National ICT Survey Report

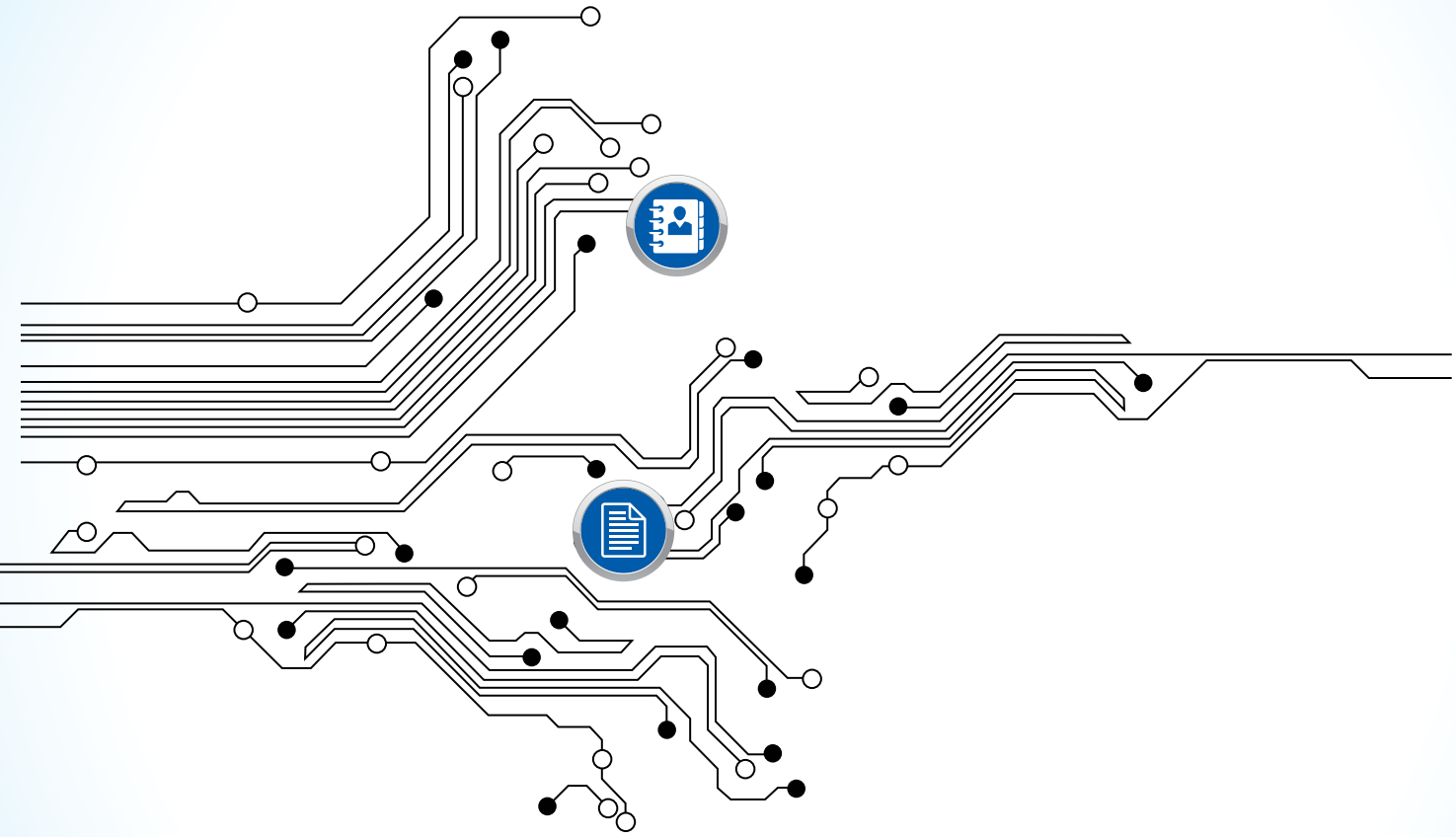
Communications Commission of Kenya

KNBS
KENYA NATIONAL BUREAU OF STATISTICS
Keeping you informed

PREAMBLE

The National ICT Survey was undertaken in 2010 and is presented in two sections. Section I presents a report of the National ICT Survey undertaken by the Kenya National Bureau of Statistics (KNBS). Section II is an Analysis of the National ICT Survey by Apoyo Consultoria on behalf of the Communications Commission of Kenya (CCK). The KNBS report provides a descriptive analysis of the Survey while Section II of the report provides detailed analysis of the ICT situation based on the intervening variables in different regions of Kenya as presented by the ICT consultants.

SECTION I: REPORT OF THE NATIONAL ICT SURVEY IN KENYA



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ACRONYMS/ABBREVIATIONS

BPO	Business Process Outsourcing
CCK	Communications Commission of Kenya
CSPRO	Census and Survey Processing System
DVD	Digital Video Disc
DNS	Domain Name System
DK	Don't Know
EAC	East African Community
EPSEM	Equal Probability Selection Method
GDP	Gross Domestics Product
GoK	Government of Kenya
ICT	Information and Communication Technology
IP	Internet Protocol
ISPs	Internet Service Providers
ITU	International Telecommunication Union
KBC	Kenya Broadcasting Corporation
KDHS	Kenya Demographic and Health Survey
KNBS	Kenya National Bureau of Statistics
KP&TC	Kenya Posts and Telecommunications Corporation
KShs	Kenya Shillings
LAN	Local Area Network
MDGs	Millennium Development Goals
MTP	Medium Term Plan
NASSEP	National Sample Survey and Evaluation Programme
NS	Not Stated
PC	Personal Computer
PCK	Postal Corporation of Kenya
PEV	Post Election Violence
PPS	Probability Proportional to Size
RAs	Research Assistants
SPSS	Statistical Package for Social Sciences
TKL	Telkom Kenya Limited
TV	Television
VSAT	Very Small Aperture Terminal
WSIS	World Summit on the Information Society

ACKNOWLEDGEMENT

This report presents results of the National ICT Survey conducted by the Kenya National Bureau of Statistics [KNBS] in liaison with the Communications Commission of Kenya [CCK]. The survey was carried out over a period of 30 days.

The ICT Survey was designed to capture data that would be used to update statistics on ICTs sub-sectors including: computers, telephones – both fixed line and mobile – television and radio, with regard to among others, access, ownership, usage and cost.

The Bureau wishes to thank CCK for the financial support extended towards the survey. KNBS is grateful to Mr. Matano Ndaro - Director Competition Tariffs and Market Analysis (CTMA) and his team, (Susan Mochache, Paul Kiage, Veronica Kimani and Godfrey Muhatia) for the support they lent this study. Further, the Bureau would like to acknowledge the input of Apoyo Consultoria who undertook detailed analysis of the ICT database on behalf of the CCK.

Special thanks go to the data collection team, the supervisors as well as the research assistants.

I sincerely thank the KNBS team who wrote this report, including Cleophas Kiio, Samuel Kipruto, Patrick Mwaniki, Benjamin Muchiri, Samuel Njuru, Silas Mulwa, Rogers Mumo and Katunge Kiilu.

Mr. Zachary Mwangi

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Kenya National Bureau of Statistics

Executive Summary

Household Characteristics

In researching ICT penetration rates of a country, it is necessary to look at the target population demographic characteristics that facilitate use, access and ownership of the ICT facilities and equipment. As such, the ICT survey sought information on the general characteristics of the sampled population, including composition by age and sex, household size, education, employment, literacy, disability and source of electricity to households.

Employment and household size in many cases determine the household disposable income which in turn determines whether individuals in households can afford radios, TVs, computers, the internet and other ICT Equipment and facilities. Education contributes to the development of capacity-building for effective use of the ICT facilities, especially the internet. For the development and maintenance of ICT networks it is important to have other infrastructure like electricity, water, road, rail, and air transport systems in place. In particular, electricity is a key driver of ICTs and therefore the survey sought to establish to what extent it affects penetration rates of ICT in the country. Other characteristics like age, sex and disability are important in informing if certain sections of the society are disadvantaged and, therefore, putting the necessary policies in place to alleviate any bias.

Access, Usage and Ownership of ICT facilities by Households and individuals

For many years now, ICT has been at the centre stage of economic development, notably through rapid technological advancement, facilitating speedy access of ideas and experiences, and prompt exchange of information. In today's world, access, usage and ownership of ICT are fundamental in linking communities, facilitating businesses and empowering communities socially and economically. Enhancement of access to information and communications services in rural, remote and underserved areas is, therefore, crucial to accelerating development.

The results of the survey show that in most cases there is correlation between access and usage on one hand and sex, education, and age on the other. Among the salient features of the findings is that use and access to ICT equipment and facilities was more widespread among the youth aged between 20 and 34.

ICT in Education

Information and Communication technologies (ICTs) - which include radio and television as well as emergent digital technologies such as computers and the internet – have been touted as potentially powerful enabling tools for educational change and reform. More than half of the household population attending ICT-related courses are in primary school level while 32 per cent are in secondary. Households that are headed by males are more likely to use electricity from mains, generator or solar than those headed by females. The results of the survey show that the higher the education levels of the head of household, the higher the likelihood of using electricity from the main grid. The positive impact of education on use of electricity is more visible at the attainment of secondary or higher education levels. This leads to better use of the ICT equipment.

The survey reveals that 33.1 per cent household members aged above three years own a radio, 18.2 per cent own a computer, 15.0 per cent of households own a Television (TV) set and 7.4 per cent have internet connectivity. The ownership of the ICT equipment varies across the provinces as well as across ages. Television and computer usage is common among residents of Nairobi Province. The results further show that radio usage is predominant among households headed by a person with pre-primary and primary level of education. Television usage is common among households headed by a person who has attained secondary level of education while computers are widely used in households headed by a person with higher education levels above secondary, such as university.

CHAPTER 1: INTRODUCTION

1.0 Background

For many years, the world has utilized ICTs for productivity in the manufacturing and service sector. However, the last decade has witnessed an explosion in the advancement of ICT. The benefits associated with the use of modern technology have given ICT prominence in the eyes of the public and decision makers. Through the use of modern technology, communication has become more reliable, faster and affordable. It is now possible to transmit data more effectively and at minimal costs. Similarly, the manufacturing sector has achieved higher outputs through the use of automated production lines.

In order to maximize and harness the benefits of these technologies, it is imperative to regularly take stock of the country's level of development and use of the ICTs. In most instances, the supply-side data can be availed through use of administrative records from providers and the regulatory authorities. However, the demand-side statistics can only be sourced through user-targeted studies with specific objectives. Currently, Kenya does not have comprehensive data on the developments in the ICT sector, particularly at the household level. This calls for development of appropriate sector indicators for both academic and commercial purposes.

1.1 The National ICT Study

In an effort to address the ICT data challenges, the Communications Commission of Kenya (CCK) partnered with Kenya National Bureau of Statistics (KNBS) to undertake a comprehensive National ICT Survey. This was planned and executed during the months of May and June 2010. The main objective of the study was to establish ICT access and usage at the household and individual levels in the country. The findings of the survey will serve to inform formulation of progressive ICT access programmes, projects and strategies in addition to providing input into the ICT Access Gaps study.

