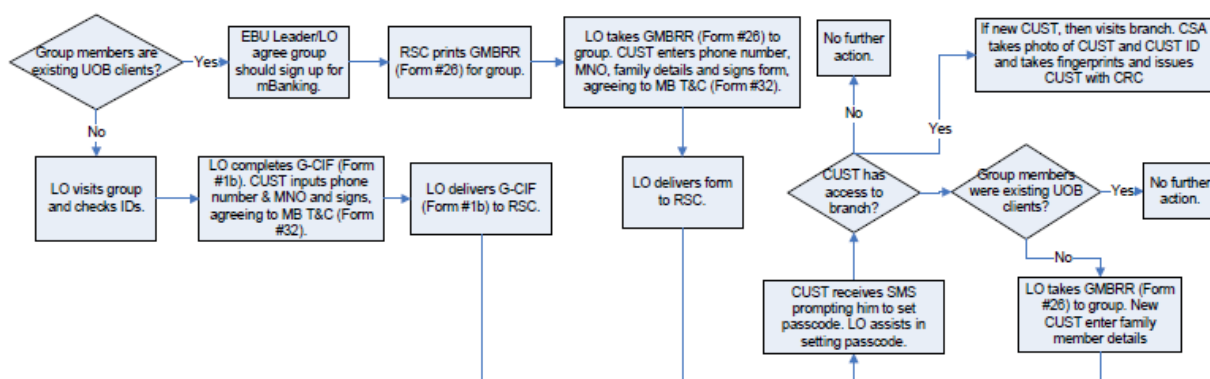
It is important that the process reflects the RO's understanding, NOT the ideal process.

The purpose of this exercise is NOT to get the process right. The purpose is to create a picture that stimulates discussion about how the new processes have changed ROs' lives.

While making the process maps, ask the following probing questions:

- How are tasks different from before mHose was introduced?

- How are tasks different for different types of clients?

  o urban/ rural

  o men/women

  o literate/illiterate

- What are the principal problems in executing the processes as mapped?

Make careful notes of all remarks regarding the processes and the answers to the probing questions.

Offer sodas.

➢ **Exercise 2: Advantages and disadvantages of mHose for ROs**

Remind them that they have had training on the supposed advantages and disadvantages of mHose. We would like to know what they think are the real advantages and disadvantages of mHose on the

ground, if it were to work as it should (i.e. if everyone did what they were supposed to do and there were no technological problems).

Present a large piece of paper folded in two to create a line in the middle. Write on top: Advantages and disadvantages. Make a category at the bottom for problems that prevent the advantages from materialising.

Facilitate a brainstorm on advantages and disadvantages. Whenever ROs mention a disadvantage that is not due to mHose but rather to mHose not functioning as it should, write it at the bottom.

While making the list, probe to know:

- To what extent, and why, has mHose increased / decreased time spent on the different tasks related to group formation, loan monitoring and recovery?

- To what extent, and why, has mHose reduced / freed up time for other RO tasks? These include:

    o Transformation

    o Formation of new groups

    o Recovery of loans

    o Mobilisation of savings.

- To what extent has mHose changed their motivation and enjoyment of their job?

After making the list, ask ROs to rank:

- The top three advantages in order of importance by indicating 1 (most important) to 3 (least important).

- The top three disadvantages in order of importance by indicating 1 (most important) to 3 (least important).

Pros and cons of mHose for ROs	
Advantages	**Disadvantages**
1 Less time spent on facilitating group meetings	*3* More time spent on chasing repayments
Problems	
A lot of time spent on helping clients set their mPin	

Make careful notes of all remarks regarding the processes and the answers to the probing questions.

➢ **Exercise 3:** **Drivers and obstacles for clients**

Remind ROs that two of UOB's management's goals of mHose are to facilitate loan repayments and to encourage savings.

Present a large piece of paper and draw two circles, one with Pay Loan through mHose in the middle and one with Save Extra through mHose in the middle. Ask ROs

- What do you think determines whether clients use mHose to pay loans?

- What do you think determines whether they make extra deposits beyond obligatory savings?

