CHAPTER 7

Mobile phones and the food price crisis in Rwanda

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The PICTURE Africa research spanned the 2008/09 period during which East Africa (and much of the world) experienced dramatic increases in food and fuel prices. The food price increase was a result of extreme global changes of weather, amongst other factors, leading to below average agricultural production, which translated into incredible price spikes in global food and fuel costs. This chapter examines how this crisis affected spending amongst households in Rwanda's most disadvantaged areas. The descriptive findings explored the shift in household food and non-food (including ICT) expenditures and poverty levels between 2007 and 2010. While poverty levels increased, the sample households also adopted mobile phones at an increasing rate. Rural and poor households were able to maintain food expenses while having new access to mobile phone technology. Urban households faced a more difficult situation as they experienced substantial drops in non-food expenditures while maintaining access to ICT. Changes of vulnerability and mobile access did not change markedly over time. This could imply that food and fuel crises are only some of many shocks within the lives of the poor. Their spending choices adjusted according to changing values, leading to the adjusted behaviour of mobile phone maintenance for personal and business use, an activity now embedded within their everyday lives.

Keywords: Africa, food crisis, information and communication technologies for development, panel research, poverty, Rwanda

Poverty, the global crisis, and mobile phones

While the global food crisis between 2007 and 2010 resulted in dramatic commodity price increases in Rwanda, it is unclear how this affected spending patterns amongst the country's poorest households. This chapter draws on household surveys conducted by the PICTURE project to observe food and non-food household expenditures and to analyse the extent of household spending change over this crisis period. The economic crisis left 50 million more people in extreme poverty around the world by 2009 (World Bank, 2010). The Food and Agriculture Organization (FAO), which follows the food

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price index each year, found high food prices in 2010, which only declined slightly in 2011 (FAO, 2011). The same pattern of sharp food price spike and drop was also seen between 2007 and 2008.

The global food crisis was a result of the decreased availability of world food commodities, increased petrol and input costs, a growth in the global population (predicted to reach 9 billion by 2050), and the changed food consumption patterns in emerging nation states like China, India, Brazil, and Russia (FAO, 2011). All of these factors have put pressure on the global food demand. The global food crisis in 2007/08 had a distressing impact on the population. The Global Hunger Index found that by 2009, the world counted over one billion hungry people (von Grebmer et al., 2011). Africa had some of the most extreme levels of persistent hunger. African households are still largely dependent on agricultural productivity for their livelihoods in terms of food subsistence and income. Wodon and Zaman (2010) argued that the higher food costs would lead to welfare losses, particularly affecting the already poor, as well as an increase in poverty in Africa. Food insecurity was found to be increasing in East and South African countries alongside global inflation of food prices (Headey, 2011). Childhood under-nutrition can lead to poor physical and mental development, which have detrimental effects in later adult life (Victora et al., 2008). The assurance of adequate food provision during the crisis had become less secure for the poor, who became unable to pay for the higher costs for food.

The inability to meet rising food costs can mean adjusting household budgets and purchasing less food. Regmi et al. (2001, cited in von Braun, 2007: 6) argues that, 'for every 1 per cent increase in the food prices, food consumption expenditure in developing countries decreases by 0.75 per cent'. As households are trying to find ways to cope financially with higher food prices, they are looking for strategies to allocate scarce resources to pay for proliferating ICT, in particular to cover mobile phone costs. Given the phenomenal increased use of mobile phones in the East African region (see Chapter 2, May et al., 2014), we need to understand the role mobile phones play within the crisis. One possible approach is to analyse the strategic use of information and communication technologies, especially when used to leverage changes in household budgets. A review (Ruel et al., 2010) of those most vulnerable during shocks like the food crisis found that the urban poor were most affected. The study also revealed vulnerability, as the re-allocation of resources such as cuts in food costs, health, childcare, and education were part of household members' coping strategies.