1.2 Objectives

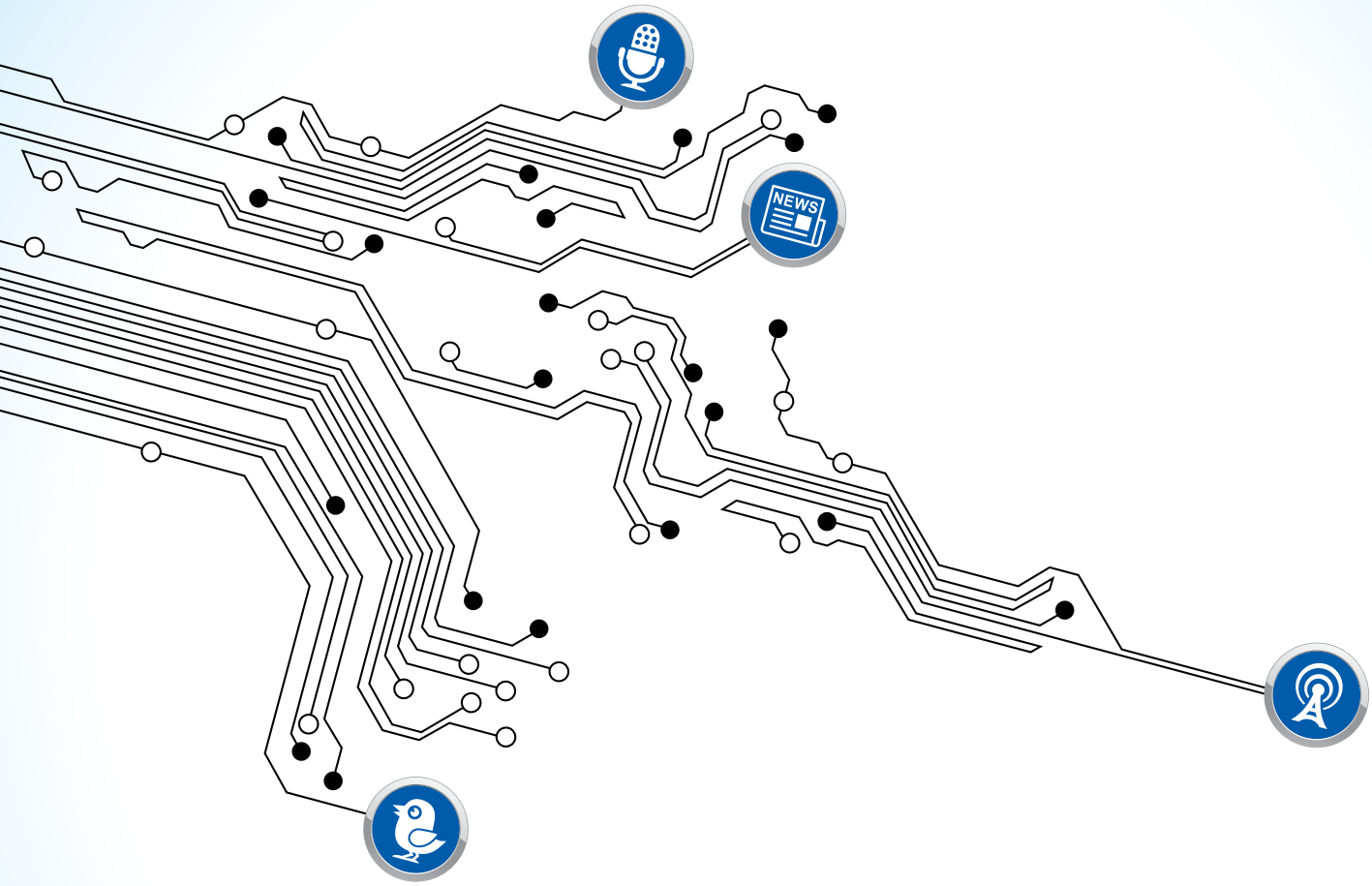
The main objective of the study was to collect, collate and analyse data relating to ICT access and usage by various categorizations in Kenya. The survey captured data and information on critical ICT indicators as defined by international bodies such as the International Telecommunication Union (ITU). These indicators focused on household and individuals. The data was disaggregated by age, gender, administrative regions, rural and urban locations. The specific objectives of the study were to:

1. Obtain socio-economic information with a view to understanding usage patterns of ICT services;
2. Collect, collate and analyze ICT statistics in line with ICT indicators;
3. Evaluate the factors that will have the greatest impact in ensuring access and usage of ICTs and;
4. Develop a database on access and usage of ICT in Kenya.

1.3 Justification

The Government of Kenya, has identified ICT as a key enabler to the attainment of the goals and aspirations of the Vision 2030-the country's economic blue print. The thrust of the Vision with regard to the ICT sector is, therefore, to trasform Kenya into a truly knowledge and information-based economy by enabling access to quality, affordable and reliable ICT services in the country. An integral step in achieving this objective is to establish the ICT access levels in the country, determine ICT access gaps that need to be served and evaluate barriers to ICT access such as costs, literacy levels and technological barriers. In furtherance of this objective, the CCK has committed, in its 2008-2013 Strategic Plan, to undertake a comprehensive household survey to accurately establish the ICT penetration levels in the country. It is estimated that the outcome of this study will inform the development of strategies to accelerate access to ICT services in the country that will lay the foundation for harnessing the true potential of the ICT sector in Kenya. In particular, the study will identify the ICT access gaps in the country with a view to developing targeted policy interventions to accelerate ICT access in the country.

Furthermore, the effective roll-out of ICT services in the country is predicated upon reliable and accurate ICT data and information including access demographics, and establishment of access costs. This study, therefore, provides the basis for ICT household data that can formally be employed in monitoring the sector's development towards achieving the Vision 2030.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CHAPTER 2: SURVEY ORGANIZATION AND METHODOLOGY

2.0 Survey Organization

The Kenya National Bureau of Statistics (KNBS) served as the implementing agency on behalf of CCK and played a primary role in the planning, survey execution and analysis, and report preparation. As the implementing agency, KNBS was responsible for all operational matters, including planning and conducting fieldwork as well as processing of collected data. The Bureau also co-ordinated the writing of the basic report. The day-to-day technical operations of the survey including identification and training of field and data processing staff, and the supervision of the office and field operations were supervised by KNBS.

To undertake the Survey, different categories of personnel were identified and trained. These included Lead Coordinator, Regional Coordinators, Supervisors and Research Assistants (RAs). The criteria used to select RAs was academic qualifications. The minimum qualification was a diploma in any academic field. In order to execute the survey, KNBS segmented the country into five operational regions with 17 field teams constituted based on the regions and local language preference.

Each team comprised of four research assistants, one supervisor and a driver. The Field Supervisors were responsible for at least one team. The teams were assigned to operate in areas where their local languages are spoken. The supervisors were answerable to the Project Team Leader (The Lead Co-Coordinator) through designated Regional Co-ordinators.

2.1 Sample Design and Weighting

2.1.1 The Sample Frame

The National Sample Survey and Evaluation Programme (NASSEP IV) maintained by KNBS was used as the sampling frame. The frame has 1,800 clusters spread all over the country, and covers all socio-economic classes. The frame is thus able to get a suitable and representative sample of the population.

2.1.2 Survey Domains

The survey was distributed into four domains, namely:

i. National,
ii. Major Urban areas,
iii. Other Urban areas, and
iv. Rural areas

The major urban towns included Nairobi, Thika, Mombasa, Kisumu, Nakuru and Eldoret. All other areas defined as urban by KNBS but fall outside the major municipalities above were categorized as 'other urban areas'. The rural domain was further sub-divided into their respective provinces, excluding Nairobi which is purely urban.

2.1.3 Estimation of Sample Size

Among the indicators of this study include the percentage of the population that uses the internet, e-mail, computers, mobile phones and fax machines. The mobile phone was used to calculate the sample size because of the device's common usage by both the urban and rural population.

The sample size was estimated using the formula

$$n = \frac{z^2 pqd}{e^2} \quad \text{..... (1)}$$

where,

n = the desired sample size,

z = the critical value or the confidence coefficient or simply called abscissa of the normal distribution curve and cuts off an area of 0.05 at the tails

p = the prevalence rate for use of mobile phones,

$q = 1-p$

d = the design effect and

e = the allowed margin of error

In calculating the sample size, there was need to adjust for possible non-response and the design effect. This was necessitated by the fact that under simple random sampling, the standard error of the estimates would be lower than the standard error in the case of the two-stage cluster sample design, which the NASSEP frame uses. Accordingly, a 10% adjustment was done after the sample size calculation to cater for the possible non-response.

2.1.4 Stratification

For the 'rural' component, the districts that displayed identical socio-cultural and economic conditions were pooled together to create strata from which a representative set of districts was selected to represent the group of such districts. A total of 42 such stratifications were done and one district in each categorization was selected.

The major urban areas of the country namely Nairobi, Mombasa, Kisumu, Nakuru, Eldoret and Thika were all sub-stratified into the following five sub-strata based on perceived levels of income:

1. Upper income
2. Lower Upper
3. Middle
4. Lower Middle and
5. Lower

In this survey, all the six 'major urban' arears are included while just a few of the 'other urban areas' are selected depending on their population (household) distribution.

2.1.5 Selection of the Clusters for the Survey

The selection of the sample clusters was done systematically using the Equal Probability Selection method (EPSEM). Since NASSEP IV was developed using Probability Proportional to Size (PPS) method, the resulting sample retains its properties. The selection was done independently within the districts and the urban /rural sub-stratum.

2.1.6 Selection of the Households

From each selected cluster, an equal number of 15 households were selected systematically, with a random start. The systematic sampling method was adopted as it enables the distribution of the sample across the cluster evenly and yields good estimates for the population parameters.

Selection of the households was done at the office and assigned to the Research Assistants, with strictly no allowance for replacement of non-responding households.

2.1.7 Weighting the Sample Data

The resulting sample would not be self weighting owing to the unproportional allocation of the sample into the domains. Weights were developed to account for the selection probabilities. The weights were developed using the design weights of the clusters, the response levels and the number of clusters in the survey.

In the computation process, adjustment was done for cluster and household non-response. The generation of the cluster weights is the product of sample cluster design weight, household and cluster response adjustment factors. The mathematical formulation is given as follows:

$$W_{hi} = D_{hi} X \frac{S_{hi}}{l_{hi}} X \frac{C_h}{c_h} \quad \text{.....} \quad (2)$$

where,

W_{hi}= Overall cluster weight for the i-th cluster in the h-th stratum

D_{hi}= Sample cluster design weight obtained from cluster selection probabilities for the i-th cluster in the h-th stratum

S_{hi} = Number of listed households in the i-th cluster in the h-th stratum

l_{hi} = Number of responding households in i-th cluster in the h-th stratum

C_h = Number of operating clusters in h-th stratum

c_h = Number of selected clusters in the h-th stratum

The weights were applied to each individual item to obtain estimates on any given variable in a specified domain or category.

21.8 Estimation of the Population Parameters

The estimates for the population indicators may be proportions, ratios (means) or totals. The estimation process involved multiplication of the weighting factor with the sample value and summing up the products.

The population estimates included totals and ratios. In the estimation of totals, sample weights were applied to obtain national and domain totals using the result:

$$\hat{Y} = \sum W_{hi} Y_{hij} \quad \text{.....} \quad (3)$$

where,

$\hat{Y}$ = Estimate of the total of the variable Y;

W_{hi} = weight of the i-th cluster in the h-th domain.

Y_{hij} = observed value of the variable Y in the h-th domain in the i-th cluster on the j-th individual or household

For a ratio estimate, the estimates for Y and X were weighted before the estimation of the ratio using the result:

$$R = \frac{\hat{Y}}{\hat{X}}$$

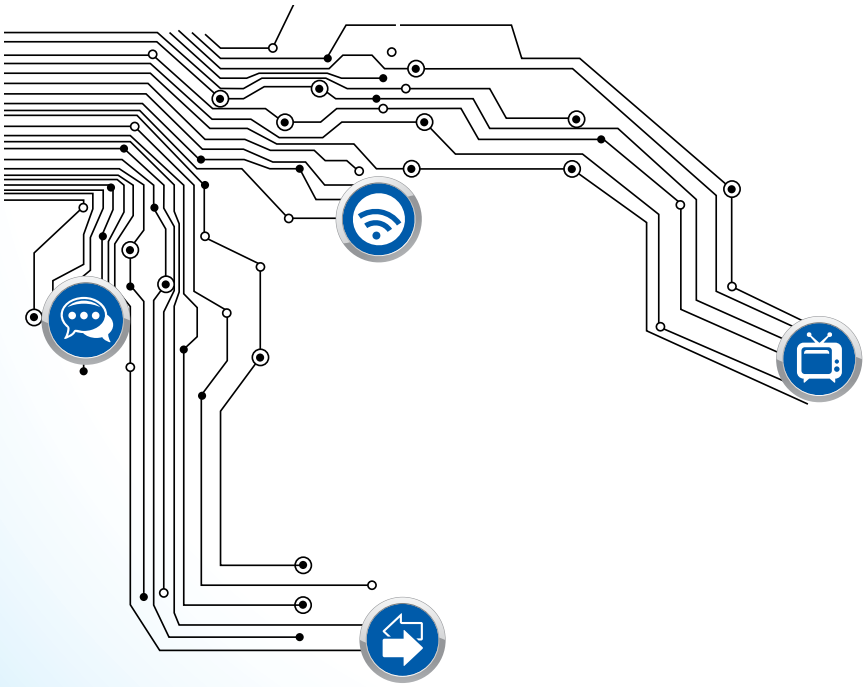
2.1.9 Allocation of the Sample to Domains

The distribution of the number of households in the survey to the clusters was determined using the sampling fraction within the clusters. The mean size of the clusters in NASSEP IV is 100 households. A 10% sample of the households in each cluster was considered sufficient. However, cluster sizes were not uniform with the average size being 100 households. Some clusters had sizes falling below 100 while others exceeded the mean size of 100 households. To avoid the complications that would arise by strictly adhering to 10% of the cluster, a uniform number of 15 households from each cluster was selected.

Due to the large differences in household composition in the domains, a proportional allocation would have resulted into small un-reliable sample in 'other urban' domain. An alternative power allocation method was used to allocate the sample of 8,295 into the strata. Further, a square root allocation was used to allocate the sample of 6,075 of rural domain into their respective sub-domains (provinces). The allocation of the sample of 'major urban' and 'other urban' domains was done proportionately to their total number of households.

