

Household, Small Business & Public Institutional e-Access & Usage Survey 2011

RIA seeks to build an African evidence and knowledge base in support of ICT policy and regulatory processes, and to monitor and review policy and regulatory developments on the continent. Part of this effort is the generation of relevant information for policy makers and regulators. The RIA 2011 e-Access & Usage Survey delivers nationally representative indicators on household, individual and small business level. The survey uses national census sampling frames in co-operation with National Statistical Offices to deliver crucial data in a cost effective way.

RIA Survey Methodology Brief

September 2011

Lack of Data

Decision relevant data for ICT policy making and regulation is often not available in Africa.

Partnership on Measuring ICT for Development

The Survey delivers all indicators required by the Partnership for household, individuals, and businesses.

Cost Effective

Using Enumerator Areas (EA) of National census sample frames and sampling households, small business and institutions simultaneously minimises costs.

Scope

Apart from delivering ICT indicators required by international bodies the survey delivers data and analysis for several regulatory functions such as pricing regulation, number portability and universal access.

Comprehensive Interaction

The survey explains interactions between households, individuals and businesses on ICT access and usage.

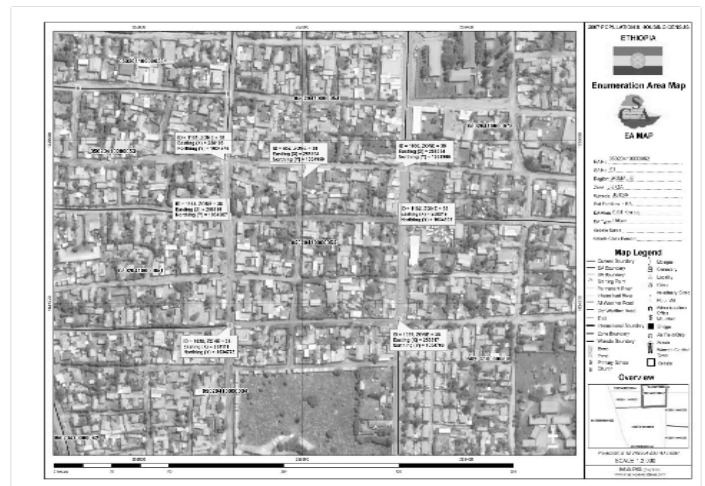
Introduction

This document details the methodology for the next RIA e-Access & Usage survey that delivers nationally representative results for households, individuals, businesses and institutions. Using Enumerator Areas (EA) of National census sample frames as primary sampling units and sampling households, business and institutions from created listings simultaneously allows to survey three very different users groups during a single survey at a minimal cost.

Partnership on Measuring ICT for Development

The RIA Survey delivers all indicators required by the Partnership for Measuring ICTs for household, individuals, businesses and institutions. The household, individual, business and institutional ICT indicators will be complemented by various aspects with relevance for policy makers and regulators:

- Untapped demand: willingness and ability to pay for services of non-users
- Income elasticity of demand of users
- Multiple SIM card ownership
- Internet adoption: with focus on mobile internet
- Mobile transfer adoption and m-banking
- Employment generation and GDP contribution of SMEs
- ICT access and usage of informal operators (individuals trading without physical presence and any form of registration)
- ICT Access function of public institutions including clinics and educational institutions.



Example of an Urban EA in Ethiopia

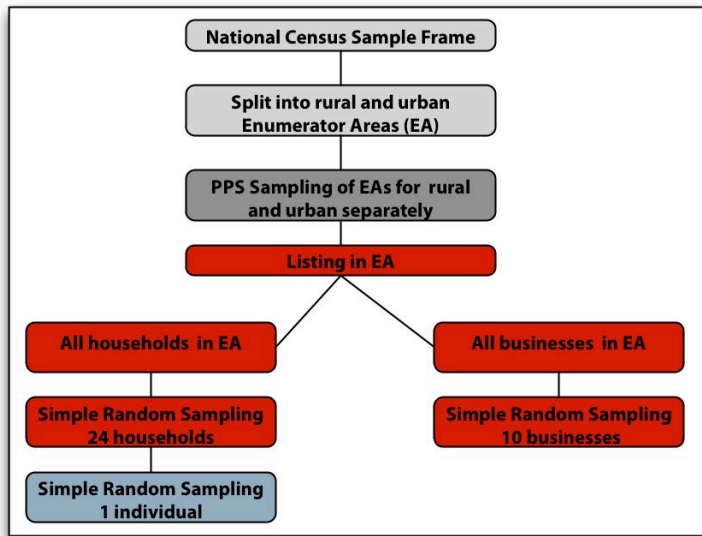
Sampling

The random sampling will be performed in four steps for households, businesses and public institutions, and five steps for individuals.

- Step 1: The national census sample frames will be split into urban and rural Enumerator areas (EAs).
- Step 2: EAs will be sampled for each stratum using probability proportional to size (PPS).

- Step 3: For each EA three listings will be compiled, one for households, businesses and public institutions each. The listings serve as sample frame for the simple random sections.
- Step 4: 24 Households and 10 small businesses will be sampled using simple random sample for each selected EA. All public institutions in the EA will be interviewed.
- Step 5: From all household members 16 years or older or visitor staying the night at the house one will be randomly selected based on simple random sampling.