Have ROs write each factor on a piece of coloured paper and stick it on the large piece of paper. Then draw an arrow from the factor to the element it influences (repayment or savings).
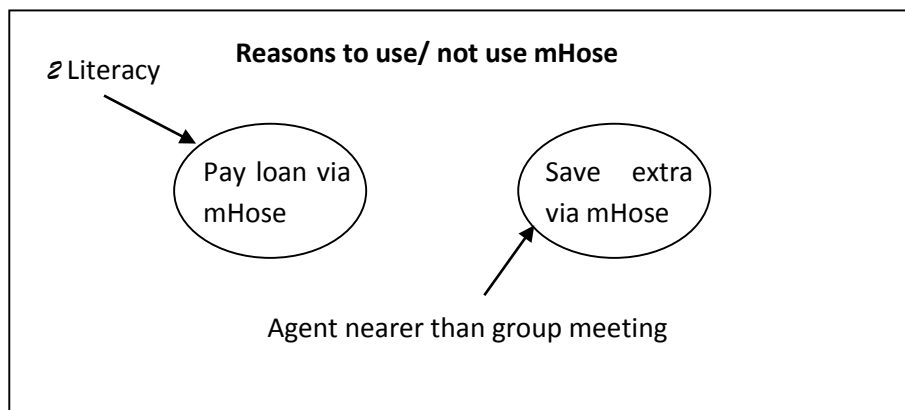

Discuss with ROs the extent to which each factor prevents clients from using mHose. Ask ROs to rank the factors in order of importance by indicating 1 (most important) to 3 (least important).

Ask ROs:

- To what extent do you feel mHose has improved portfolio quality?

- To what extent do you feel mHose has increase the value of voluntary savings?

In each circle, draw a bar graph representing what they think has happened so far to the portfolio quality and the volume of voluntary deposits of people who have started to use mHose.
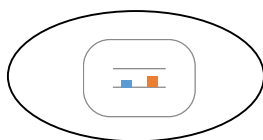

Finally, ask ROs:

- What could be done to make mHose more useful for you in achieving transformation, a greater portfolio, better portfolio quality and more savings.

- Make careful notes of all comments and observations.

Annex C2. Participants in RO Focus Groups

Name	Location
Bonheur Nbafizete	Musanze
Bonheur Runeterwa	Musanze
Chantal Nzamukosha	Musanze
Egide Ndayisaba	Musanze
Jacques Mudakikwa	Musanze
Jean de Dieu Kiruhura	Musanze
Jean-Claude Nkurunziza	Musanze
James Kambanda	Kigali-East
Restituta Nyirakabibi	Kigali-East
Valens Mugabe	Kigali-East
Albertine Murekatete	Kigali-West
Berthe Niyonzima	Kigali-West
Jocelyn Kayitesi	Kigali-West
Noeline Uwanyiligira	Kigali-West
Alphonse Kagabo	Bugesera
Languida Mukamana	Bugesera