These food budget and expenditure choices of African households are occurring in the midst of the continent's growing and ongoing demand for information and communication technologies (ICT). The implementation of Rwanda's National ICT strategy, complemented by increased ICT infrastructure (both broadband and mobile phone operators) as well as partnership initiatives such as the One Laptop per Child (OLPC) (2007 to present), contributed to increased ICT access (Andersson and Norrmalm, 2010). Mobile

subscription jumped from 13.2 per 100 inhabitants in 2008 to 33.4 per 100 inhabitants in 2010 (ITU, 2011). The lower costs and wider penetration of certain ICTs in Africa have allowed even the poor to participate. In Chapter 2, May et al. (2014) reveal that between 2007 and 2010, 30 per cent of the respondents with less than US$2.50 per capita per day had access to ICTs. The willingness to pay for one item over the other, such as mobile phones over food, has not been well researched, although certain studies have begun to document this phenomenon (Diga, 2007; infodev, 2012). The ITU has started measuring mobile-cellular price sub-baskets as a percentage of the GNI per capita, in individual countries. For example, in Rwanda, the mobile sub-basket was 34 per cent of the per capita GNI (ITU, 2012), much higher than in Kenya, Uganda, and Tanzania, with values of 6.8 per cent, 25.1 per cent, and 22.9 per cent respectively (ITU, 2012). The relatively high costs of ICT in Rwanda are part of the balancing act of accessing and having certain essential household items within one's meagre income.

In some cases, mobile phones, despite costs, have improved local capacity to deal with the unpredictable changes in food prices, and thereby helped lower the severity of poverty. For example, farmers have used mobile phones to search and share market prices of produce as well as bargain a fair price for their produce in Niger (Aker, 2008). A further study in Niger investigated the 2005 food crisis and showed that sharing pricing information via mobile phones resulted in lower price dispersion across markets (Aker, 2010). While mobile phones will certainly not be a means of feeding the hungry, they can be useful to access other resources and mitigate the major depletion of a household expenditure budget. The period 2007/08–2010 saw substantial levels of increased global poverty, a food crisis which inflated produce and fuel prices to extreme levels, yet at the same time it saw the great uptake of ICT on the African continent. Within this context, there remains a research gap on how these dramatic changes affect everyday life in East Africa. This study explores Rwanda at the micro-level, particularly examining this mix of changes amongst households located within the country's poorest communities.

East Africa: global economic recession

The East African region was far from sheltered during the global economic recession, which saw rising food and fuel prices in the region. Higher costs for transportation, erratic weather changes, and high-priced agricultural inputs were felt by its citizens, particularly in rural agricultural zones. The PICTURE Africa study was completed during the food crisis in East Africa. This Rwanda study takes the PICTURE data and provides insight to the household expenditure changes amongst the poor as a result of these lower incomes and extreme price levels.

Rwanda is a central African country with a land area of 26,338 km^2, a population of 9 million and a population density of 377 people per square kilometre, one of the highest densities in sub-Saharan Africa. Rwanda had experienced the highest level of vulnerability, or the greatest risk of slipping

into absolute poverty and deprivation. Resettlement after the 1994 genocide involved nearly 3.5 million people, 107,000 were imprisoned, and more than 30 per cent households were headed by women and 85,000 were headed by children (Republic of Rwanda, 2002). The number of vulnerable persons may have gone down since 1994, but remains high with more than 20 per cent of households headed by women and more than 11 per cent of the population landless (Musahara, 2005). The population is dependent on subsistent agricultural production (Huggins, 2009), yet recent changes of land and agricultural reform policy can place uncertainty on land tenure and food security for such farmers (Pritchard, 2013).

During the survey period from 2007–10, Rwanda was not shielded from further shocks like the food crisis. In fact, during this period, fuel prices saw substantial increases, since Rwanda is an oil-importing country and hence dependent on global economic and socio-political circumstances (Republic of Rwanda, 2011). The inflation rate in Rwanda during the PICTURE Africa study started at around 12 per cent in 2007, dropped slightly below 5 per cent by January 2008, rose sharply to approximately 21 per cent in 2009, and dropped to under 5 per cent near the end of the study. Greater inflation rates lower the value of average earnings, making it a challenge for the poor to move out of poverty.