	HH Sample		Total
	HH Sample	Business Sample	
Cameroon	1 200	500	1 700
Ethiopia	1 600	600	2 200
Ghana	1 200	500	1 700
Kenya	1 200	500	1 700
Mozambique	1 200	500	1 700
Namibia	900	400	1 300
Nigeria	1 600	600	2 200
Rwanda	1 200	500	1 700
South Africa	1 600	600	2 200
Tanzania	1 200	500	1 700
Uganda	1 200	500	1 700
Total	14 100	5 700	19 800



Sample Size

The desired level of accuracy for the survey was set to a confidence level of 95% and an absolute precision (relative margin of error) of 5%. The population proportion P was set conservatively to 0.5 which yields the largest sample size (Lwanga & Lemeshow, 1991). The minimum sample size was determined by the following equation (Rea & Parker, 1997):

$$n = \left(\frac{Z_a \sqrt{p(1-p)}}{C_p} \right)^2 = \left(\frac{1.96 \sqrt{0.5(1-0.5)}}{0.05} \right)^2 = 384$$

Inserting the parameters for the survey yields the minimum sample size for simple random sampling. Due to the sampling method chosen for the survey the minimum sample size has to be multiplied by the design effect variable (Lwanga & Lemeshow, 1991). In the absence of empirical data from previous surveys that would have suggested a differed value, the default value of two was chosen for the design effect (UNSD, 2005). This yields then a minimum sample size of 768 per country for households and individuals. The actual sample size for countries is slightly larger than the minimum requirement to compensate for clustering effects and have a wide enough spread of EAs through out a country.

For the businesses a design effect of 1 is assumed leading to a minimum sample of 384 businesses for each country.

All institutions in selected EAs will be sampled. The expected responses would be around 150 for 50 EAs. The responses are nationally representative at an absolute precision (relative margin of error) of 10% and a minimum sample size of 97 institutions.

$$n = \left(\frac{1.96 \sqrt{0.5(1-0.5)}}{0.1} \right)^2 = 96.4$$

Survey Characteristics	Household & Individuals	Businesses
Target Population	All households Individuals 16 years or older.	all businesses
Domains	1 = national level	
Tabulation groups	Urban, Rural	National
Oversampling	Urban 60%	Rural 40%
Clustering	Enumerator Areas (EA) national Census	
None Response	Random substitution	
Sample Frame	Census sample from NSO	
Confidence Level	95%	95%
Design Factor	2	1
Absolute precision	5%	5%
Population Proportion	0.5, for maximum sample size	
Minimum Sample Size	768	384

Weighting

Four weights will be constructed, for households, individuals, small businesses and public institutions. The weights are based on the inverse selection probabilities¹ and gross up the data to national level when applied.

$$\text{Household weight: } HH_w = DW \frac{1}{P_{HH} * P_{EA}}$$

$$\text{Individual weight: } IND_w = DW \frac{1}{P_{HH} * P_{EA} * P_I}$$

$$\text{Business Weight: } Bus_w = DW \frac{1}{P_{Bus} * P_{EA}}$$

$$\text{Household Selection Probability: } P_{HH} = \frac{n}{HH_{EA}}$$

¹ See UNSD (2005) page 119 for a detailed discussion on sampling weights.

$$EA \text{ Selection Probability: } P_{EA} = m \frac{HH_{EA}}{HH_{STRATA}}$$

$$\text{Individual selection Probability: } P_i = \frac{1}{HH_{m15+}}$$

$$\text{Business Selection Probability: } P_{BUS} = \frac{q}{BUS_{EA}}$$

DW = design weight compensation for over-sampling of major urban and other urban EAs and under-sampling of rural EAs;

HH_{EA} = number of households in selected EA based on information of last census or updated listing by field team;

HH_{STRATA} = number of households in strata (major urban, other urban, rural);

HH_{m15+} = number of household members or visitors 15 years or older;

m = target number of EAs for each strata, (major urban, other urban, rural);

n = target number of households in EA;

q = target number of businesses in EA;

i = number of household members interviewed.

The target number of households in each EA varied from country to country. Usually 24 households were to be selected from each EA. Some countries, like Tanzania, preferred to reduce it to 15 households in order to increase the spread of EAs across the country.

Survey Definitions	
Household	Constitutes a person or group of persons, irrespective of whether related or not, who normally live together in the same housing unit or group of housing units and have common cooking arrangements.
Head of household	A head of a household is a person who economically supports or manages the household or, for reasons of age or respect, is considered as head by members of the household, or declares himself as head of a household. The head of a household could be male or female.
Member of a household	<ul style="list-style-type: none"> • All persons who lived and ate with the household for at least six months including those who were not within the household at the time of the survey and were expected to be absent from the household for less than six months. • All guests and visitors who ate and stayed with the household for six months and more. • Housemaids, guards, baby-sitters, etc. who lived and ate with the household even for less than six months.
Businesses	Any business with a physical presence in the EA, the intent to make profit
Institutions	Any institutions located within an EA including schools, clinics, police stations or any other government office.

Conclusion

The approach presented here delivers for the first time ever nationally representative ICT indicator for businesses including the informal sector. Informal businesses will be covered by the business survey, informal operators by an SME module in the household questionnaire. The survey covers at the same time institutions such as schools and clinics. The comprehensive picture emerging from this combined with household and individual indicators will provide the data required for evidence based policy making and regulation in Africa.

References

- Lwanga, S. and Lemeshow, S. (1991): Sample Size Determination in Health Studies – A Practical Manual, World Health Organisation, Geneva.
- Rea, L. and Parker, R. (1997): Designing and Conducting Survey Research – A Comprehensive Guide, Jossey-Bass Publishers, San Francisco.
- Thompson, S. (2002): Sampling, Second Edition, Wiley Series in Probability and Statistics.
- UNSD (2005): Designing Household Surveys Samples: Practical Guidelines, United Nations, New York.