Annex D. Some Pictures from the FGDs
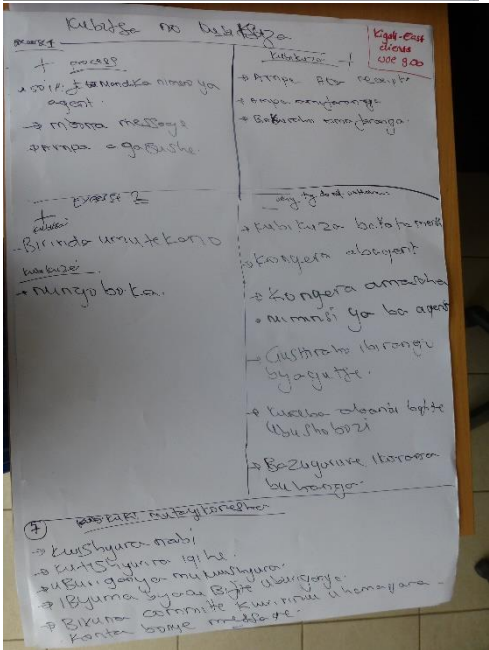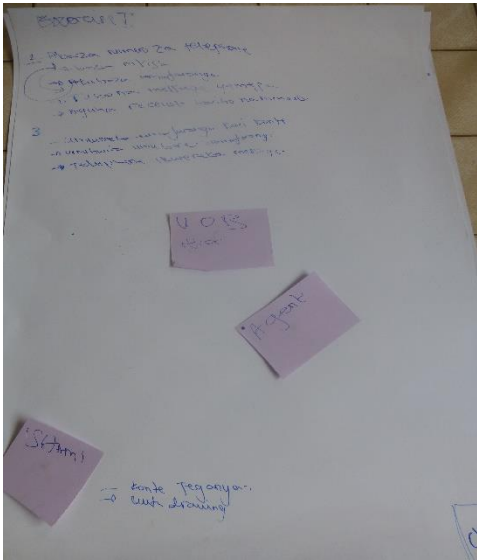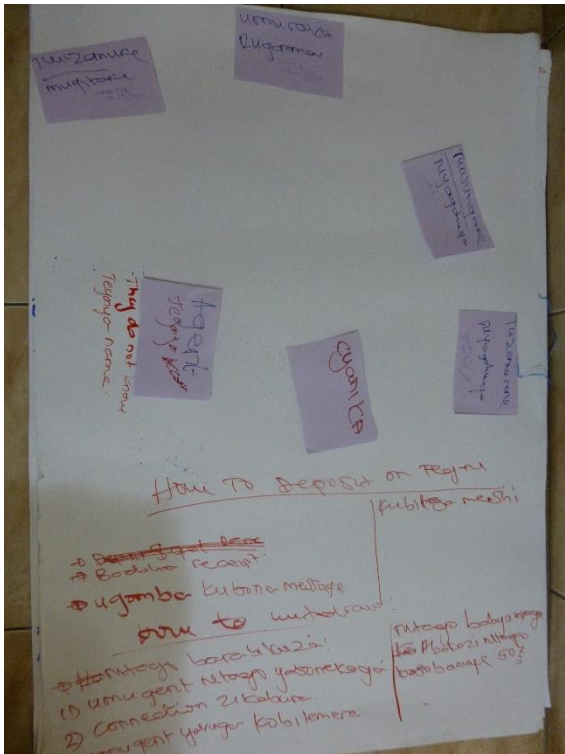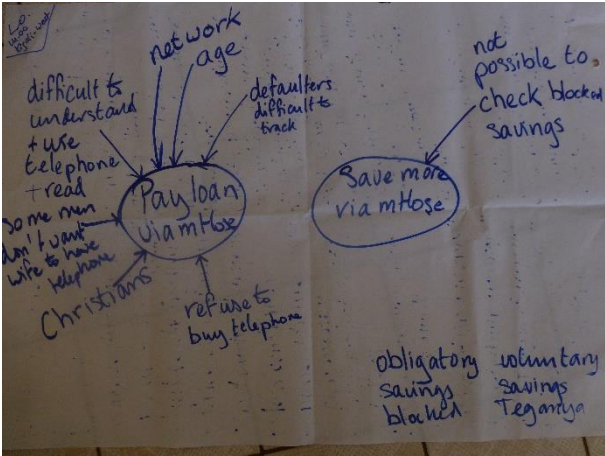
Annex E1. Telephone Survey Questionnaire mHose Users

TELEPHONE SURVEY QUESTIONNAIRE FOR GROUP CLIENTS REGISTERED WITH MHOSE   – ACTIVE MHOSE USERS –

Data of client (from system)

Client number:

Client name:

Group number:

Group name:

Telephone number:

Date registered for mHose:

February activity (# transactions with mHose):

March activity (# transactions with mHose)

EBU:

Age:

Gender:

Introduction

Hello, am I speaking to [client's name]?

You are speaking with [your name] from Urwego Opportunity Bank. How are you doing? The reason that I'm calling you is because we are interested in your experience with our mHose service. Do you have the time to answer a few questions? It would take about 10 minutes of your time.

Before I continue with the questions, I would like to inform you that the answers that you give us will be reported anonymously and will give us a total idea about the experiences of mHose users. So please, to help us make our mHose service better, could you answer the questions as honestly as possible.

Question 1:

Since you signed up for mHose, have you been using mHose yourself?

- o Yes

- o No

- o Didn't work

- o Don't know

- o No answer

Question 2:

    a. When was the last time that you used mHose?

- o March

- o February

- o January

- o Last year

- o Not used

- o Don't know

- o No answer

    b. Have you used mHose to deposit cash on your Teganya account?

- o Yes

- o No

- o Didn't work

- o Don't know

- o No answer

    c. Have you used mHose to pay loan plus obligatory savings?

