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What is the impact of ICT infrastructure and mobile phones in Rwanda on its aspirations to transform into a knowledge-based, middle-income economy? And what about the farmers?

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(Supervisor – Dr Shailaja Fennell)

Abstract

Rwanda was a poor, aid dependent subsistence farming economy when it set itself the goal, set out in Vision 2020, of becoming a middle income country by 2020. Agriculture and ICT were both important pillars in the strategy to achieve the goal. This presentation considers the impact of ICT development in Rwanda, in particular the near-universal reach of mobile phone connectivity, on farmers still gaining their livelihood through subsistence farming, often in remote rural areas. Drawing on interviews of policy makers and implementers, awareness of the impact at the centre of strategic planning is considered. There is surprise at the speed of mobile phone usage – and at the rise of money transfers by phone. The regulatory response and promotion of further technological development in the financial sector, so as to improve services in rural areas is also identified. Household survey data show the importance and different status of phones within the household, compared with other assets. They are more often sold under financial pressure, but they are more often subsequently replaced than other assets. Financial initiatives delivered via mobile phone connectivity in poor countries, especially those with difficult agricultural contexts, clearly have high impact potential, and require further study.

Rwanda is a small, landlocked, mountainous country more or less on the equator. It has achieved relative political stability this century after enormous challenges culminating in the Genocide against the Tutsis in 1994. The population is about 11 million, of whom about 10% live in the capital city of Kigali. Most of the population – 88% of the rural population - depend wholly or to a considerable degree on farming for their livelihood. Of those, the vast majority still farm mixed crops on small family holdings, with most of the production being consumed by the family. In other words, most of Rwanda is still economically dependent on subsistence farming. Few have access to irrigation, and depend on rainfall for their cropping.

Food security has improved in the last eight to ten years. Whilst nutrition is still poor in many families, hunger, starvation and absolute food shortages are rarer, with 80% relative food security in the population (World Food Programme 2016).

Rwanda has achieved some important development successes. Annual GDP per capita has grown consistently for over a decade, and actual GDP growth has exceeded 7% per annum for 15 years. Life expectancy has increased, starting from a

low base. Rwanda now does better on this and a number of other health measures than any of its immediate neighbours, including Uganda. (See for example, World Development Indicators, <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>)

In 2000, after over two years of national dialogue, the government of Rwanda published a policy document entitled 'Vision 2020'. **"...the major aspiration of Vision 2020 is to transform Rwanda's economy into a middle income country (per capita income of about 900 USD per year, from 220 USD in 2000)..."** (Government of Rwanda 2000, page 4). The 2014 per capita income in Rwanda was about 720 USD, compared with 210 USD in 2001, by the same measure (National Institute of Statistics Rwanda (NISR) 2015).

Vision 2020 says economic transformation has to be approached via an 'achievable program' based on six pillars. Two pillars are: Transformation of agriculture into a productive, high value, market oriented sector, with forward linkages to other sectors; and Infrastructural development, entailing improved transport links, energy and water supplies and ICT networks. (ibid) Implicit in these two pillars are a shift from subsistence farming to more economically dynamic and intensive production and the introduction of access to ICT across the population.

As noted, the majority of farmers are engaged in subsistence practices. Within programmes such as the Rural Sector Support Project and Land Husbandry, Water Harvesting and Hillside Irrigation (RSSP and LWH) commercial frameworks are emerging, whilst allowing smallholder farmers to remain in control of their own plots of land. Most of those involved in RSSP/LWH programmes support their families with agricultural work, largely through the sale of agricultural produce. In 2012 RSSP was reaching over 12,000 hectares of marshland and hillsides (Strode et al. 2012). The reach of the projects has increased since then. But most Rwandans are outside such programmes, and spillover effects are limited (Strode et al. 2012 page 53).

Telephone connectivity is now more or less universal in Rwanda. Mobile phone connectivity is available to 98% of the population. Broadband access is widely available, but used much less. In 2013, broadband speeds in Rwanda were the fastest in Africa (Freedom House 2013).

On a day to day basis the impacts of widely available telephone connectivity are easily felt. In January 2010 it was complicated to reach a group of farmers at an agreed place and time, requiring several intermediaries often with face to face discussions. By the end of 2014 meetings could be easily arranged with a series of phone calls via District, Sector and Cell leaders, so that village leaders would be waiting as a car pulled up in a remote village. It is evident that coordination, extension services and day to day arrangements have become easier and more accessible as a result of the mobile phone penetration of rural Rwanda.