2.2 Selection of Household Businesses

During the survey, the sampled households were asked about business ownership by household members. The business module of the questionnaire was then administered to all household members who reported to own/operate a business.



2.3 Training and Data Collection

2.3.1 Training

The training for fieldwork personnel took six days. This covered the contents of the questionnaire as well as survey concepts, logistics and other related issues. The survey personnel were also taken through the standard survey methodology and data collection procedures which included how to interview and record different types of responses, applying skip patterns and cancelling wrong answers. Seven trainers facilitated the training.

2.3.2 Data Collection

To aid in identification and access to the household, letters of introduction and identification badges were provided and a village elder recognised by the community assigned to each team. Prior to visiting the clusters, teams also made courtesy calls on the nearest provincial administration offices.

Data collection took 30 days from 30th May to 20th June 2010. Research Assistants visited sampled households to administer the questionnaires. It took the RAs between 40 and 50 minutes to administer the questionnaire depending on the size of the household. Most of the teams managed to collect the data within the stipulated timeframe except teams from Upper Eastern, Nairobi and Nyanza Provinces where data collection was completed a week later owing to various challenges as explained below.

2.3.3 Response rates

Owing to the some logistical challenges, the following clusters were partially or not covered at all:

- One cluster in Tana River due to floods.
- Two clusters in Molo where households shifted to safer areas after the Post Election Violence (PEV). As a result, fewer than the expected households were covered.
- One cluster in Koibatek was covered halfway due to relocation of households to pave way for a large plantation.

As shown in Table 2.1, the overall response rate stood at 85.9 per cent. Nairobi had the lowest response rate at 69.4 per cent while the highest (94.6 per cent) was realized in North Eastern. More than 95.5 per cent of all the sampled households were occupied out of which 85.9 per cent were interviewed.

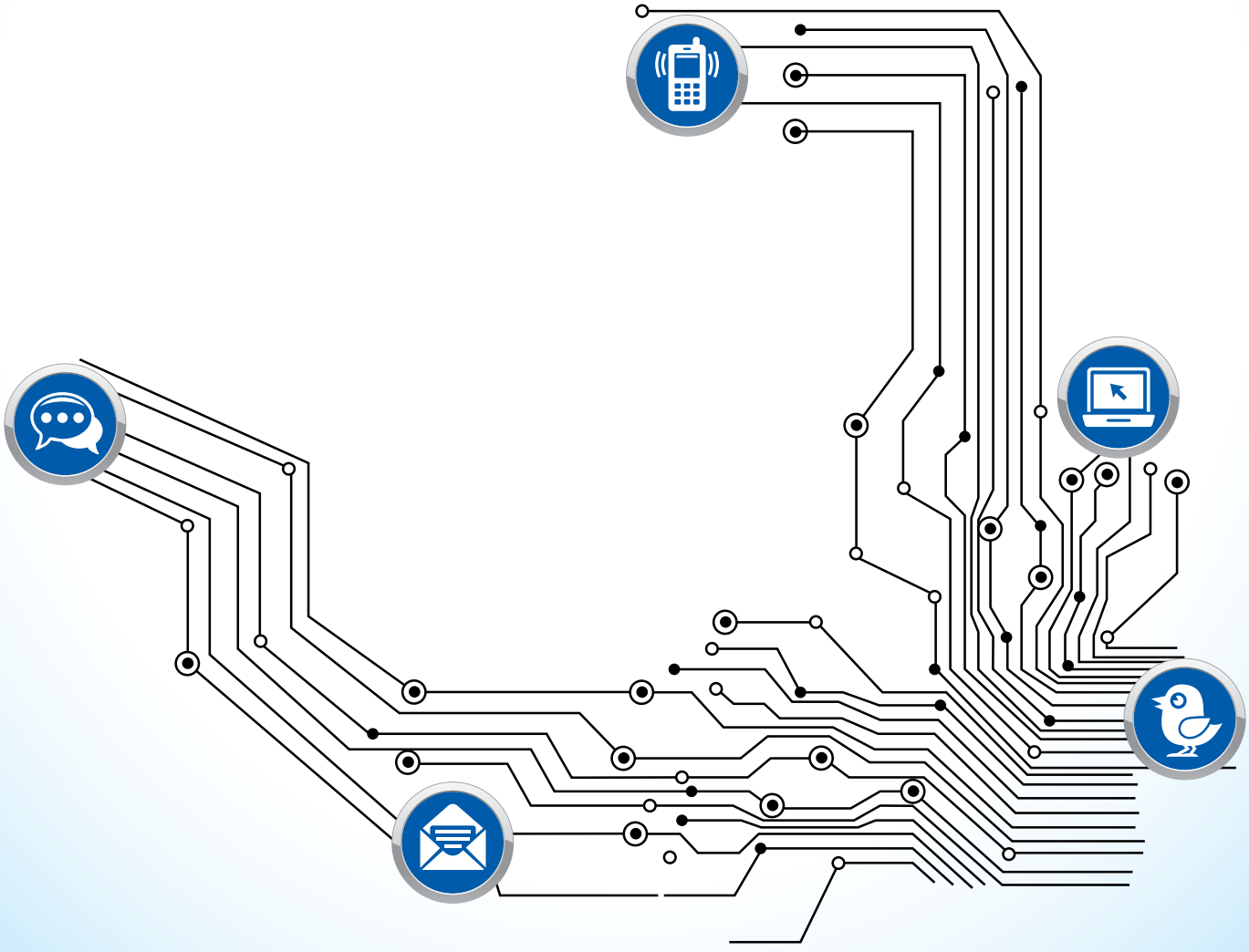
Province	Sampled households	Occupied households	Interviewed households	Household response rate
Nairobi	990	977	678	69
Central	1,140	1,127	976	87
Coast	855	832	725	87
Eastern	1,185	1,115	952	85
North Eastern	450	443	419	95
Nyanza	1,155	1,073	917	86
Rift Valley	1,530	1,396	1,308	94
Western	990	956	828	87
Total	**8,295**	**7,919**	**6,803**	**86**

2.4 Data Processing

As a matter of procedure, initial manual editing was done in the field by the RAs. The supervisors further checked the questionnaires and validated the data in the field by randomly sampling 20 per cent of the filled questionnaires. After the questionnaires were received from the field, an office editing team was constituted to carry out quality check.

Data was captured using Census and Survey Processing System (CSPRO) version 4.0 through a data entry screen specially created with checks to ensure accuracy during data entry. All questionnaires were double entered to ensure data quality. Erroneous entries and potential outliers were then verified and corrected appropriately. A total of 20 data entry personnel were engaged during the exercise.

The captured data were exported to Statistical Package for Social Sciences (SPSS) for cleaning and analysis. The cleaned data was weighted before final analysis. The weighting of the data involved application of inflation factors derived from the selection probabilities of the Enumeration Areas (EAs) and households detailed in section 2.2.7, on weighting the Sample Data.



CHAPTER 3: HOUSEHOLD CHARACTERISTICS

3.0 Household Characteristics

This chapter describes the general characteristics of the sampled population, including composition by age and sex, household size, education, employment, literacy, disability, and source of electricity to households. The survey further sought to establish household headship and the industry in which the household members worked. The ICT survey adopted the definition of Household used in the 2008/09 Kenya Demographic and Health Survey (KDHS). In the KDHS, a household was defined as a person or a group of persons, related or unrelated, who live together and who share a common source of food. The study was designed to consider only usual members of the household.

3.1 Population by Age and Sex

Details on composition of the sampled population are presented in Table 3.1. A striking aspect of the sampled population is that the share of males for the ages 0 – 19 and 50+ years is slightly higher than that of their female counterpart. The situation reverses for the ages 20 to 49 years where the female share is slightly higher than that of male. The population distribution by sex and age corresponds to a typical population pyramid save for a slight distortion resulting from a lower share of age 0-4 compared to 5-9.

3.2 Household Composition

Table 3.1 further shows the percentage distribution of the population by age, sex, province and level of education. Overall, there were as many female as male in the sampled population. About 21 per cent of the sample was from Rift Valley which was the highest, followed by Eastern with about 16 per cent while Nairobi contributed the smallest share of 7 per cent.

3.3 Percentage Distribution by Level of Education Reached

Education contributes to the development of human capacity building and is, therefore, key in the effective use of ICT. The fundamental purpose of education is to gain knowledge, instill appropriate conduct and acquire technical proficiency. It was, therefore, imperative for the survey to collect basic information on education status of the population under study.

In addition to information on education supplied in Table 3.1. percentage distribution of the level of education reached by province and by sex is presented in Table 3.2. Nationally, one in every three persons had attained education beyond secondary school.

Table 3.1: Percentage Distribution of Surveyed Population by Sex, Province, Age and Level of Education

	Sex		
Province	**Male**	**Female**	**Total**
Nairobi	49.4	50.6	3,299,618
Central	49.3	50.7	4,324,897
Coast	48.9	51.1	3,546,840
Eastern	50.5	49.5	4,257,177
North Eastern	53.7	46.3	1,341,656
Nyanza	48.7	51.3	4,951,894
Rift Valley	49.7	50.3	10,971,877
Western	49.1	50.9	4,244,907
Place of Residence			
Rural	50	50	26,257,987
Urban	48.7	51.3	10,680,878
Age			
0 - 4 yrs	51.1	48.9	4,214,323
5 - 9 yrs	48.5	51.5	5,139,627
10 - 14 yrs	54	46	5,058,472
15 - 19 yrs	51.9	48.1	3,922,314
20 - 24 yrs	45.8	54.2	3,481,259
25 - 29 yrs	41	59	2,972,159
30 - 34 yrs	50.5	49.5	2,674,732
35 - 39 yrs	47.9	48.6	1,522,959
40 - 44 yrs	51.4	48.6	1,522,959
45 - 49 yrs	47.2	52.8	1,428,640
50 - 54 yrs	57.2	42.8	1,158,931
55 - 59 yrs	49.7	50.3	799,906
60 - 64 yrs	50.7	49.3	731,303
65 - 69 yrs	47.3	52.7	491,664
70+ yrs	49.7	50.3	1,264,207
Level of Education			
Pre Primary	49.2	50.8	1,438,721
Primary	50	50	18,854,736
Secondary	53	47	6,274,394
Higher	56.4	43.6	1,718,180
None	45.1	54.9	8,408,775
Less than 3 yrs	34.1	65.9	178,166
Non Standard	62.3	37.7	42,817
DK	56.9	43.1	23,075
Total	**49.6**	**50.4**	**36,938,865**

Table 3.2: Percentage Distribution of the Level of Education Reached

	Level of Education								
Province	None	Less than 3 yrs	Pre Primary	Primary	Secondary	Higher	Non Standard	DK	Total
Nairobi	8.6	1.3	6.2	40.8	26.3	16.7	1	0	3,299,618
Central	12.2	3	3.3	53.7	25	5.3	1	1	4,324,897
Coast	25.4	1	4.8	58.6	8.6	2.1	4	1	3,546,840
Eastern	28.2	2	3.6	51.1	14.6	2.1	1	1	4,257,177
North Eastern	56.8	0	4	30.4	7.4	1.1	3	0	1,341,656
Nyanza	19.9	5	3.4	54.2	16.5	5.1	2	1	4,951,894
Rift Valley	23.7	7	4.4	51.9	15.7	3.6	0	1	10,971,877
Western	27.1	2	1.6	50.5	18	2.6	1	0	4,244,907
Place of Residence									
Rural	19.4	2	2.4	37.6	9.7	1.8	1	1	26,257,987
Urban	3.4	3	1.5	13.5	7.3	2.9	0	0	10,680,878
Sex									
Male	20.7	3	3.9	51.5	18.1	5.3	1	1	18,323,456
Female	24.8	6	3.9	50.6	15.8	4	1	1	18,615,409
Age									
0 - 4 yrs	45.4	4.2	14.5	26.1	9.8	0	0	0	4,214,323
5 - 9 yrs	40.4	0	13.2	46.2	3	0	0	0	5,139,627
10 - 14 yrs	10.2	0	0.6	86.4	2.7	0	0	0	5,058,472
15 - 19 yrs	8	0	6	58.4	32.9	0	1	0	3,922,314
20 - 24 yrs	9.6	0	3	49	30.6	10.2	3	0	3,481,259
25 - 29 yrs	9.3	0	4	52	25.4	12.6	2	0	2,972,159
30 - 34 yrs	12.5	0	2	47.2	28.4	11.5	1	0	2,674,732
35 - 39 yrs	10.6	0	4	51.7	27.3	9.8	1	1	2,078,368
40 - 44 yrs	16	0	4	47.6	24.5	11.4	2	1	1,522,959
45 - 49 yrs	15.8	0	6	52.5	23.3	7.7	2	0	1,428,640
50 - 54 yrs	**28.9**	0	5	41.6	22.1	6.7	1	1	1,158,931
55 - 59 yrs	**33.8**	0	3	42.6	17.3	5.1	3	6	799,906
60 - 64 yrs	**46.4**	0	4	39	8.5	5.2	1	4	731,303
65 - 69 yrs	**43.1**	0	6	42.5	10.6	3.2	1	0	491,664
70+ yrs	**63.2**	0	2.5	27	4.7	1.8	2	6	1,264,207
Total	**22.8**	**5**	**3.9**	**51**	**17.0**	**4.7**	**1**	**1**	**36,938,865**

Primary school was reported by 51.0 per cent of the population as the highest level of education reached while 17.0 per cent were reported to have attained secondary level of education. Only 0.1 per cent of the population was reported to have undergone a non-standard system of education. Nairobi had the largest proportion of the highly educated people with 16.7 per cent of its population having attained higher education. This was attributed to concentration of white collar jobs in Nairobi that attracted well-educated persons from other regions of the country. Only 7.4 per cent and 1.1 per cent of North Eastern's population had reached secondary and higher[1] level of education respectively.