- o Yes

- o No

- o Didn't work

- o Don't know

- o No answer

d. Have you used mHose to send money?

o Yes

o No

o Didn't work

o Don't know

o No answer

e. Have you used mHose to pay bills?

o Yes

o No

o Didn't work

o Don't know

o No answer

f. Have you used mHose to top-up airtime?

o Yes

o No

o Didn't work

o Don't know

o No answer

Question 3:

a. Where have you deposited cash since using mHose?

o Agent

o Relationship Officer

o Group Leader

o Group Treasurer

o UOB Branch

o Multiple

o Other

o Don't know

    ○   No answer

   b. Where are you at the moment that you pay loan with mHose?

      ○   Home

      ○   Agent

      ○   Relationship Officer

      ○   Group Leader

      ○   Group Treasurer

      ○   UOB Branch

      ○   Multiple

      ○   Other

      ○   Don't know

      ○   No answer

Question 4:

   a. How many times in the past 4 weeks have you successfully used mHose to pay loan?

      ○   0 times

      ○   1 time

      ○   2 times

      ○   3 times

      ○   4 times

      ○   5 times

      ○   6 times

      ○   Other

      ○   Don't know

      ○   No answer

   b. How many times in the past 4 weeks have you deposited cash with mHose when you didn't have to pay loan?

      ○   0 times

      ○   1 time

- o 2 times

- o 3 times

- o 4 times

- o 5 times

- o 6 times

- o Other

- o Don't know

- o No answer

Question 5:

a. Is the nearest agent closer than the group meetings?

- o Closer

- o Further

- o Same

- o Don't know

- o No answer

b. When you deposit cash at the agent, does it take you more, less or same time as before mHose?

- o More

- o Less

- o Same

- o Don't know

- o No answer

Question 6:

a. How often have you attended a group meeting in the past four weeks?

- o 0 times

- o 1 time

- o 2 times

- o 3 times

- o 4 times

- o Other

o Don't know

o No answer

b. Before using mHose, how often did you meet your group every 4 weeks?

o 0 times

o 1 time

o 2 times

o 3 times

o 4 times

o Other

o Don't know

o No answer

Question 7:

a. What problems have you had with using mHose on your phone?

o Network/connection down or slow

o Don't have an own phone

o No sms received

o Transaction error

o Forget mPin

o Don't know how to use service

o No problem

o Other

o Don't know

o No answer

b. What problems have you had at the agent?

o Network/connection down or slow

o No sms received

o Transaction error

o Out of cash

o Queues

o Absence

- o Too far away

- o Agent stopped operating

- o Agent doesn't know how to use service

- o No problem

- o Other

- o Don't know

- o No answer

Question 8:

Do you feel your money is more or less safe when you use mHose?

- o More

- o Less

- o Same

- o Don't know

- o No answer

Question 9:

a. How often have you contacted the UOB (5151) call centre since you started using mHose?

- o 0 times

- o 1 time

- o 2 times

- o 3 times

- o 4 times

- o 5 times

- o 6 times

- o Other

- o Don't know

- o No answer

b. *If yes:* have they solved all the problems you asked help on?

- o Yes

- o No

- o Other

o Don't know

o No answer

o Not applicable

Question 10:

    c.   Has mHose service made your life more difficult or easier?

o More difficult

o Easier

o Both

o Same

o Don't know

o No answer

    d.   Would you advise your family and friends to mHose?

o Yes

o No

o Don't know

o No answer

Annex E2. Telephone Survey Questionnaire mHose non-Users

TELEPHONE SURVEY QUESTIONNAIRE FOR GROUP CLIENTS REGISTERED WITH MHOSE
– NON-ACTIVE MHOSE USERS –

Data of client (from system)

Client number:

Client name:

Group number:

Group name:

Telephone number:

Date registered for mHose:

EBU:

Age:

Gender:

Introduction

Hello, am I speaking to [client's name]?

You are speaking with [your name] from Urwego Opportunity Bank. How are you doing? The reason that I'm calling you is because we are interested in your experience with our mHose service. Do you have the time to answer a few questions? It would take about 5 minutes of your time.

Before I continue with the questions, I would like to inform you that the answers that you give us will be used anonymously and to give us a total idea about the experiences of our mHose clients. So please, to help us make our mHose service better, could you answer the questions as honestly as possible.

Question 1:

Since you signed up for mHose, have you been using mHose yourself?

- o   Yes

- o   No

- o   Don't know

o No answer

Question 2:

When was the last time that you used mHose?

- o January
- o Last year
- o Not used
- o Don't know
- o No answer

Question 3:

a. Where did you deposit cash on your Teganya account in the past 4 weeks?