My research is about access to finance – ‘financial inclusion’. The Government of Rwanda has a policy to achieve 80% formal financial inclusion (meaning adults using at least one formal financial service) by 2017. I examine how that policy has been articulated, promoted, transmitted and received at community level. It is striking how often technology is mentioned in the context of financial inclusion. Its importance is now a given – and IT infrastructure is a major preoccupation in terms of the reach and quality of financial services, the flexibility and proximity that become possible, and the policy and regulatory attention paid to the financial inclusion/technology nexus. In the Finscope survey report of 2016, phone money transactions were included in detail for the first time: captured as formal financial non-banking services. (Murenzi 2016)

This presentation highlights that preoccupation, drawing on individual interviews carried out in December 2014. It will also show the impact on four rural communities of widespread access to phones – particularly in terms of financial services, and economic inclusion. That element draws on data from a household survey carried out in four villages in Rwanda’s Eastern Province in September 2015.

For the individual interviews, senior people with responsibility for articulating and implementing policy were approached. These included the Minister of Agriculture, the Deputy Governor of Rwanda’s Central Bank and various senior civil servants and private sector representatives with direct engagement in financial inclusion, especially in rural areas. The interviews took a semi-structured approach, finding out what defined financial inclusion in the interviewee’s mind, and then seeking to establish their role and concerns in promoting financial inclusion.

For the household surveys, a pre-written questionnaire was administered sequentially in two parts. The first part asked largely qualitative questions about what people valued – and aspired to – in their lives. The second part, is drawn on for this presentation, explored daily activities within the household, asset ownership and direct access to financial services. The second part also asked about reluctant sales of assets (eg because someone needed money urgently) in the last five years.

The household surveys were carried out in four villages, each randomly selected within one of four pre-determined regions in the Eastern Province of Rwanda. None of the villages was known to any of the data gathering team. Each village contained between 208 and 230 households, and the selection process was adjusted so that there were 35 households sampled randomly from each village. In all cases but two, the selected household members were interviewed. For the two instances where interviews were not possible because of the long-term absence of the household, substitutions to their nearest neighbour were made. Interviews were carried out with whoever was in the house (provided they had knowledge of the overall finances

of the household). For the qualitative sections of the survey, the gender and age of the respondent will be a material issue, but for the quantitative information we do not expect an impact, since the questions related to household circumstances.

The surveys were conducted by a team of five data gatherers, working in the local language. The surveys have subsequently been translated into English (though the quantitative data can be read off the original forms). I was present throughout the data gathering process – with primary responsibility for looking after the vehicle in which the whole team moved... I monitored the random sampling process, dealt with queries and checked survey forms for completeness. Where gaps were noted, team members would return to the household and follow up.

This dual approach to investigating financial inclusion creates two different perspectives. From the ‘top-down’ point of view, there is great awareness – and some surprise – about the rapid changes being brought about by technology in the area of financial inclusion. This is largely due to the widespread access to phones, and to the presence of phone money: each of the major phone networks has its own money transfer system, and recently interoperability between the various networks became possible.

An example of the ‘surprise’ element is seen in the words of the Minister for Agriculture (who had recently stepped down at the time of the interview). This is set out in Box 1. Her particular surprise is that the new technology is being adopted by rural and less educated individuals, rather than primarily by the urban well-to-do.

Box 1:

“...money is just moving around through the telephone. Money is moving from city to village and from village to city.

It’s the fastest, easiest and probably most popular way to send money around in Rwanda. I think it’s everywhere. I always get surprised at how much someone who has hardly gone to school – a maid for example – is telling you ‘I need to send money to my parents...’ Like several villages away, or hundreds of miles away. OK. Or ‘send me money... I need you to send me money. OK, let me send you my mobile money number.’ They’re like ‘You don’t know how to do this?’

Dr Agnes Kalibata, former Minister for Agriculture in Rwanda (2009 – 2014)

The Vice Governor of the Central Bank in Rwanda (BNR) highlighted the leadership role that Rwanda is taking in the region in promoting the use of mobile financial services. See Box 2 for her comments. She is aware of the flaws and regulatory risks (to which she must respond as part of her specific role in the financial inclusion strategy adopted by BNR). However, as she says, "...the balance is [seen as] positive."