3.4 Household Size

Household characteristics are important in analysis as they are a pointer of the social and economic well-being of the members of the household. In many cases, large household size may lead to constrained financial resources and therefore lack of basic necessities. Information on the size of the sampled households is provided in Table 3.3. Almost half of the households interviewed had three to five members while families with six to eight persons constituted 23.9 per cent the total households.

A salient feature of the population was a substantial proportion (8.6 per cent) of households of nine or more members. As would be expected, Nairobi had the highest proportion of small families with 34.6 per cent of its households having only one or two persons while North Eastern had the highest proportion of large families with 41.1 per cent of its households having at least six members.

Table 3.3: Percentage Distribution of Household Headship and Household Composition

	Level of Education							
	Sex of Household Head			Household Head				
Province	Male	Female	NS	1 - 2	3 - 5	6 - 8	9+	Total
Nairobi	76.7	21.5	1.9	34.6	50.5	11.7	3.2	1,002,682
Central	66.9	31.4	1.7	29	54.8	12.7	3.5	1,242,522
Coast	72.1	23.7	4.2	20.8	37.5	27.7	13.9	773,561
Eastern	70.9	27.1	2	18.5	48.2	25.4	7.9	947,927
North Eastern	68.7	27.9	3.4	9.7	30.2	41.1	19	236,775
Nyanza	65.7	34.0	3	24.2	48.3	22.3	5.2	1,190,945
Rift Valley	73.2	20.7	6.1	20.6	37.8	28.5	13.1	2,543,120
Western	69.9	29.7	4	16.5	43.9	32.7	6.9	906,971
Place of Residence								
Rural	70.3	26.1	3.6	18.1	40.9	29.7	11.3	5,750,812
Urban	72	26.2	1.8	32	51.3	13	3.6	3,093,692
Age								
15 - 19 yrs	59.6	40.4	0	68.3	24.1	3	4.6	47,590
20 - 24 yrs	78.8	21.2	0	65.1	33.6	1.3	0	417,652
25 - 29 yrs	71.9	28.1	0	39.2	53.8	6.8	2	853,270
30 - 34 yrs	83.4	16.6	0	13.6	62.4	22.7	1.3	1,275,144
35 - 39 yrs	77	23.0	0	12.1	50.0	32.9	5	1,083,849
40 - 44 yrs	76	24.0	0	12.7	45.6	34	7.6	916,681
45 - 49 yrs	73.8	26.2	0	16.6	36.8	37.9	8.7	856,485

Post-secondary, Colleges, University

Table 3.3: Percentage Distribution of Household Headship and Household Composition (Continued)

	Level of Education							
	Sex of Household Head			Household Head				
	Male	Female	NS	1 - 2	3 - 5	6 - 8	9+	Total
50 - 54 yrs	75.5	24.5	0	18.7	39.8	29.4	12.2	829,426
55 - 59 yrs	69.1	30.9	0	22.9	34.3	29.5	13.3	524,705
60 - 64 yrs	64.7	35.3	0	23.9	46.3	23.8	5.9	525,509
65 - 69 yrs	61.4	38.6	0	30.2	38.8	24.6	6.4	363,925
70+ yrs	58.3	41.7	0	35.5	41	17.2	6.2	886,841
Level of Education								
Pre Primary	**61.2**	38.8	0	18.1	49.9	19.4	12.6	42,385
Primary	**75.6**	24.4	0	22.9	46.6	24.7	5.8	3,889,986
Secondary	**81.6**	18.4	0	22.8	49.5	23.8	3.9	1,978,136
Higher	**83.8**	16.2	0	23.6	54.9	17.7	3.8	791,486
None	54.2	45.8	0	26.5	36.6	28.4	8.5	1,853,483
Non Standard	**75.1**	24.9	0	21.3	51.3	12.2	15.2	12,156
DK	**72.1**	27.9	0	5.9	46.4	47.7	0	13,446
NS	**0**	0	100	0	0	0	100	263,426
Total	**70.9**	**26.1**	**3.0**	**22.9**	**44.6**	**23.9**	**8.6**	**8,844,504**

3.5 Household Headship

Information on household headship and composition is detailed in Table 3.3. On average 26.1 per cent and 70.9 per cent of the households were headed by female and male respectively while an insignificant number of households did not state their headship. There were notable differences across provinces, with Nyanza having the largest proportion of households headed by female at 34.0 per cent while Rift Valley had the smallest proportion of 20.7 per cent.

3.6 Distribution of the Level of Literacy

Table 3.4 shows percentage distribution of literacy for persons aged 15 years and above. Nairobi had the highest level of literacy with 97.4 per cent of its population being literate. Second was Central Province which reported 91.0 per cent while Nyanza was third with a proportion of 86.8 per cent. North Eastern Province had the least proportion of literate population at 39.8 per cent. A comparison between 'urban' and 'rural' reveal a notable disparity in literacy levels. Whereas 94.7 per cent of urban population reported being literate, rural's literacy level was 81.1 percent, 13.6 percentage points lower.

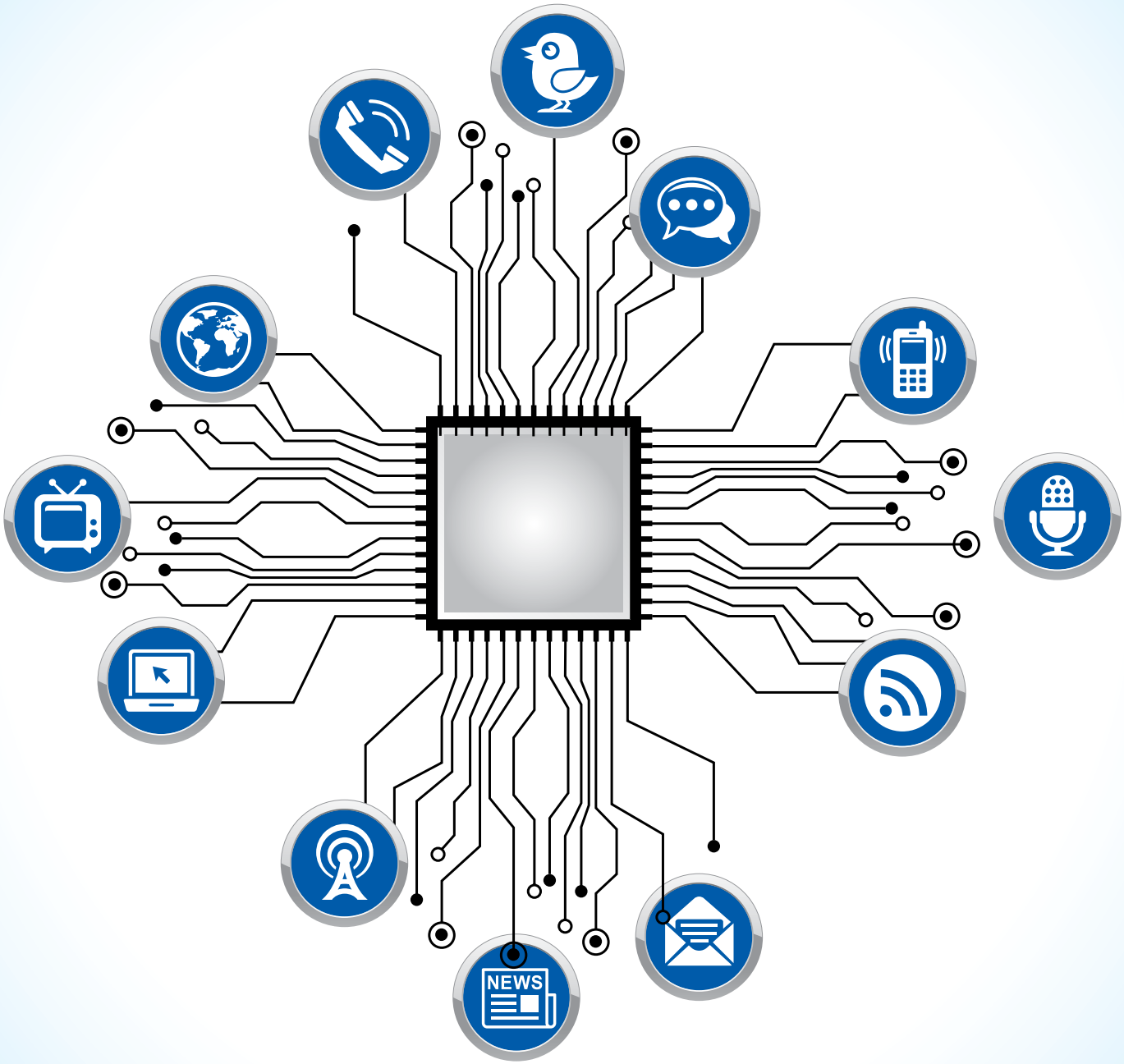

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Table 3.4: Percentage Distribution of the level of Literacy (15+)

	Literacy			
Province	**Yes**	**No**	**DK**	**Total**
Nairobi	97.4	2.4	2	2,216,758
Central	91	8.4	6	2,885,008
Coast	79.8	19.8	4	2,079,732
Eastern	83.1	16.4	5	2,582,866
North Eastern	39.8	57.4	2.8	662,823
Nyanza	86.8	13	2	2,694,410
Rift Valley	85.3	14.2	5	6,186,683
Western	85.2	14.5	3	2,280,834
Place of Residence				
Rural	81.1	18.4	5	14,885,995
Urban	94.7	4.9	4	6,703,119
Sex				
Male	89.7	10	3	10,487,703
Female	81.2	18.2	6	11,101,410
Age				
15 - 19 yrs	95.7	4	3	2,984,985
20 - 24 yrs	93.3	6.1	6	3,481,259
25 - 29 yrs	94.3	5.5	2	2,972,159
30 - 34 yrs	93	6.8	2	2,674,732
35 - 39 yrs	92.3	7.6	2	2,078,368
40 - 44 yrs	87	12.5	5	1,522,959
45 - 49 yrs	86.9	12.8	4	1,428,640
50 - 54 yrs	73.8	25.8	3	1,158,931
55 - 59 yrs	69.5	29.9	6	799,906
60 - 64 yrs	56.1	42.6	1.3	731,303
65 - 69 yrs	56.5	43.1	5	491,664
70+ yrs	34.8	63.2	1.9	1,264,207
Level of Education				
Pre Primary	93.8	0	6.2	116,356
Primary	99.8	0	2	10,343,485
Secondary	99.8	0	2	5,549,437
Higher	100	0	0	1,717,191
None	17.6	80.8	1.6	3,798,906
Non Standard	100	0	0	40,662
DK	100	0	0	23,075
Total	**85.3**	**14.2**	**5**	**21,589,113**

3.7 Employment

Details on employment status by age and education level are presented in Table 3.5. One in every five people was employed while another one in every four people indicated as being self-employed. Fulltime students, retired, and incapacitated constituted 11.8, 2.1 and 1.0 percent respectively. Apparently the survey reveals a high level of unemployment as one person in every four reported to be unemployed.

Majority of persons with pre-primary, primary and non-standard education were either unemployed or self-employed. As expected, persons with higher level of education had the highest proportion of employed at 46.0 per cent. Of those who had reached higher level of education, 14.5 per cent were fulltime students, 14.4 per cent were self-employed while unemployed constituted 20.1 per cent.