Interestingly, in May 2011, after the PICTURE Africa study was conducted, Kigali was noted as the one East African capital city which had maintained consistent fuel pump prices, while its neighbours in Nairobi and Kampala were experiencing a crisis of short supply. The Rwandan government had prepared itself by holding oil reserves and monitoring fuel prices in order to mitigate substantial price changes. For example, in January 2011, Rwanda had a fuel price of 887 FRw (US$ 1.47), which rose to 1,015 FRw (US$ 1.67) in May (14% increase). However, Tanzania and Kenya saw increases of 60 per cent and 21 per cent respectively in prices at petrol stations (Karuhanga, 2011). Nevertheless, rising fuel prices in Rwanda played out in the higher cost of commodities in the region. As one news report stated, ‘Claude Habiyambere, a market vendor said that sales have dwindled in recent months as customers cut spending due to the increase in prices’ (Nyesiga and Ngamije, 2011).

Besides the higher food and fuel prices in the country, some parts of Rwanda underwent severe natural disasters between the periods of 2007–10, and the communities are certainly prone to further periodical changes of weather. The western part of Rwanda experienced heavy flooding, leading to a displacement of just over 1000 households or around 5,000 persons, by 12 September 2007. There were also major earthquakes in February 2008 in the southwest of the province (Reliefweb, 2008), and heavy wind and rains affected residents in the Western Province at the end of September 2008. The global economic recession affected Rwanda on top of other ongoing incidences of vulnerability.

Rwanda poverty profile

Rwanda is one of the world's poorest countries with a per capita GDP of approximately US$230. The poverty definition in Rwanda reflects multidimensional elements and is reflected in a complex inter-linkage of past problems that cannot be resolved easily. The poor do not have enough land, income, or resources and have little or no access to basic needs (Republic of Rwanda, 2002). Currently it is estimated that 56.9 per cent live below a national poverty line of 90,000 FRw (Rwandan Francs) (or US$164) per adult per year.

The most recent Household Living Conditions Survey (EICV2 (2005/06)) shows that the gap between the poor and non-poor may be widening. While the Gini coefficient was 0.29 in 1985, it is estimated to be more than 0.5 today. The present distribution shows that the lower 60 per cent of the population account for 20 per cent of the consumption expenditure and the upper 10 per cent mobilize 50 per cent of the consumption expenditure.

The backbone of the economy is agriculture, which employs more than 79.5 per cent of the labour force and contributes up to 34.6 per cent of GDP and 45 per cent of export revenues (as of 2006) (World Bank, 2011). As mentioned earlier, Rwanda has also invested heavily in non-agricultural areas such as telecoms and information and communication technology policies.

In 2008, Rwanda's Ministry of Local Government (MINALOC) implemented the Vision 2020 Umurenge Programme or VUP (Republic of Rwanda, 2008). Within four of the poorest sectors of all 30 districts (120 out of 416 sectors), the VUP provides some direct transfers (to the poorest), 'public works' for able-bodied household members, and access to finance and other technical assistance. Rwanda's agricultural interests, progressive ICT policy, and reduction of poverty since 1995 make the country an interesting study to investigate the household changes which took place during the financial and food crisis in 2007/08, particularly with regards to access to the mobile phone.

The concept of vulnerability

In understanding the theoretical concepts around shocks and crisis, Amartya Sen (1999) elaborates on the capabilities framework where security is highlighted as one of the five capabilities required in order to reach individual freedom. He states, 'freedom from crime and violence, and a social safety net to prevent misery, starvation, death' (quoted in Heeks and Molla, 2008: 32). The PICTURE Africa survey examined vulnerabilities and shocks as one of the dimensions for poverty within an adapted sustainable livelihoods (SL) approach. The adapted SL approach includes coping strategies or livelihood shocks which are relevant to a study undertaken during the food crisis. These elements contribute to the understanding of vulnerability. Vulnerability is 'a dynamic concept generally involving a sequence of events after a … shock' (Glewwe and Hall, 1998). Chambers (1983) discusses how

the less poor have more choices and assets to protect themselves from negative livelihood shocks, while the poor have less protection. Nevertheless, the poor use various livelihood strategies to temper difficult periods (Devereux 1993; Frankenberger et al., 2000).