The private banking sector is coming to terms with the impact of the telephone sector's encroachment into financial services. See Box 3 for the thoughts and comments of the Chief Operating Officer of Bank of Kigali, a commercial bank with a relatively strong presence in Districts outside of Kigali, as well as in the capital city.

Box 2:

"We've been leading in our EAC– East African Community - region. We've been part of this as financial inclusion advocates – especially for mobile financial services.... So it's really part of our mainstream activities."

"There is always a general risk with financial inclusion – to drive it, you need innovations, and with innovations you can accept an innovation into the system, which might later backfire, or be abused. For instance, when you talk of mobile financial services, you don't necessarily have all the controls in place to prevent fraud - and when it happens it happens. We know about the flaws which have happened – but we don't mention those other good things that have happened as well. All in all, as policymakers and regulators, we agree that the balance is positive, but you have to be aware of the possible negatives. You have to be better prepared to prevent problems – and you coordinate, with other regulators and the market, to act fast if there is something wrong. That is happening."

Monique Nsanzabaganwa – Deputy Governor of The National Bank of Rwanda – BNR (Rwanda Central Bank)

Box 3:

"In other countries, banks look at Telco's with suspicion – but here we do not see them as competitors. We have different products. We say you have virtual money and we have real money. We are connecting telcon financial services to our bank accounts. Our project is due to be commissioned this month.

"Integration between telco and our mobile banking for agency banking is coming. ... This process of integration will bring additional points for transactions. Telco banking points struggle with liquidity – having cash where it's needed for the transactions demanded. ... We want to open with mobile phone pay in and out of bank. You can live whole life without going to the bank. Maybe you need to go to an agent occasionally to load or download cash."

Lawson Naibo, COO, Bank of Kigali

Within the Ministry of Finance (Minecofin) the unit responsible for promoting financial inclusion is becoming engaged with technology as a means of providing banking services that are both local and capable of engaging with the wider financial

system. The network of Umerenge SACCO's (Sector-located savings and credit cooperatives) has increased access to financial services in Rwanda since 2011, but the service offered is totally local, and somewhat variable from sector to sector. The Director General in charge of this area sees technology as the driver for both increased and more uniform services. See Box 4 for his comments.

Box 4:

"A component which is dear to us is automation and computerisation. How many of our SACCO's are manual? Most are on excel – all are stand alone.

We are buying a core banking system – so the SACCO's [can] talk to each other. ... We are thinking about consolidating ... at national level to do ... non-core support services; internal control mechanisms; liquidity management and refinancing; and local and international financial transfer systems."

"Another component. Even if it's up and running, a SACCO can be 5 km away – even at Sector level. For small day to day business that can still be a big deal. We will encourage mobile payment and agent banking with the aim to reduce the distance to 2km.

If we get that, then we have financial inclusion."

Eric Rwigamba, Minecofin, DG Financial Sector Development Directorate

Finally, there are more junior people who take on the task of promoting financial inclusion – in this case to farmers. Working for RSSP/LWH, the rural finance specialist highlights the interaction between providing good service, embracing new partners and the reality that the big players are already there, providing services irrespective of the preferences of other institutions. See Box 5 for his comments.

Box 5:

"One of the other things: for the financial inclusion, it requires also the technology basis: the management of data and quick service. So many of the financial institution partners to the project (RSSP/LWH) are using also mobile money.

Although ... many of them are not ... let's say on the management information system - it is not yet installed in their institutions; but many of them are members of this huge network - this big boss, the MTN or Tigo or Airtel. So they are partners, and then they can work together for the mobile money transactions."

Jean Claude Karemera, Rural Finance Specialist, RSSP/LWH

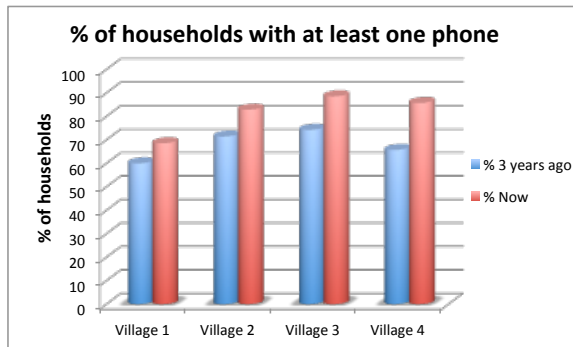
Overall, it is easy to detect some concern about what the regulatory environment should look like: is it playing catch up as the telephone networks move fast and win business from vulnerable consumers?