Table 3.5: Percentage Distribution of the Employment status (15+)

Province	Employed	Unemployed	Self Employed	Fulltime student	Incapacitated	Retired	Other	Missing	Total
Nairobi	37.5	32	18.1	9.3	0	1.4	1.7	0	2,216,758
Central	23.6	17.4	42.4	10.4	2.9	2.3	9	0	2,885,008
Coast	18	48.3	20.1	8.8	2	2.4	2.1	1	2,079,732
Eastern	19	30.6	34.2	12.5	0.3	2.2	1.1	0	2,582,866
North Eastern	9.2	61.9	14.5	8.5	1.1	1.2	3.7	0	662,823
Nyanza	15.5	21.2	37.0	15.7	2	2.7	5.9	0	2,694,410
Rift Valley	20.1	43.1	16.7	10.9	0.4	1.8	6.9	0	6,186,683
Western	13.8	21.4	42.5	16.8	1.1	2.9	1.6	0	2,280,834
Place of Residence									
Rural	15.6	34.2	29.4	13.1	1.1	2.5	4.2	0	14,885,995
Urban	31.2	30.8	24.5	8.9	7	1.5	2.5	0	6,703,119
Sex									
Male	29	24.5	27.1	13.3	6	2.5	2.9	0	10,487,703
Female	12.4	41.3	28.5	10.4	1.3	1.8	4.3	0	11,101,410
Age									
15 - 19 yrs	4.6	31.7	3.1	58.3	3	0	2	0	2,984,985
20 - 24 yrs	16.3	46.7	14.2	17.9	3	1	4.4	0	3,481,259
25 - 29 yrs	29.2	39.5	25.0	3.2	3	0	2.8	0	2,972,159
30 - 34 yrs	31.7	28.7	31.6	9	3	0	6.8	0	2,674,732
35 - 39 yrs	29.3	28	40.0	1	2	2	2.2	0	2,078,368
40 - 44 yrs	29.3	26.3	39.4	4	1	5	4.1	0	1,522,959
45 - 49 yrs	25.8	23.8	45.4	0	2	8	3.9	1	1,428,640
50 - 54 yrs	26.8	24.1	43.2	2	3	2	3.3	0	1,158,931
55 - 59 yrs	12.9	28.6	45.9	3	1.4	6.6	4.3	0	799,906
60 - 64 yrs	7.9	31.1	42.1	0	1.7	14.7	2.5	0	731,303
65 - 69 yrs	4.3	28.2	45.3	0	2.3	17.5	2.5	0	491,664
70+ yrs	6.2	34.4	28.7	4.4	9.8	13.3	3.1	0	1,264,207

Table 3.5: Percentage Distribution of the Employment status (15+) (Continued)

Province	Employed	Unemployed	Self Employed	Fulltime student	Incapacitated	Retired	Other	Missing	Total
Level of Education									
Pre Primary	6.3	25	38	22.5	1.5	3.1	3.7	0	116,356
Primary	19.4	33.8	30.8	10.7	5	1.6	3.2	0	10,343,485
Secondary	21.6	28	25.6	18.7	2	1.3	4.5	0	5,549,437
Higher	46	20.1	14.4	14.5	3	3.3	1.5	0	1,717,191
None	10.5	44.9	29	3.1	3.6	4.4	4.4	1	3,798,906
Non Standard	32.2	31.2	15.1	20	0	1.5	0	0	40,662
DK	15.6	23.4	38.8	0	0	0	22.2	0	23,075
Total	**20.5**	**33.1**	**27.9**	**11.8**	**1**	**2.1**	**3.6**	**0**	**21,589,113**

3.8 Persons with Disabilities

The World Health Organization (WHO) defines disabilities as "an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations".

Table 3.6 presents details on distribution of persons with disabilities. Nairobi reported 3.9 per cent of its population as having disabilities which was the highest in the country. Nyanza Province was ranked second with 3.6 per cent of its population having different disabilities while Coast was third with 2.3 per cent. Rift Valley reported the least disability prevalence in the country at 1.6 per cent. About two (2) in every five (5) persons with disability linked their conditions to physical impairments while one (1) in every four (4) reported having visual disabilities. Other types of disabilities were reported by 35.1 per cent of those with impairments. The data shows disability prevalence rising with age; with 7.6 per cent of persons of 70 years and above reporting at least one type of disability compared to 2.3 per cent of total population having disabilities. Males reported a proportion of 2.4 per cent of disability which is slightly higher than 2.2 per cent for females.

Table 3. 6: Percentage Distribution of Disability (2+)

	Population with Disability					
Province	Having Disability	Physical	Visual	Hearing	Other	Total
Nairobi	3.9	45.7	28.1	2.1	44.1	3,024,059
Central	2	55.2	28.4	11.1	31.3	4,111,046
Coast	2.3	27.0	22.1	19.3	41.3	3,293,639
Eastern	1.8	26.6	18	23.3	40	4,017,958
North Eastern	2.2	47.6	24.7	14	15.1	1,228,945
Nyanza	3.6	39.1	25.8	19.6	24.8	4,629,954
Rift Valley	1.6	39.6	22.8	7.2	44.4	10,217,921
Western	2.2	39.5	20.6	28	25.2	4,045,792
Place of Residence						
Rural	2.2	42.4	26.4	18.2	26.7	24,730,955
Urban	2.5	34.2	19	6.7	53.6	9,838,358
Sex						
Male	2.4	36.2	24.6	14.8	36.6	17,082,230
Female	2.2	43.9	23.5	14.4	33.4	17,487,083
Age						
0 - 4 yrs	1	27.3	37.4	0	42.1	1,844,771
5 - 9 yrs	1.3	32.7	20.2	25.4	28.1	5,139,627
10 - 14 yrs	1.7	26.4	19.3	21.6	44.2	5,058,472
15 - 19 yrs	1.8	20.8	17.7	26.3	44.3	3,922,314
20 - 24 yrs	2.3	46.7	25.9	8.6	44.7	3,481,259
25 - 29 yrs	2.6	48.1	26.6	11.2	43.7	2,972,159
30 - 34 yrs	2.7	35.7	7.5	13.7	50.2	2,674,732
35 - 39 yrs	2.6	30.7	7.8	3	60.7	2,078,368
40 - 44 yrs	2.1	44.2	41.2	4.9	22.6	1,522,959
45 - 49 yrs	2	40.7	22.3	19.4	30.4	1,428,640
50 - 54 yrs	2.1	60.7	30.9	5.8	6.2	1,158,931
55 - 59 yrs	3.4	74.5	24.6	6	17.8	799,906
60 - 64 yrs	5.0	47	37	10	17.2	731,303
65 - 69 yrs	4.6	46.8	36.8	19.6	18.8	491,664
70+ yrs	7.6	48.3	36.6	17.3	10.9	1,264,207

Table 3. 6: Percentage Distribution of Disability (2+) (Continued)

		Population with Disability				
	Having Disability	Physical	Visual	Hearing	Other	Total
Level of Education						
Pre Primary	1.4	49.3	26.3	0	30.9	1,307,291
Primary	2	39.7	25.4	16.7	32.7	17,819,366
Secondary	1.7	31.4	21.5	9.5	54	5,863,398
Higher	1.9	47.4	15.3	0.0	37.4	1,718,180
None	3.8	41.6	24.3	16.4	31.4	7,795,186
Non Standard	0	-	-	-	-	42,817
DK	0	-	-	-	-	23,075
Total	**2.3**	**39.9**	**24.1**	**14.6**	**35.1**	**34,569,313**

3.9 Source of electricity

For the development and maintenance of ICT networks, it is important to have other infrastructure like electricity, water, road, rail, and air transport systems in place. In particular electricity is viewed as a key driver of the ICTs and therefore the survey sought to establish the extent to which it affects penetration of ICT in the country.

Information on distribution of the source of electricity by Province, Sex, Age and Level of education is presented in Table 3.7. Connection through the grid was the main source of electricity with 25.7 per cent of households connected to it while 15.3 per cent of the homes were connected to other types of electricity sources. A slightly higher proportion of male headed households were connected to electricity compared to their female counterparts. A look at the table suggests that connection to electricity is highest at age group 30-34 years. Slightly less than half of the households surveyed reported not being connected to any type of electricity supply.

Table 3.7: Percentage Distribution of Source of Electricity by Province, Sex, Age and Level of Education

	Main source of electricity for the household						
	Grid	Generator	Solar	Wind	Other	None	Total
Level of Education							
Nairobi	92.8	1.3	0	0	3.9	2	1,002,682
Central	36.9	7	4.8	0	34.9	22.7	1,242,522
Coast	26.7	6	1.4	0	0.1	71.2	773,561
Eastern	17.7	5	7.4	0	14.7	59.7	947,927
North Eastern	16.8	9	2.1	0	0	80.3	236,775
Nyanza	15.2	2.2	3.7	1	15.3	63.5	1,190,945
Rift Valley	29.1	1	4.9	1	17.4	47.4	2,543,120
Western	11.2	6	1.7	2	3.0	83.4	906,971
Place of Residence							
Rural	12.6	1	5.2	1	16.9	64.2	5,750,812
Urban	57.7	9	1.4	0	11.4	28.6	3,093,692
	25.7	1	4.1	1	15.3	53.8	6,268,960
Sex							
Male	25.2	1.2	4.6	1	14.3	54.6	2,312,118
Female	24.3	5	3	1	16.7	55.3	263,426
NS	48.1	0	2.7	0	25.3	23.8	47,590
Age							
15 - 19 yrs	27.6	0	2.7	0	15.2	54.5	417,652
20 - 24 yrs	39.2	4	3.5	0	19.1	37.8	853,270
25 - 29 yrs	37.6	6	1.3	0	16.6	43.9	1,275,144
30 - 34 yrs	41.7	1	3.6	0	11.7	41.9	1,083,849
35 - 39 yrs	20	9	4.2	0	15.2	59.8	916,681
40 - 44 yrs	23.2	1	5.3	2	11.7	58.6	856,485
45 - 49 yrs	31.3	1.2	2.3	2	14.6	50.5	829,426
50 - 54 yrs	21	1.3	6.8	0	17.3	53.6	524,705
55 - 59 yrs	17.1	9	4.5	0	14.2	63.3	525,509
60 - 64 yrs	15	9	4.1	3	17.1	62.6	363,925
65 - 69 yrs	12.4	3.2	4.8	0	13.1	66.4	886,841
70+ yrs	9.1	7	4.9	0	17.6	67.7	42,385
Level of Education							
Pre Primary	8.8	6	3	0	3.3	84.3	3,889,986
Primary	15.9	9	3.6	1	17.4	62.0	1,978,136
Secondary	35.1	1.2	5.3	1	13.5	44.9	791,486

Table 3.7: Percentage Distribution of Source of Electricity by Province, Sex, Age and Level of Education (Continued)

	Main source of electricity for the Household						
	Grid	Generator	Solar	Wind	Other	None	Total
Higher	62.2	1.7	5.7	0	6.4	24	1,853,483
DK	13.3	0	6.7	0	32.8	47.1	12,156
NS	28.1	1	1.6	0	17.7	52.4	13,446
							263,426
Total	**25.7**	**1**	**4.1**	**1**	**15.3**	**53.8**	**8,844,504**

Main source of Electricity for the Household

Province	Grid	Generator	Solar	Wind	Other	None	Total
Nairobi	92.8	1.3	0	0	3.9	2	1,002,682
Central	36.9	7	4.8	0	34.9	22.7	1,242,522
Coast	26.7	6	1.4	0	1	71.2	773,561
Eastern	17.7	5	7.4	0	14.7	59.7	947,927
North Eastern	16.8	9	2.1	0	0	80.3	236,775
Nyanza	15.2	2.2	3.7	1	15.3	63.5	1,190,945
Rift Valley	29.1	1.0	4.9	1	17.4	47.4	2,543,120
Western	11.2	6	1.7	2	3	83.4	906,971
Place of Residence							
Rural	12.6	1	5.2	1	16.9	64.2	5,750,812
Urban	57.7	9	1.4	0	11.4	28.6	3,093,692
Sex							
Male	25.2	1.2	4.6	1	14.3	54.6	2,312,118
Female	24.3	5	3	1	16.7	55.3	263,426
NS	48.1	0	2.7	0	25.3	23.8	47,590
Age							
15 - 19 yrs	27.6	0	2.7	0	15.2	54.5	417,652
20 - 24 yrs	39.2	4	3.5	0	19.1	37.8	853,270
25 - 29 yrs	37.6	6	1.3	0	16.6	43.9	1,275,144
30 - 34 yrs	41.7	0	3.6	0	11.7	41.9	1,083,849
35 - 39 yrs	20	9	4.2	0	15.2	59.8	916,681
40 - 44 yrs	23.2	1.0	5.3	2	11.7	58.6	856,485
45 - 49 yrs	31.3	1.2	2.3	2	14.6	50.5	829,426
50 - 54 yrs	21	1.3	6.8	0	17.3	53.6	524,705
55 - 59 yrs	17.1	9	4.5	0	14.2	63.3	525,509
60 - 64 yrs	15	9	4.1	3	17.1	62.6	363,925

Main source of electricity for the Household

	Grid	Generator	Solar	Wind	Other	None	Total
65 - 69 yrs	12.4	3.2	4.8	0	13.1	66.4	886,841
70+ yrs	9.1	7	4.9	0	17.6	67.7	42,385
Level of Education							
Pre Primary	8.4	0	8.5	0	6.4	76.7	42,385
Primary	19.6	1.0	4.3	1	17.4	57.7	3,889,986
Secondary	40.3	1.1	5.6	1	12.7	40.2	1,978,136
Higher	63	2.3	5.1	0	6.1	23.5	791,486
None	9	6	1.9	0	15.2	73.3	1,853,483
Non standard	56	0	28.5	0	0	15.5	12,156
DK	10.7	0	0	0	65.6	23.7	13,446
NS	47.8	0	2.7	0	25.3	24.2	263,426
Total	**25.7**	**1**	**4.1**	**1**	**15.3**	**53.8**	**8,844,504**

Nairobi Province had the highest connections to the grid with 92.8 per cent of homes connected while Western had the least connections with only 11.2 households connected. Only 12.6 per cent of rural households reported being connected to the grid while 57.7 per cent of urban households had their premises connected to the electrical grid. A wide disparity was observed between urban and rural households not connected to any form of electricity. Whereas two (2) in every three (3) urban homes were connected to one form of electricity source, only one (1) in every three (3) rural homes was connected.