Rwanda has been beleaguered with ongoing crises since 1994, and the recent global food price crisis had great implications on vulnerability upon households. This study examines vulnerability within the SL approach, but with a particular focus on changes in household spending behaviour and ICT access during 2007–10. The study is useful in seeing that even the poor demanded mobile phones during the food crisis and within constrained household budgets which are coping with high food and fuel costs.

Demographic characteristics of Rwanda's sample

The PICTURE Africa research used panel data collected during an 18-month period (2007–10). Two phases of quantitative and qualitative data collection occurred in the poorest rural and urban enumerating areas of Rwanda. The sample for Wave 1 (2007) of the survey involved 408 randomly selected households, while Wave 2 (2010) covered 302 households, 74 per cent of the 2007 sample (Table 7.1). The same households were interviewed in the second wave as in the first. The study uses both descriptive cross-sectional analysis and matched household samples from the two waves of data.

Table 7.1 Number of households interviewed

	2007	*2010*
Frequency (%)	100.0	74.5
Total households (n)	408	302

Source: PICTURE Africa 2007–10 dataset

Most of the households in both waves (58.8% and 56.6%) were located in urban areas. The 408 households covered during 2007 had a total of 1,940 household members, while the 304 households covered during 2010 had a total of 1,615 household members. The average household size for both 2007 and 2010 surveys was five, which matches with the EICV2 (2005/06) survey's average household size in Rwanda.

The mean age of individuals interviewed in 2010 was 35 years and the median was 32 years (with a standard deviation of 14 years). The mean age of households interviewed in 2007 was 22.7 years and the median 20 years (with a standard deviation of 17 years). The mean age of the Rwandan population reported in EICV2 (2005/06) was 21.4 years, which represented only a small increase from the mean age of 21.0 years in 2000/01. This suggests that the PICTURE Africa data of 2007 are broadly comparable with the national profile.

The majority of the interviewed respondents were female (70.7%), of whom 26.5 per cent were heads of household, 39.0 per cent a spouse of a head of household, and 21.6 per cent a daughter of a head of household. Close to 50 per cent of those interviewed were married.

Relevant change between 2007 and 2010

Financial poverty

The measure of poverty used in this study is based on the level of consumption below which individuals are considered poor or non-poor as computed in the EICV2 (2005/06) (NISR, 2006). This relative poverty line is derived through the cost of basic needs method and was set at 90,000 FRw (US$146) per adult per annum. The PICTURE Africa study uses this poverty line adjusted for the Adult Equivalent Scale. The differences between households in their size and composition are determined through the computation of the household size measured in adult equivalents and using the scale reproduced in Annex 7.1.

In the three years between 2007 and 2010, there was an apparent decline in monthly food expenditure and non-food expenditure per capita per month when estimated at current prices.[1] Food expenditure included items purchased and received as gifts and payment for services, and items produced by the households themselves. Non-food expenditure consisted of items purchased monthly. The survey also notes the dramatic increase of expenditure on household items between 2007 and 2010, and the large allocation of other expenditures in 2010. A possible scenario is that households became poorer after the crisis, thus leading to smaller budgets. Yet at the same time, households made further investments in household items.

Table 7.2 Monthly household (per capita) mean expenditure (FRw)

	2007 mean n = 408	*2010 mean n = 302*
Food expenditure	10,662.0	5,249.8
Non-food expenditure	6,437.6	3,613.3
Other expenditure	–	6,083.9
Household items	1,881.4	4,003.9

n = per household
Source: PICTURE Africa dataset

In an examination of Rwanda's poverty measures in Chapter 2 (May et al., 2014), the PPP$2.50 international poverty line was used (adjusted for domestic inflation rates to 2005 prices and converted to PPP$). Poverty in the country was then calculated based on monthly per capita household expenditure (PCE). Using this approach, the authors found Rwanda's money-metric