- o Relationship Officer
- o Group Leader
- o Group Treasurer
- o UOB Branch
- o Multiple
- o Other
- o Nowhere (haven't used)
- o Don't know
- o No answer

b. Where are you at the moment that you pay loan with mHose?

- o Relationship Officer
- o Group Leader
- o Group Treasurer
- o UOB Branch
- o Multiple
- o Other
- o Nowhere (haven't used)
- o Don't know
- o No answer

Question 4:

How often have you attended a group meeting in the past 4 weeks?

- o 0 times
- o 1 time
- o 2 times
- o 3 times
- o 4 times
- o Other
- o Not relevant
- o Don't know
- o No answer

Question 5:

Why don't you use mHose (anymore)?

- o Don't have a phone or sim
- o Don't understand mHose
- o Connection problems
- o Reminding sms comes late
- o Incorrect pay loan message
- o High withdraw fees are charged
- o Don't want number of group meetings to change
- o Repayment of group members gotten worse
- o More difficult to see when somebody defaults
- o More work to contact defaulters
- o Agent is too far away
- o Agent doesn't have enough float
- o Agents are not available any time
- o Agent doesn't know how mHose works
- o Call-centre service can't help me
- o Other: ……………………………..
- o Don't know
- o No answer

Annex E3. Telephone Survey Urban Respondents

Urban Users

Aloys Kananga

Aloys Ruberwa

Anastasie Ingabire

Antoinette Mukaruyonza

Appolinaire Abanyirigira

Azelle Mujawitegeka

Beatha Mukamana

Beathe Mukankundiye

Bertine Muragiwenimana

Celine Nyiranteziyaremye

Chantal Niyonteze

Christine Uwizeyimana

Christine. Mukanteziryayo

Clarisse Mukarukundo.

Clarisse Ndacyayisenga

Claudine Murekatete

Claudine Uwingeneye

Denise Umuhire

Derphin Karayi

Donatha. Mukamuganga

Ednas Ugirumuha

Emmanuel Mushimiyimana

Emmanuel Tulikumwe

Esperance Mukamurenzi

Evariste Ndayishimiye

Francine Uwineza

Francoise Mukanyandwi

Gloriose Dusabemariya

Helen Abandibana

Ildephonse Bucyabutata

Immaculee Dushimimana

Immaculee. Mbabazi

Jacqueline Mukarango

Jacqueline Niwemugeni

Jacqueline Uwamahoro

Janvier Mudahunga

Jean Baptiste

Jean Bosco Emmanuel Dufatanye

Jean De Dieu Nsaguye

Jeannette Ihimbazwe

Jeannette Tuyisingize.

Joseph Tuyisenge

Josiane Umuhoza

Judith Muhongayire

Marie Chantal Mporendore

Muhamed Muhamed

Mukangango Dorothee

Osward Ntakirutimana

Pascal Maniraguha.