CHAPTER 4: ACCESS, USAGE AND OWNERSHIP OF ICT FACILITIES BY HOUSEHOLDS AND INDIVIDUALS

4.0 Introduction

This chapter discusses the survey findings on access, usage and ownership of radios, televisions, computers, mobile phones, fixed line telephones, and internet facilities. Globally, the Information and Communication Technologies (ICT) sector has been identified as pivotal in raising labour productivity and enhancing a country's competitiveness.

Computers and other ICT gadgets have become part of the households today and are no longer perceived as luxuries. Households without ICT facilities have resorted to seeking the ICT service from such places like nearby cyber cafés and friends' houses. In general, household ownership of personal computers and mobile phones and internet access are closely linked and dependent on household incomes. Convergence of technologies in the ICT sector has also made it easier to access ICT services like the internet.

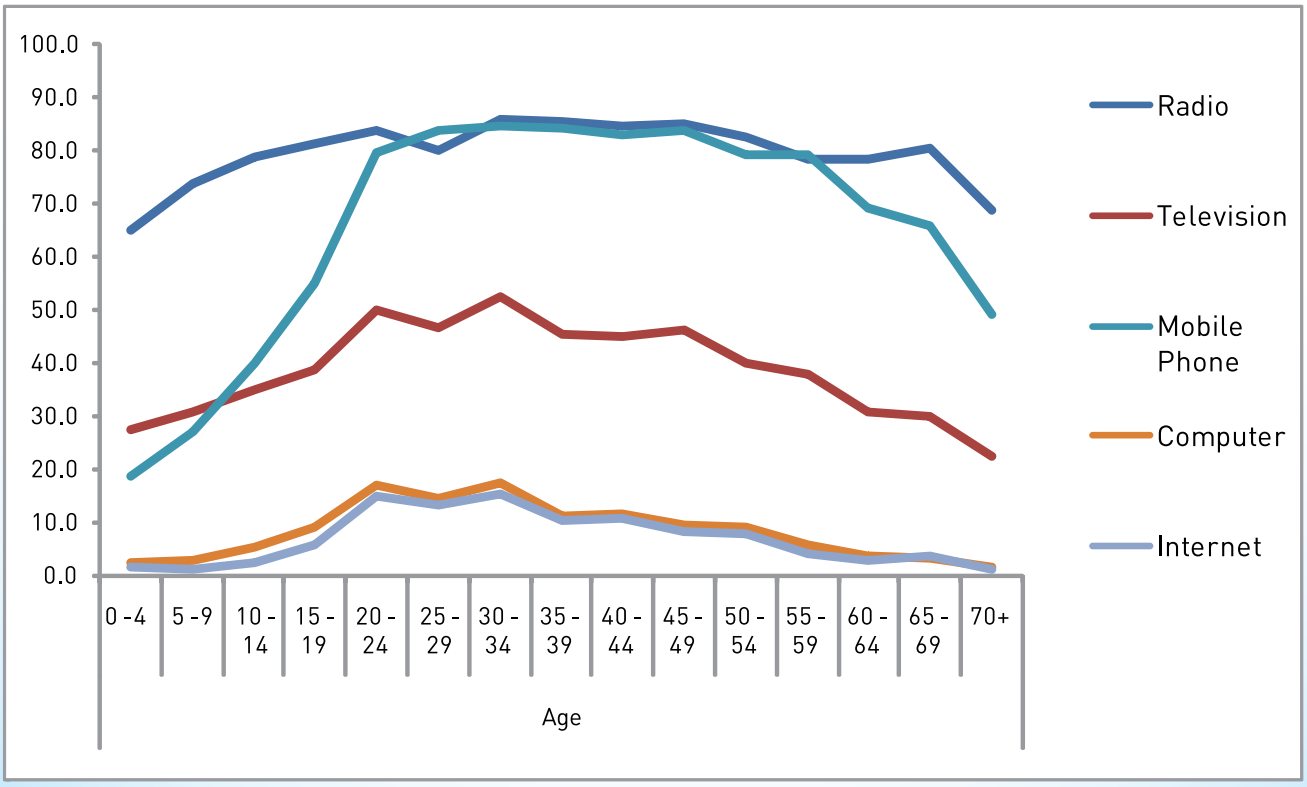
Access, usage and ownership of ICT are key in linking communities, facilitating businesses and empowering communities socially and economically. It is, therefore, imperative that every effort is made to bridge the digital divide between those who have information and those who need the information. Enhancement of access to information and communications services in rural, remote and underserved areas is key to accelerating development.

The results of the survey show that in most cases there is a correlation between access and usage on one hand and sex, education, and age on the other. Among the notable findings is that use of ICT was more widespread among the younger people aged between 20 and 34.

4.1 Access

Broadly, access to ICT can be looked at as possession or availability (e.g. through home, office, school or public location) of ICT equipment; the ability to pay for ICT products and services and the skills to use ICT effectively. The survey results point to a wide gap between the access of the newer technologies such as the Internet and that for traditional technologies such as telephony and radio.

Figure 4.1: Proportion of Population with Access to Some Selected ICT Equipments (3+)



In general, access to ICT facilities seems to increase with age and peaks at the ages between 20 to 39 years then declines as age advances (Figure 4.1). Table 4.1 presents the distribution of the population with access to ICT facilities. The survey results indicate that radio had the widest reach at 79.5 per cent of the population reported having access to a radio terminal. Penetration of mobile telephone was second with 59.8 per cent of the population connected. Television was placed third with two people out of every five with access to TV.

Penetration of other facilities was apparently marginal with computers, internet, pay TV, and fixed line only having proportions of 9.1, 7.2, 4.3 and 3.1 percent respectively. Age groups 30 – 34 led in access to all the ICT equipment except for the pay TV where those aged 20 – 24 took the lead. There was a notable inequality in access to ICT facilities between the rural and urban population. For instance, 66.1 and 21.1 per cent of urban population reported access to TV and computers compared to 29.2 and 4.3 per cent of their rural counterparts.

Table 4.1: Percentage Distribution of Population with Access to ICT Equipment (3+)

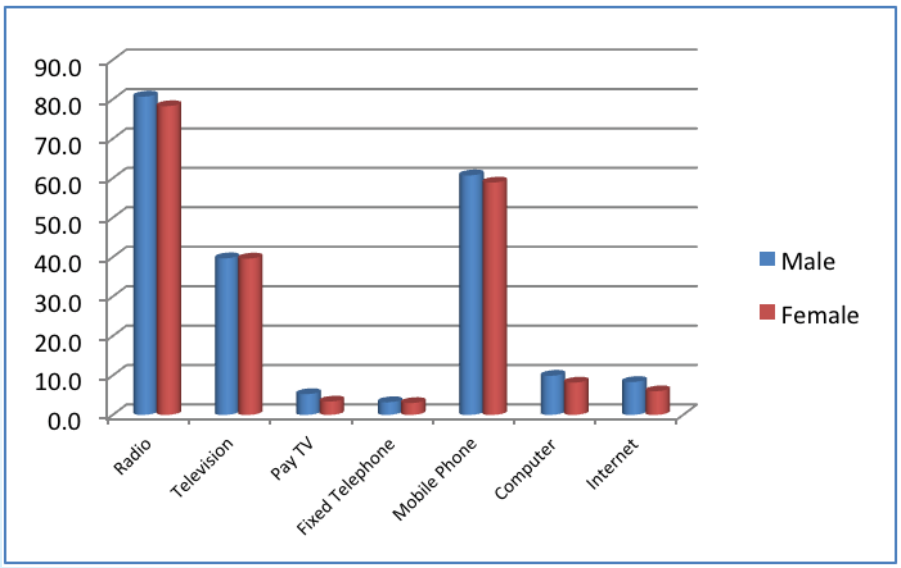
Province	Radio	Television	Pay TV	Fixed Telephone	Mobile Phone	Computer	Internet	Total
Nairobi	80.4	78.2	13.2	11.9	76.2	32.7	28.3	3,024,059
Central	89.6	46.5	2.3	1.4	74.0	9.3	7.1	4,111,046
Coast	70.6	36.9	8.1	6.3	50.7	10.3	8.4	3,293,639
Eastern	83.1	34.4	2.9	2.0	64.2	6.6	4.9	4,017,958
North Eastern	67.5	13.6	1.7	1.2	41.1	3.8	3.6	1,228,945
Nyanza	75.7	29.4	4.2	1.8	57.3	7.8	5.8	4,629,954
Rift Valley	79.2	41.1	3.6	2.3	58.0	6.1	4.7	10,217,921
Western	80.9	27.8	9	1.2	49.5	3.0	1.5	4,045,792
Place of Residence								
Rural	78.1	29.2	2.7	1.9	55.0	4.3	3.4	24,730,955
Urban	83.1	66.1	8.4	6.4	71.9	21.1	16.6	9,838,358
Sex								
Male	80.7	39.7	5.3	3.3	60.8	10.0	8.4	17,082,230
Female	78.3	39.7	3.4	3.0	58.9	8.2	6.0	17,487,083
Age								
0 - 4 yrs	64.9	27.5	1.5	1.1	18.7	2.5	1.8	1,844,771
5 - 9 yrs	73.9	31.0	1.6	1.5	27.2	3.0	1.4	5,139,627
10 - 14 yrs	78.8	35.3	2.7	2.1	40.0	5.6	2.5	5,058,472
15 - 19 yrs	81.2	39.1	5.5	1.9	55.3	9.3	5.8	3,922,314
20 - 24 yrs	83.9	50.5	8.1	4.3	79.7	17.2	15.1	3,481,259
25 - 29 yrs	79.9	46.9	6.4	3.8	83.8	14.8	13.4	2,972,159
30 - 34 yrs	86.0	52.8	7.8	6.0	84.7	17.7	15.3	2,674,732
35 - 39 yrs	85.6	45.7	4.8	5.2	84.2	11.2	10.3	2,078,368
40 - 44 yrs	84.8	45.4	5.2	5.1	83.1	11.7	10.8	1,522,959
45 - 49 yrs	85.2	46.8	4.0	3.2	83.8	9.8	8.5	1,428,640

Table 4.1: Percentage Distribution of People with Access to ICT Equipment (3+) (Continued)

	Radio	Television	Pay TV	Fixed Telephone	Mobile Phone	Computer	Internet	Total
50 - 54 yrs	82.5	40.4	3.3	5.2	79.3	9.1	7.9	1,158,931
55 - 59 yrs	78.7	38.2	3.2	4.1	79.4	6.1	4.2	799,906
60 - 64 yrs	78.6	30.9	2.3	2.8	69.1	3.8	2.9	731,303
65 - 69 yrs	80.2	30.2	3.1	3.6	66.2	3.6	3.8	491,664
70+ yrs	68.9	22.6	2.1	1.9	48.9	1.7	1.5	1,264,207
Level of Education								
Pre Primary	75.1	44.7	3.1	1.3	29.2	4.9	2.8	1,307,291
Primary	82.0	36.9	3.3	2.2	60.2	4.5	2.9	17,819,366
Secondary	87.6	56.3	8.1	4.7	83.7	18.1	13.3	5,863,398
Higher	89.6	82.5	16.4	16.1	97.0	60.3	57.7	1,718,180
None	66.0	23.2	1.2	1.4	37.9	1.9	1.7	7,795,186
Non Standard	95.9	73.0	25.9	19.0	83.4	46.7	31.2	42,817
DK	90.1	16.2	7.7	1.3	78.7	7.7	7.7	23,075
Total	**79.5**	**39.7**	**4.3**	**3.1**	**59.8**	**9.1**	**7.2**	**34,569,313**