poverty status to be 53.3 per cent in 2007/08, rising to 61.1 per cent in 2010, representative of the poorest communities in East Africa. As mentioned above, this study uses the relative poverty line to distinguish the poor from the non-poor, which is realistic in terms of the country's calculated adult basic needs. Figure 7.1 shows the total household monthly expenditure, and food monthly expenditure, per poverty status in 2007 and 2010. There is a clear difference between poor and non-poor households on food and non-food mean expenditures in the sample. The poor spent more on non-food expenditure in 2010 than 2007/08, but the proportion of non-food spending over total spending decreased. The non-poor spent less in 2010 on non-food expenditures than in 2007, and the proportion of non-food costs over total household monthly expenditures also decreased. The household mean monthly food and total expenditures increased for both poor and non-poor households over time. These results show differences when household total expenditure is stratified versus household per capita expenditure (Figure 7.1 and Table 7.2). The mean household total expenditure increased over time, but the mean per capita total food and non-food expenditures decreased over time. Changes in the size of a household and those who generate income probably help to explain such differences.

In-depth examination of rural areas and major urban areas show that rural household expenditures in 2007 and 2010 were dramatically less than urban household expenditures (Figure 7.2). However rural households increased their food and non-food expenditures from 2007 to 2010, while the major urban households experienced decreases (slight drop in food but dramatic drop in non-food) during the same period. These results may be explained by

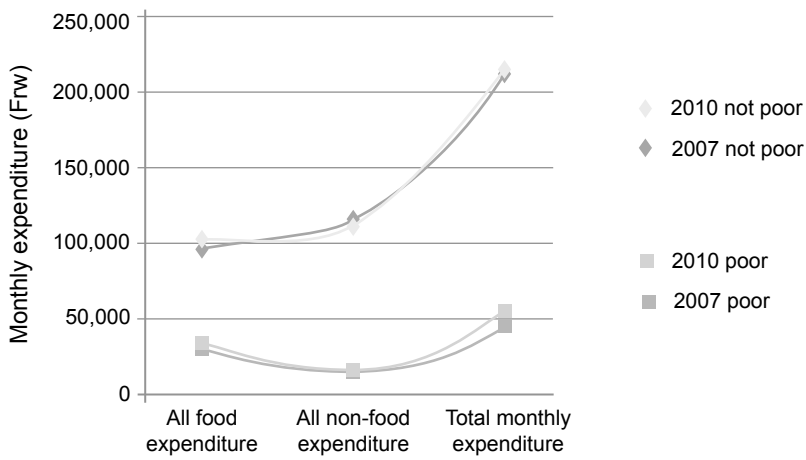

Figure 7.1 Total household monthly expenditure per poverty status (FRw)

Source: PICTURE Africa dataset

the high cost of energy, which takes up 14 per cent of all non-food expenditures for households (Republic of Rwanda, 2007). These increased costs may be the country's high transport or fuel costs during the food and fuel crisis. For urban areas, these higher fuel and food costs may see households adjust their behaviour through less frequent use of fuel by wealthier urban households. Rural households may have had less fuel costs in 2007/08 and thus did not need to adjust as dramatically as urban households. The rural household 2007 PICTURE Africa expenditure data seem close to the EICV2 (2005/06) average, with an undercount of non-food expenditure; however, over time, the rural and urban household expenditures moved away from the EICV2 national average.

Rwanda's household ICT status

Chapter 2 (May et al., 2014) shows Rwanda as ahead of other PICTURE study countries in ICT access to computers, emails, and landlines, which may be a result of the government's concerted effort to invest in major ICT infrastructure within the country. It also remains fairly ahead of Uganda and Tanzania on access to other ICTs in East Africa's poorest communities. Households in Rwanda also gained ICTs dramatically over the period 2007/08–2010. This next section looks more closely at the ICT transitions in the selected matched households (259 households were matched) between 2007 and 2010, which may help to explain the distinct changes in household item expenditures and non-food expenditures.