Pontien Kananga

Pourcherie .Mukaremera

Protais Rwagizenkana

Rehama Nyiransabimana

Samuel Mukeshimana

Samuel Ndatimana

Thadee Sikubwabo

Theoneste Hagumakubaho

Therese Rucyahana

Yvette Ndahimana

Yvonne Akumuntu

Urban Non-Users

Adrien Havugimana

Alexia Mukagatete

Ali Mugabo

Alice Uwera

Alodia Murerwa

Beatrice Umukunzi

Brahimu Niyibizi

Carine Kayiganwa

Chantal Manibirimo

Charles Mugenzi

Charlote Uwineza

Christine Imananimwe

Claudine Niyigena

Clementine Nzamukosha

Delphine Mukabatsinda

Dorothee Mukashema

Elyse Nzayisenga

Emmanuel Kayijamahe

Florence Umurerwa

Francine Mukayizera

Francois Rusagara

Francoise Mukagakuru

Francoise Musabyimana

Francoise Uwamaliya

Frida Dushimimana

Gilbert Mugabonabandi

Guido Maniriho

Jacqueline Kandama

Jacqueline Kayitesi

Janviere Mukanzigira

Jean Claude Murenzi

Jean Marie Vianney Bigirimana

Jeanne Uwineza

Joel Maniragaba

Joseph Dushimimana

Josiane Uwera

Josiane Uwera

Laetitia Mugeni

Liberathe Muragijimana

Marie Louis Muhongerwa

Marie Niyonteze

Modeste Tuyishime

Nathalie Munganyinka

Pelagie Mukabaranga

Peruth Mukanyarwaya

Pierrine. Umutoni

Primitiva Dusabemariya

Saidati Mukagasana

Souzane Musengimana

Sylvestre Ndagijimana

Tharcisse Ndagijimana

Theo Siladji Mungaliho

Theogene Dusingizimana

Veneranda Mukamuganga

Venuste Habimana

Venuste Nshimiyimana

Vianney Munyaneza

Viateur Nzabantumye

Victoria Mukarugira

Yvone Mukandekezi

Annex E4. Telephone Survey Rural Respondents

Rural Users

Adeline Mukawera

Albertine Nyirahagenimana

Alphonse Ryamukuru

Alphonsine Murebwayire

Anastasie Uwamahoro

Asiya Kayitesi

Beathe N.ntezimana

Beatrice Uwineza

Beatrice Umulisa.

Beatrice Manariyo

Beatrice Nzamwitakuze

Cecile Mukanyandwi

Christine Mukamakuba

Claudine Mukahigiro

Claudine Nyirambarushimana

Clotolde Uwiragiye

Damarce Batamuliza

Dancille Nyirandoreye

Dative Uwimbabazi

Diane Uwamahoro..

Diogene Habanabakize

Diogene Mutoni

Donata Mukabakina

Edith Musabyemariya

Emelyne Mukantabana.

Emmanuel Musabyeyezu

Epiphanie Mukansanga.

Epiphanie Uwamahoro

Ernestine Nyirabimana

Esperance Nyiramugwera

Eugenie Mukamusonera

Evode Ndagijimana

Genereuse Uwamahoro

Germaine Mukakarangwa

Grace Uwantege

Grace Mumporeze

Innocent Hitimana

Janviere Ingabire

Jean Claude Iyamuremye

Jeannette Uwamwiza

Josue Irarora

Junith Uwimbabazi

Kassim Maniriho

Madjidi Uwineza

Marie Grace Dusabe

Marie Rose Uwimana

Mediatrice Mukankusi

Marie Claire Mukangarambe

Olive Nyiramahoro

Patricie Nyirankumbuye

Pauline Uwiragiye

Rose Mukarutamu

Rusi Uzayisenga

Seraphine Mukagasana

Theogene Twahirwa

Valerie Mukansanga

Venantie Mukabaranga

Vianney Habineza

Xxx Hakizimana

Yusufu Nzabonimpa

Rural Non-Users

Abdara Bamporiki	Marie Louise Nyirikidende
Agnes Nyirasoko	Marie Solange Nyiraneza
Alexis Nshimiyimana	Marthe Nyirahabimana
Alexis Nzeyimana	Martin Uzayisenga
Ally Hategekimana	Naphtal Habiyaremye
Alphonsine Mukagatsinzi	Nyirangendahimana Patrice
Assoumpta Ntagisanimana	Pauline Mukeshimana
Beatrice Uwumuryango	Peruth Muhawenimana
Chantal Muhimpundu	Rehema Nyiransengiyumva
Clarisse Usanase	Ruth Murerwa
Claudine Kambabazi	Samuel Baranyeretse
Claudine Muteteli	Seraphine Nyirahacineza
Dominiko Rurangirwa	Sophonie Musabyimana
Eminah Niragire	Suzan Mukabayingana
Emmanuel Ndayisenga	Sylvere Harelimana
Eric Nzabandora	Sylvestre Nsanzimana
Esperance Kagwaneza	Theonille Hakuzwemariya
Esperance Ukwitegetse	Uwambayinema Uwambayinema
Etienne Munyemanzi	Vestine Mukaruhunga
Eugenie Mukeshimana	Vestine Uwingeneye
Ferdinand Ndikubwayo	Virginie Uwizeyimana
Francoise Niyitanga	Virginie Mukashyaka
Gorette Mukeshimana	Wellars Kiramira
Hasha Nyirakimonyo	
Honorine Mujawamariya	
Ignace Mungwarakarama	
Jean Claude Rusimbi	
Jean Eric Byabagabo	
Jeanette Nyirangwabije	
Jeannette Nyirangwabije	
Jules Kagaju	
Justine Mukeshimana	
Liberathe Mukakamali	
Lucie Iradukunda	
Madeleine Mukabaranga	
Marc Ntigulirwa	
Marie Josee Iribagiza	