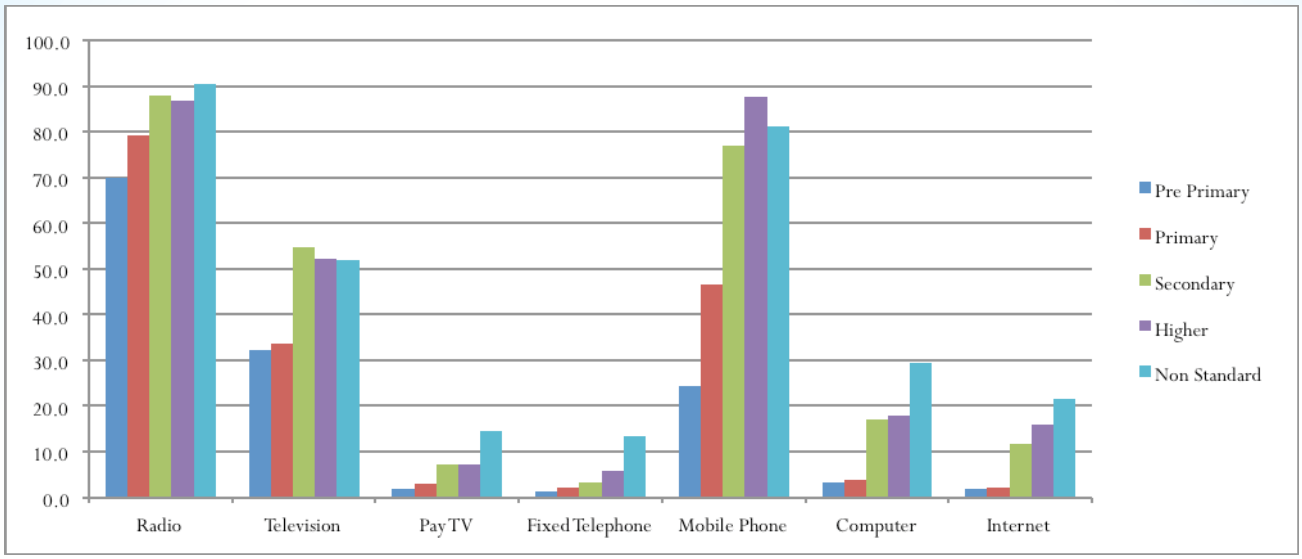
Figure 4.2 depicts a comparison of access to ICT equipment between female and male. The figure reveals that males had a higher proportion of its population having access to ICT compared to females. For example, while 80.7 per cent and 60.8 per cent of male population had access to radio and mobile telephones respectively, 78.3 per cent and 58.9 per cent of their female counterparts had access to radio and mobile telephones representing a differential of 2.4 and 1.8 percentage points, respectively.

Figure 4.2: Access of ICT Equipment by Sex



A look at accessibility of ICT equipment by education level reached reveals that the proportion of persons with higher education and having access to ICT were substantially higher than the other categories for all ICT Equipment (Figure 4.3). For instance, while 60.3 and 57.7 per cent of persons with higher education had access to computers and internet, 4.9 and 2.8 per cent of persons with pre-primary and primary education had access to computers, respectively.

Figure 4.3: Access to ICT Equipment by Education Level (Age 3+)



4.2 Distance Travelled to Access ICT Facilities

Information on the average distances covered to access telephone, internet, TV and postal services is presented on Table 4.2. The table shows the distances travelled by people from different provinces to access ICT facilities. Surprisingly, Nairobi residents do not travel less distances to access ICT facilities than other counterparts in other provinces. The average distance for telephone and internet access in Nairobi were higher than the national average while distances for TV and postal service are just around the national average. Distances covered to access the ICT facilities also depend on whether one is in urban and rural setup, with those in the latter travelling longer distances.

Table 4.2: Average distance travelled to Access Telephone, Internet, Television and Postal Services by Province, Sex, Age and Level of Education (3+) Table 4.2: Average distance travelled to Access Telephone, Internet, Television and Postal Services by Province, Sex, Age and Level of Education (3+)

Province	Distance Travelled to access telephone (Km)	Distance Travelled to access Internet (Km)	Travelled to access Television (Km)	Distance Travelled to access Postal Services (Km)	Total
Nairobi	3.4	2.8	2.2	1.3	153,618
Central	2.6	2.0	2.2	2.1	118,092
Coast	3.7	2.9	1.2	2.1	327,772
Eastern	4.5	2.5	2.3	0.6	321,386
North Eastern	2.3	-	2.4	7.0	18,473

Table 4.2: Average distance travelled to Access Telephone, Internet, Television and Postal Services by Province, Sex, Age and Level of Education (3+) Table 4.2: Average distance travelled to Access Telephone, Internet, Television and Postal Services by Province, Sex, Age and Level of Education (3+) (Continued)

	Distance Travelled to access telephone(Km)	Distance Travelled to access Internet(Km)	Distance Travelled to access Television(Km)	Distance Travelled to access Postal Services(Km)	Total
Nyanza	2.2	2.9	2.6	1.0	271,062
Rift Valley	2.5	1.6	2.2	1.7	806,699
Western	1.2	1.8	1.6	0.5	208,469
Place of Residence					
Rural	2.4	2.5	2.1	1.7	1,455,573
Urban	2.7	2.5	2.0	1.1	769,998
Sex					
Male	2.7	2.5	2.2	1.2	1,313,679
Female	2.2	2.4	1.8	1.8	910,266
NS	-	-	1.0	-	1,625
Age					
0 - 4 yrs	-	1.5	1.7	-	50,073
5 - 9 yrs	1.0	3.0	1.8	1.1	223,281
10 - 14 yrs	2.6	3.0	2.1	2.2	286,057
15 - 19 yrs	2.1	3.4	2.6	2.7	264,946
20 - 24 yrs	2.0	1.9	1.7	0.2	345,249
25 - 29 yrs	2.3	2.5	2.4	1.1	191,634
30 - 34 yrs	2.8	2.0	1.4	1.6	266,805
35 - 39 yrs	3.2	2.6	2.1	1.2	188,556
40 - 44 yrs	2.8	1.7	2.1	2.4	108,410
45 - 49 yrs	2.5	3.0	2.4	1.5	91,631
50 - 54 yrs	4.0	4.2	2.9	1.6	86,400
55 - 59 yrs	1.7	3.0	1.6	1.4	33,731
60 - 64 yrs	3.1	3.6	2.8	1.5	25,570
65 - 69 yrs	1.5	.	1.4	0.3	19,100
70+ yrs	1.1	5.0	2.2	2.7	44,125
Total	**2.5**	**2.5**	**2.0**	**1.4**	**2,225,571**

Eastern Province reported the longest distances of 4.5 kilometres on average for telephone services while people from North Eastern have to cover 7 kilometres to access postal services. Western Province reported the shortest distances of 1.2 kilometres and 0.5 kilometres for telephone and postal services, respectively. For internet access, people from the Rift Valley reported the shortest average distance of 1.6 kilometres while their counterparts in Coast and Nyanza reported equal distance travelled of 2.9 kilometres. Except for distance covered to access internet, where rural and urban folks travel equal distances (2.5 kilometres), and urban reported closer ICT services compared to rural in all other cases. Nationally, Kenyans travel longer distances to access telephone (2.5 kilometres) and internet (2.5 kilometres) compared to accessing TV and postal services where on average they travel 2.0 kilometres and 1.4 kilometres, respectively.

4.3 Use of Computers

Details on distribution of usage of computers during the 12 months period prior to the survey are given in Table 4.3. The table shows that only 8.4 per cent of the population used computers during the reference period. The use of computers increased with age peaking at 20-24 years before experiencing a gradual decline. Slightly less than a third of the persons who had used computers during the reference period reported to have accessed them at the cyber cafes while somewhat less than a quarter had accessed them at their homes.

Those who reported to have used computers at offices/ work place and educational centres accounted for 20.6 and 15.0 per cent, respectively. The number of persons who reported to have used computers from a community centre and friend's house accounted for 2.1 and 1.7 percent respectively. For urban population, one in every five persons reported having used a computer within 12 months preceding the survey while for rural, only one in every twenty five persons reported to have used a computer within the same period.

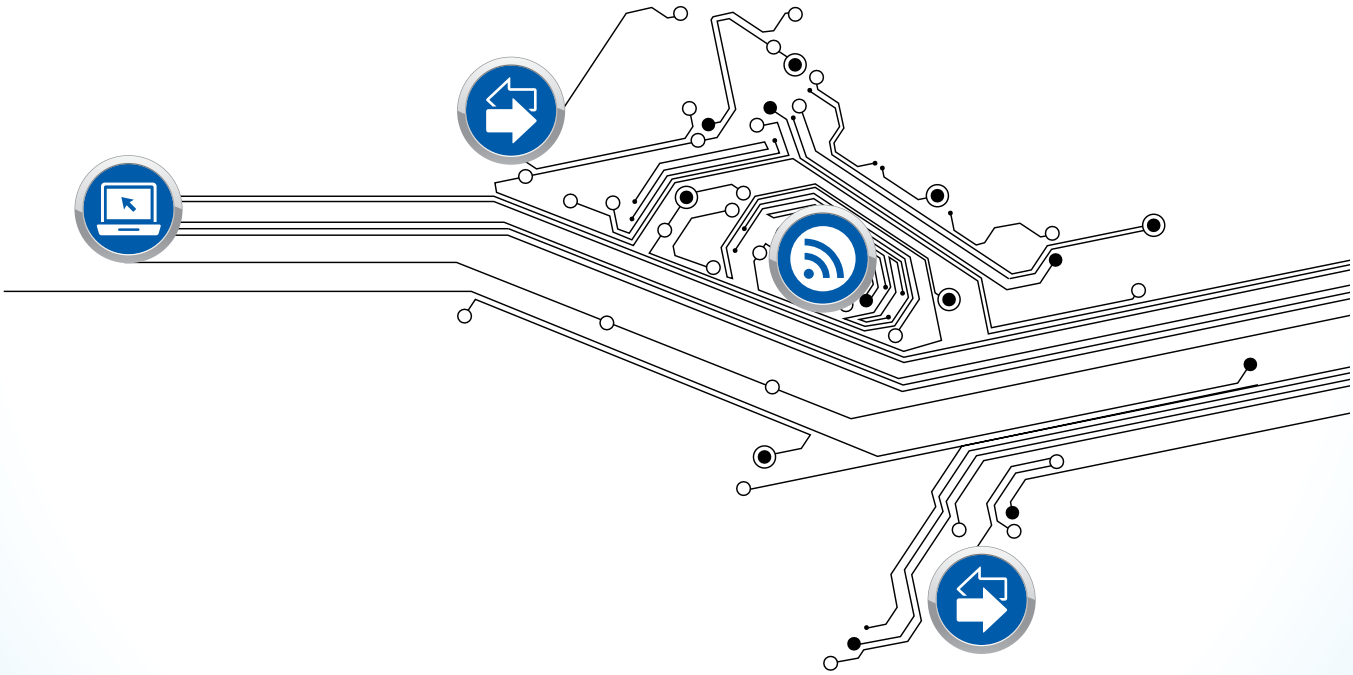


Table 4.3: Percentage Distribution of People Who had used a computer in the last 12 months by place of Access (3+)