There is a recognised need for the knowledge base surrounding financial services, including the phone money sector, to move fast – skills and knowhow are a potential blocker. For example, some Umerenge SACCO's have computerised records, but some are an exercise book on a trestle table. All are reporting monthly – and the aim is to combine/merge/create a national cooperative bank out of the individual SACCO's. This is only possible if minimum standards of accounting, bookkeeping and skills are spread even to the poorest parts of the country.

The concern runs from the top to the bottom – and a lot of it turns around technology as a means of providing more flexible, more suitable, more accessible services.

Turning to the household survey, this sampled 140 households across four villages spread evenly across the Eastern Province. Given the village and sample sizes, we can have 95% confidence in the accuracy of the results as a description of each village, plus or minus 15%.

Figure 1: % of Households with at least one phone

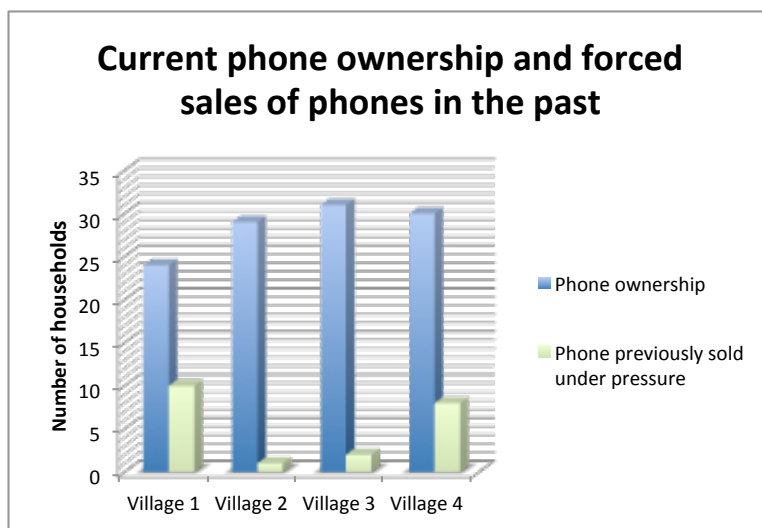


Telephone reception was good in all the villages. In over 80% of households surveyed, there was at least one phone. This fell to just 68% in one of the villages. (See Figure 1). This village was the most poorly served in other ways such as distance to schools, clinics and the nearest

financial services was more than an hour’s walk, demonstrating the tendency for elements of social exclusion to agglomerate in some areas.

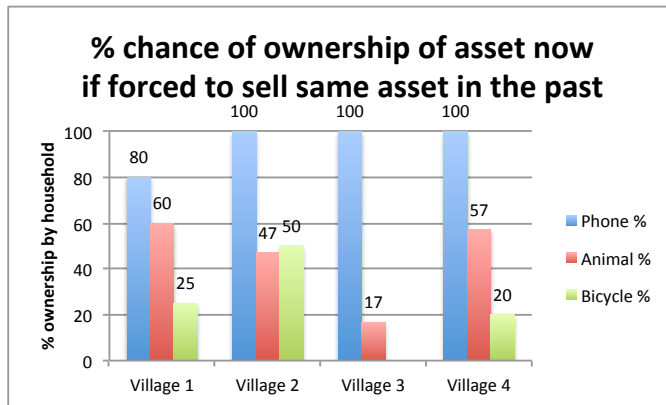
The survey asked about assets – and about sales of assets under pressure. 18% of phone owning households had sold a phone reluctantly in the last five years, mostly in 2014 or 2015. The sales were unevenly distributed, with few forced sales in Villages 2 and 3, whilst 27% of owners in Village 4 and 42 % in Village 1 had sold at some point. (See figure 2.)

Figure 2: Current phone ownership and sales of phones in the past



The survey asked about other assets as well, including mattresses, bicycles and animals. Phones were the asset most often sold – but also by far the most frequently replaced. Out of a total of 21 households where phones had ever been sold, only two (in Village 1) did not currently own a phone.