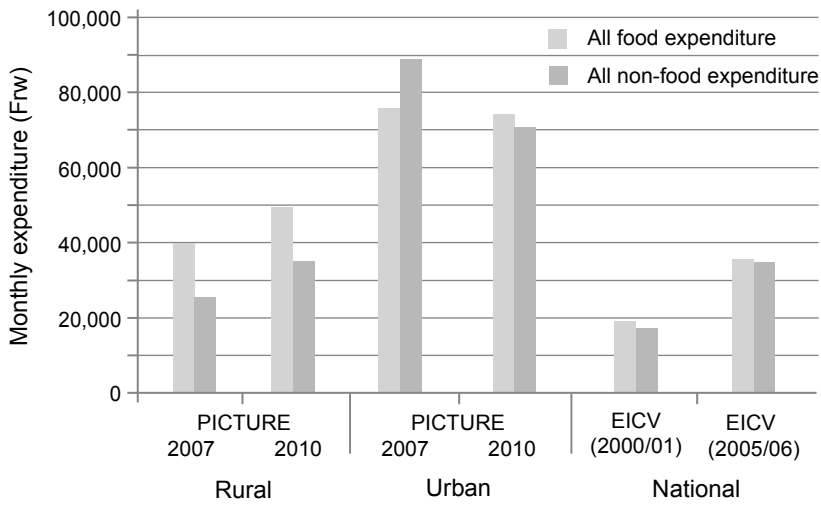

Figure 7.2 Total household monthly expenditure per survey location (FRw)

Source: PICTURE Africa dataset

Table 7.3 shows the changes in household access to ICT and mobiles between 2007 and 2010. The gain or loss of ICT was analysed using the multi-dimensional index of digital poverty with the following variables: per capita mobile access, email access, landline, television, and internet. ICT access appears nearly identical to the mobile phone access, so when households referred to ICTs, it is highly likely that they were referring to mobile phone access. In total, 47.9 per cent of matched households had ICT access in 2007 and 2010, 25.5 per cent of households had no ICT in either year, 24.3 per cent gained access between 2007 and 2010, and only 2.3 per cent lost access.

Table 7.3 Household changes in ICT and mobile access between 2007 and 2010

	ICTs		*Mobile access*	
	Frequency	*(%)*	*Frequency*	*(%)*
No ICT/Mobile	66	25.5	67	25.9
Always ICT/Mobile	124	47.9	122	47.1
Lost ICT/Mobile	6	2.3	6	2.3
Gained ICT/Mobile	63	24.3	64	24.7
Total	259	100.0	259	100.0

Source: PICTURE Africa dataset

Table 7.4 shows the changes in ICT access in matched households differentiated into rural and urban. Similar proportions of rural households either had no ICT in 2007 and 2010 or had ICT in both years. Far more urban than rural households had ICT in 2007. Slightly more rural than urban households gained ICT access over the period (27.0% compared to 21.9%), and more rural than urban households lost ICT access. A total of 58.1 per cent of rural households had ICTs by 2010, which may bring light to Figure 7.1, which shows rural household non-food expenditures increasing in 2010. In urban households, non-food expenditure dropped between 2007 and 2010, despite the gain (21.9%) in ICT. It may be that those who always had ICT and those who gained ICT spent substantially less on average on their mobile phones than in 2007. The period also saw a drop in costs of mobile airtime and services.

When ICT status was analysed in poor and non-poor matched households, the results were similar to those comparing rural with urban households (Table 7.5). As expected, a majority of non-poor respondents had ICT in 2007 and 2010, and most of those who had no ICT in 2007 gained access by 2010 (to give 93%). One-third of poor respondents had no ICT in 2007 or 2010, but 25 per cent gained access to ICT in this period, a similar proportion to the non-poor group. Thus even during a period of food and fuel price rises, households were finding ways to obtain or retain their ICT. Non-poor households had the greatest access to ICT and a marked gain over the period, even though their non-food expenditures dropped.

Table 7.4 Changes in ICT status between 2007 and 2010 per survey location

	Urban		*Rural*	
	Frequency	*(%)*	*Frequency*	*(%)*
No ICT	20	14.6	46	37.7
Always ICT	86	62.8	38	31.1
Lost ICT	1	0.7	5	4.1
Gained ICT	30	21.9	33	27.0
Total	137	100.0	122	100.0

Source: PICTURE Africa dataset

Table 7.5 Changes in ICT status between 2007 and 2010 per poverty status

	Not poor		*Poor*	
	Frequency	*(%)*	*Frequency*	*(%)*
No ICT	6	5.9	60	38.5
Always ICT	72	70.6	52	33.3
Lost ICT	1	1.0	5	3.2
Gained ICT	23	22.5	39	25.0
TOTAL	102	100.0	156	100.0

Source: PICTURE Africa dataset

The results of analysis of change in ICT status according to gender of household head are shown in Tables 7.6 and 7.7. Proportionally, females had slightly greater gains in ICT than males between 2007 and 2010, but losses.