Figure 3: % chance of ownership of asset if forced to sell the same asset in the past

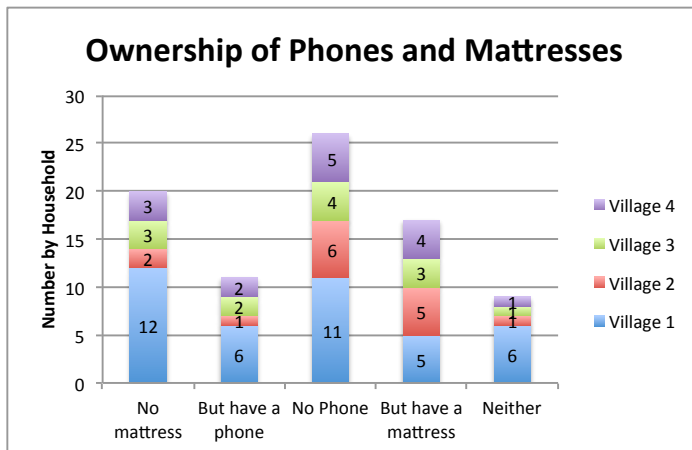


Bicycles are the least likely asset to be replaced after a reluctant sale, with less than half of the former bicycle owners currently owning one. Animals are also much less likely than phones to be replaced. (See figure 3.)

Farmers have told me in the past of their aspiration to have a mattress to sleep on. I had expected a mattress might be the first asset a household would own. However that is not consistently true. Some households own phones before they own mattresses.

Over the whole sample there were 20 households without mattresses, of whom over half (11) owned phones. Conversely, 26 families had no phone, but of those well over half had mattresses (17). So the order of acquisition is variable. 9 households had neither phone, nor mattress. Village 1 again fared the worst, with the highest proportion of its population being non-owners of phones (34%), mattresses (31%) and of neither (about 17%). (See figure 4)

Figure 4: Ownership of phones and mattresses



Financial services vary in formality, and in their purpose. Households combine services but phone money was by far the most commonly used, followed by informal services (savings and loans groups), with formal accounts at banks and cooperatives being the least used.

Of those who own a phone, 85% used phone money in one way or another. The 2016 Finscope report mentions widespread ignorance about phone money, but this

did not emerge in this survey. Perhaps the difference reflects that Finscope talks about individual use, rather than household (where a wider age range will be captured). This is an issue to look at in the future. 72% of phone owning households also use some other financial service. Of those without a phone, only 8% ever use phone money. Most of those without a phone (over 80%) do not use informal financial services either, and even fewer use formal services. By contrast, only two phone owning households failed to use some sort of financial service.

The household survey discloses several points of note. Firstly, there is a sense of urgency about owning phones – sometimes ahead of the very basic comforts of a mattress to sleep on. This suggests a high level of perceived disadvantage to being without a phone in the household.

Secondly, ownership of a phone within the household is a good indicator of use of financial services of some kind. Even in a phone-owning household where phone money is not used, there will probably be someone with a formal account at a bank or cooperative or participating in a savings and loans group. There may be no causal link between these two aspects of household life, but they are each potential markers for an economically engaged – included - household. A household without a phone is likely to be excluded in other ways too, certainly in the areas of commerce and finance.

Finally, there is a difference in the way phones are bought and sold, compared with other assets. Almost 20% of phone owners have sold under pressure in the past – but almost all those who sold have replaced them – which does not happen readily with other assets. This dynamic ownership highlights the importance of owning a phone, but also shows that phones provide a ready source of cash in an emergency.

Phones are changing the face of financial services in the communities surveyed. More households use phone money than any other financial service. Owning a phone means your family is more likely than non-phone owners to use other financial services. The fact of owning a phone, as an asset, offers new options when funds are needed.

There is awareness of the changes that are happening amongst those who are steering the policies and regulatory framework. There is an element of policy and regulatory ‘catch-up’, as the big phone networks press forward. It is a dynamic interaction, and merits monitoring. The Rwandan government target of 80% formal financial inclusion by 2017 has been met (it is currently at 85%). Phone money has clearly played a fortuitous part in that achievement.

This was a small study, and in general its results are reliable only for these four

specific villages. However, it sheds some light on the significance of phone ownership in poor rural communities, and the elements of social inclusion or exclusion associated with phone ownership in the household. It exposes the vulnerability of phone users as consumers, and draws out elements of the regulatory response in Rwanda. It also highlights the fact that the spread of phones, and the use of phone money, has helped the Government of Rwanda to meet its 2017 objectives in relation to financial inclusion, although that was not in contemplation when the targets were set. Financial initiatives delivered via mobile phone connectivity in poor countries, especially those with difficult agricultural contexts, clearly have high impact potential (for good – and for elements of potential ill), and require further study.

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