Table 7.6 Households that gained ICT between 2007 and 2010 per gender of household head

		Frequency	*(%)*
Male	No	149	77.2
	Yes	44	22.8
	Total	193	100.0
Female	No	48	71.6
	Yes	19	28.4
	Total	67	100.0

Source: PICTURE Africa dataset

Table 7.7 Households that lost ICT between 2007 and 2010 per gender of household head

		Frequency	*(%)*
Male	No	189	97.9
	Yes	4	2.1
	Total	193	100.0
Female	No	65	97.0
	Yes	2	3.6
	Total	67	100.0

Source: PICTURE Africa dataset

Vulnerability

The study looked at changes over time in the relationship between the mobile phone access indicator and the vulnerability indicator on negative shocks (self-reported). Table 7.8 shows the results of a cross-sectional look at households who had experienced negative shocks in the last two years in 2007 and 2010. Just over 50 per cent of households had experienced one or more shocks in the last two years before both 2007 and 2010. This may indicate that households were experiencing shocks regardless of the food crisis.

In 2007, a similar proportion of the population with mobiles or without mobiles had experienced one or more shocks or no shocks. Between 2007 and 2010, there was a decrease in the proportion of total population of those with no mobile access and no shocks, and a more marked decrease of those with no mobile access and did experience shock, both of which were at least in part due to the decrease in the proportion without mobile access. Similarly, the proportions of total population with a mobile who did not experience shock, or did experience shock, both increased, although the increase in those experiencing shock was slightly greater. A slightly smaller proportion of those who did not own a mobile (52% compared to 57%), and a slightly greater proportion of those who did own a mobile (54% compared to 49%), experienced shock in 2010 compared to 2007. Overall, the results show that the same proportion of households (just over half) experienced shock in 2007 and 2010, but shock did not appear to be related to mobile phone access.

Table 7.9 shows the proportion of negative shocks experienced by the poor and non-poor in the two years before 2007 and 2010. The shock levels in both groups were similar in 2007 and 2010, with a higher proportion of the poor reporting shocks in both years.

Table 7.8 Number of households reporting shock in 2007 and 2010 per mobile phone access

	2007			*2010*		
	Frequency	*(%)*	*(%)*[1]	*Frequency*	*(%)*	*(%)*[1]
No mobile / no shock	57	21.7		38	13.7	
No mobile / yes shock	74	28.1		41	14.8	
% without mobile who experienced shock			56.5			51.9
Yes mobile / no shock	68	25.9		92	33.2	
Yes mobile / yes shock	64	24.3		106	38.2	
% with mobile who experienced shock			*48.5*			53.5
Total	*263*	*100.0*		*277*	*100.0*	

Note: Shock is indicated as one or more shock experience in the preceding two years
1 The percentages in this column are derived by dividing the frequency in the row above ('no mobile / yes shock' and 'yes mobile / yes shock' by total frequency.
Source: PICTURE Africa dataset

Table 7.9 Number of households reporting shock in 2007 and 2010 per poverty status

		2007		*2010*	
		Frequency	*(%)*	*Frequency*	*(%)*
Poverty status	Non-poor	55	39.9	58	39.5
	Poor	83	60.1	89	60.5
	Total	138	100.0	147	100.0

Note: Shock is indicated as one or more shock experience in the preceding two years
Source: PICTURE Africa dataset

These descriptive findings of the PICTURE Africa Rwanda households give one a glimpse within the country's poor communities. There appear to be major differences in household expenditures between non-poor and poor households as well as between rural and urban households. There is also a diversity in change over time between gains or retention of ICTs within the household depending on location, household poverty level, and gender of household head. We also observed household vulnerability level changes over time given mobile phone access. Overall, this gives a more comprehensive

sense of the changing lives of Rwandan households within the context of ICT proliferation and times of global crisis.

Conclusions and recommendations

Rwanda provides an interesting case of what occurs during multiple food and fuel price crises amongst vulnerable groups, particularly on ICT gains and food and non-food spending over time. Those households based in rural areas and/or identified as poor had similar patterns of food and non-food spending. In other words, rural and poor households both experienced slight increases in their food and non-food expenditures between 2007 and 2010. In contrast, urban and non-poor households dramatically dropped their non-food expenditures during the same period. In both poor and non-poor households, ICT and mobile access were either being retained or gained between 2007 and 2010. The data on poor and/or rural households who retained or gained mobile phone access by 2010 seem to correspond with non-food expenditure increases by 2010. These expenditure increases can be related to the increase in ICT between 2007 and 2010. Urban and/or non-poor households, showed decreases in non-food expenditure but retention or gain of ICT access by 2010, which could result from the lower costs of mobile phone services (e.g. airtime). In both 2007 and 2010, the majority of households with no ICT were poor households. In terms of gender, similar proportions of men and women heads of household gained or lost access to ICTs between 2007 and 2010. Finally, the survey found that a majority of poor households had experienced one or more shocks in the preceding two years, but only a minority of non-poor households. No clear relationship was seen between change in experience of shocks, and change in mobile phone access. This supports the notion that continuous shocks affect Rwanda's poorest communities, but these shocks have little relation to their mobile phone access. Rather, coping with everyday shocks, including those resulting from the food crisis, is part of daily life. Households are adjusting their limited budgets accordingly, within the context of greater availability of digital products and ongoing incidences of vulnerability. Further work may need to be done to re-think which ICT indicators can best match vulnerability indicators to give a better sense of well-being amongst poor households.

The findings suggest that households make difficult spending decisions in response to ongoing shocks, including during the food and fuel crisis. Every expenditure, from quantity of food consumption to choices of non-food, must be carefully considered, and values for food and non-food items must be assessed within the confines of limited resources. This study has been able to describe and reflect on the various spending actions taken by Rwandan households. The evidence reflects the gain and retention of ICTs during the 2007–10 time period in the midst of limited budgets and the ongoing insecure lives of the poor.

Independently of East African households' efforts to manage through the difficult period of 2007/08, governments and institutions are also challenged to improve their agricultural, land, and economic policies to better mitigate the effects of the food crisis and other external shocks within their local populations. At the micro-level, this study helps understanding of food spending and the importance of mobile phone access within a context of crisis. Through such understanding, one can move forward to developing innovative government interventions which consider how best to support the lives of the poorest, especially during such external crisis. Given the expansion of ICTs and their access to the poor, further work can be done to examine whether ICTs can play a role in this process. Furthermore, Rwanda still has one of the highest costs of ICTs (mobile phone and broadband) compared to the other three East African countries in the PICTURE Africa study. Lowering ICT costs would give the poor a greater chance to participate, given their limited budgets. At the global level, transparent, fair, and open global trade that enhances the efficiency of agricultural markets should be maintained. Overall the changing environment both at the ecological and digital level will need to be monitored closely particularly on how these changes may affect the lives of the poor.

Notes

1 A limitation to the 2007 survey was that 'other expenditure' allocation information was not collected. This conclusion therefore must be taken with caution.

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Annex 7.1 Adult equivalence scale used for the construction of the consumption indicator

Age range	*Gender*	
	Male	*Female*
Less than 1 year	0.41	0.41
1 to 3 years	0.56	0.56
4 to 6 years	0.76	0.76
7 to 9 years	0.91	0.91
10 to 12 years	0.97	1.08
13 to 15 years	0.97	1.13
16 to 19 years	1.02	1.05
20 to 39 years	1.00	1.00
40 to 49 years	0.95	0.95
50 to 59 years	0.90	0.90
60 to 69 years	0.80	0.80
More than 70 years	0.70	0.70

Source: McKay and Greenwell, 2007