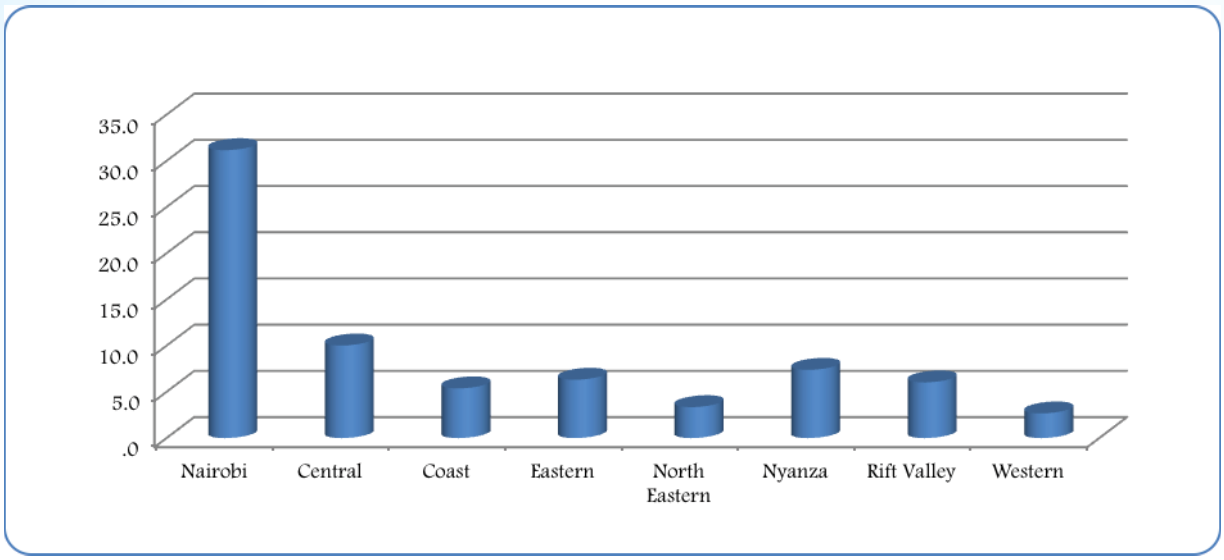
			Place of Computer use in last 12 Months								
Province	Use of Computers	Total	Own house	Friends house	Office/ work place	Cybercafe	Community centre	Educational centre	Mobile phone	Other	Total
Nairobi	31.2	3,024,059	35.7	3.1	27.5	29.9	1.6	15.6	9.5	1.2	942,241
Central	10.0	4,111,046	20.8	1.1	20.2	23.9	1.1	17.1	4.3	4	412,525
Coast	5.4	3,293,639	9.4	1.9	9.3	19.3	1	7.8	2.4	2	177,632
Eastern	6.3	4,017,958	6.4	1.1	10.4	19.6	0	11.9	3	2.2	254,141
North Eastern	3.4	1,228,945	0	0	6.1	37.2	0	14.5	9.2	0	41,215
Nyanza	7.4	4,629,954	25.1	3	20.0	37.3	3.3	17.0	9.8	0	342,236
Rift Valley	6.0	10,217,921	19.4	1.3	20.0	32.1	2.3	15.8	2.5		615,871
Western	2.7	4,045,792	7.1	1.0	16.1	17.5	14.6	9.9	0	0	108,052
Place of Residence											
Rural	3.7	24,730,955	16.1	1.1	15.4	25.0	9	15.6	3.8	2	917,465
Urban	20.1	9,838,358	26.3	2.0	23.1	30.1	2.7	14.7	6.6	1.0	1,976,448
Sex											
Male	9.5	17,082,230	24.4	2.2	24.0	28.7	2.3	13.3	6.5	7	1,622,442
Female	7.3	17,487,083	21.4	1.2	16.4	28.2	1.8	17.1	4.7	7	1,271,471
Age											
0 - 4 yrs	7	1,844,771	4.8	0	0	0	14.5	12.8	0	0	13,651
5 - 9 yrs	1.8	5,139,627	32.2	0	0	1.8	2.2	23.3	.5	0	90,277
10 - 14 yrs	4.3	5,058,472	30.1	1.1	0	3.9	3.8	21.6	1.2	0	216,390
15 - 19 yrs	9.4	3,922,314	14.6	1.3	1.8	16.2	1.9	36.7	2.7	1.0	368,554
20 - 24 yrs	18.2	3,481,259	14.3	2.1	6.8	30.7	2.8	23.9	6.3	1.8	634,537
25 - 29 yrs	13.7	2,972,159	23.4	3.1	24.3	45.0	2.1	11.7	5.0	6	407,677
30 - 34 yrs	16.5	2,674,732	24.7	2.0	41.5	41.1	5	2.3	7.9	7	441,502
35 - 39 yrs	11.5	2,078,368	33.0	2.9	36.2	32.8	2.3	2.0	7.4	0	238,407
40 - 44 yrs	11.4	1,522,959	22.1	6	40.9	33.8	2.9	4.3	9.6	0	173,275
45 - 49 yrs	8.7	1,428,640	35.7	1	34.5	23.3	2.1	3.9	7.7	0	124,353

Table 4.3: Percentage Distribution of People Who use computer in the last 12 months by place of Access (3+) (Continued)

			Place of Computer use in last 12 Months								
	Use of Computers	Total	Own house	Friends house	Office/ work place	Cybercafe	Community centre	Educational centre	Mobile phone	Other	Total
Age											
50 - 54 yrs	8.8	1,158,931	31.3	0	50.1	16.9	5	1.1	7.6	1.1	102,364
55 - 59 yrs	4.7	799,906	39.4	0	26.4	13.5	0	2.2	4.9	0	37,819
60 - 64 yrs	3.0	731,303	47.7	0	8.3	21.6	0	0	12.2	0	21,968
65 - 69 yrs	2.3	491,664	27.8	0	13.0	12.3	0	0	1.3	0	11,065
70+ yrs	1.0	1,264,207	13.3	0	4.1	9	0	5.4	5.4	0	12,074
Level of Education											
Pre Primary	2.7	1,307,291	14.9	6.0	6.0	6.0	6.0	22.0	7.3	0	35,324
Primary	3.8	17,819,366	19.6	1.7	6.5	10.3	1.5	14.0	1.8	0	674,725
Secondary	17.1	5,863,398	16.5	1.7	16.8	31.3	1.9	17.7	4.2	1.6	1,005,225
Higher	63.0	1,718,180	32.4	1.8	34.3	38.0	2.3	13.0	9.4	5	1,081,657
None	1.1	7,795,186	7.2	0	8.4	28.7	5.4	12.7	3.5	0	84,625
Non Standard	28.2	42,817	61.5	0	30.7	10.7	0	30.7	30.7	0	12,054
DK	1.3	23,075	.0	0	0	0	0	0	0	0	302
Total	**8.4**	**34,569,313**	**23.1**	**1.7**	**20.6**	**28.5**	**2.1**	**15.0**	**5.7**	**7**	**2,893,913**

Regionally as expected, Nairobi had the highest usage of computers with 31.2 per cent of the population reporting to have used computers in the 12 months preceding the survey. It was followed by Central and Nyanza with 10.0 percent and 7.4 percent respectively as shown in Figure 4.4. Western Province reported the lowest usage with a proportion of 2.7 per cent. The proportion of men who had used computers was 9.5 per cent slightly higher than 7.3 per cent for women.

Figure 4.4: Use of computer in the last 12 months



4.4 Use of Internet

Table 4.4 presents details on frequency in the use of Internet over the six months preceding the survey. Nationally, 6.3 per cent of the population reported to have engaged in internet activities during this period. Nairobi had the highest proportion of Internet users at 25.9 per cent followed by Central and Nyanza with 6.7 and 5.5 per cent, respectively. Western and Coast provinces had the lowest level of use of the Internet with 1.4 and 3.5 per cent of their populations respectively reporting use of the Internet.

Only 3.2 per cent of the population reported daily use while 1.8 per cent reported having used internet at least once every week. A higher proportion of males (7.5 per cent) compared to females (5.2 percent) used the Internet. The data shows that frequency of use rose with level of education with proportions of population rising from 0.8 per cent for pre-primary, 2.0 for those with primary education, 12.4 per cent of those with secondary education and 59.5 per cent for those with higher education.

Table 4.4: Percentage Distribution of People with Internet activities in the last 6 months by frequency of use (3+)

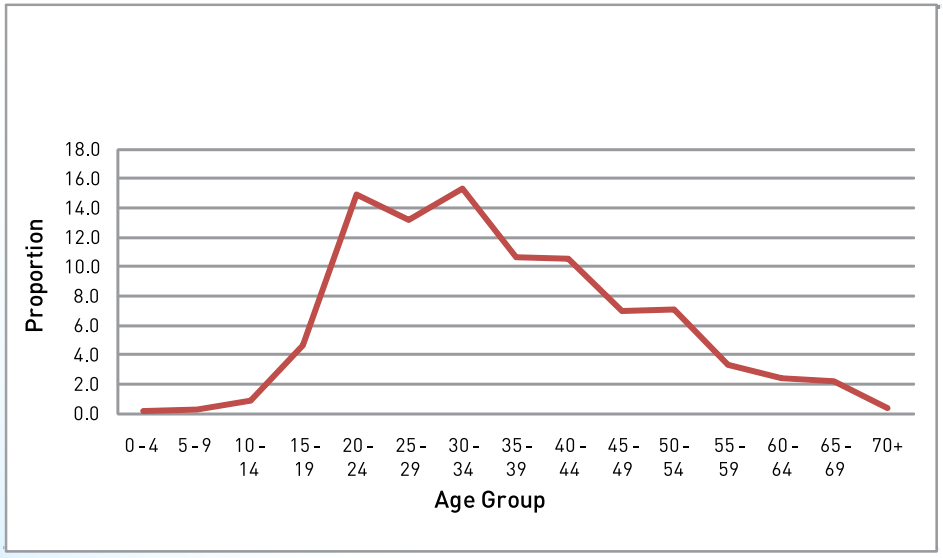
Province	Engaged in internet activities in last 6 months	At least once a day	At least once a week	At least once a month	Once every 3 months	Once every 6 months	Once every year	Total
Nairobi	25.9	16.9	6.2	1.4	0	4	3	3,024,059
Central	6.7	3.4	2.1	6	1	0	1	4,111,046
Coast	3.5	1.4	1.4		2	0	0	3,293,639
Eastern	4.2	2	1.7	6	5	5	4	4,017,958
North Eastern	3.7	1.1	1.3	1.1	1	0	0	1,228,945
Nyanza	5.5	3.6	1.3	3	1	1	1	4,629,954
Rift Valley	4.8	1.7	1.3	1.4	0	0	2	10,217,921
Western	1.4	8	4	0	0	0	0	4,045,792
Place of Residence								
Rural	2.7	9	8	7	1	0	0	24,730,955
Urban	15.5	8.8	4.1	1.1	3	3	5	9,838,358
Sex								
Male	7.5	3.9	2.0	1.0	2	2	1	17,082,230
Female	5.2	2.4	1.6	6	1	0	2	17,487,083
Age								
0 - 4 yrs	2	1	2	0	0	0	0	1,844,771
5 - 9 yrs	3	2	1	0	0	0	0	5,139,627
10 - 14 yrs	9	4	4	1	0	0	0	5,058,472
15 - 19 yrs	4.6	1.6	1.8	3	2	3	3	3,922,314
20 - 24 yrs	14.9	6.6	4.4	2.6	2	4	2	3,481,259
25 - 29 yrs	13.2	6.8	3.9	1.3	3	2	2	2,972,159
30 - 34 yrs	15.4	8.8	2.2	3.6	3	0	0	2,674,732
35 - 39 yrs	10.6	6.1	2.3	7	0	1	1.1	2,078,368
40 - 44 yrs	10.6	5.7	2.7	5	1	5	7	1,522,959
45 - 49 yrs	7.0	3.9	2.0	4	4	0	0	1,428,640
50 - 54 yrs	7.1	2.6	3.8	6	0	0	0	1,158,931
55 - 59 yrs	3.3	2.3	.4	2	0	0	1	799,906
60 - 64 yrs	2.3	1.0	1.1	2	1	0	0	731,303
65 - 69 yrs	2.2	8	1.2	2	0	0	1	491,664
70+ yrs	4	1	2	1	0	0	0	1,264,207

Table 4.4: Percentage Distribution of People with Internet activities in the last 6 months by frequency of use (3+) (Continued)

	Engaged in internet activities in last 6 months	At least once a day	At least once a week	At least once a month	Once every 3 months	Once every 6 months	Once every year	Total
Level of Education								
Pre Primary	8	4	4	0	0	0	0	1,307,291
Primary	2.0	7	6	4	0	1	0	17,819,366
Secondary	12.4	4.6	3.9	2.3	4	3	6	5,863,398
Higher	59.5	38.5	14.1	3.2	5	5	1.2	1,718,180
None	8	2	4	2	0	0	0	7,795,186
Non Standard	28.6	28.6	0	0	0	0	0	42,817
DK	1.3	1.3	0	0	0	0	0	23,075
Total	**6.3**	**3.2**	**1.8**	**8**	**1**	**1**	**2**	**34,569,313**

Figure 4.5 shows the proportion of population that had used internet in the six months preceding the survey by various age cohorts. The figure indicates that use of internet rises with age but peaks at around the ages 20 to 34 but then declines with increase in age. Specifically, those aged 30-34 years had the highest proportion of internet users with 15.4 per cent reporting having used it during the last six months. Age group 20-24 was second with 14.9 per cent having engaged in internet activities while 25-29 years was third with 13.2 per cent.

Figure 4.5: Use of Internet by Age in the Six Months Preceding the Survey



Details on place of internet access for the users during 12 months prior to the survey are presented in Table 4.5. Cybercafés were the most popular places where up to 52.7 per cent of the users accessed internet services. Mobile phone, work place and own home were the other reliable sources with 33.9, 27.7 and 24.1 per cent of users accessing internet through them respectively.

A look at Table 4.5 reveals that age is a factor in determining one's main source of internet services. Persons aged 14 years and below appear to have access to internet mainly from their homes while those aged 15 to 39 years reported cybercafés as their preferred place of internet access. Between ages 40 to 54 years, most persons access internet at their work place while for those aged 55 years and above mainly access internet at their homes. Although mobile phone was the second mostly used form of access to internet, none of the age groups reported it as the mode of access.

Table 4.5: Percentage Distribution of People with Access to Internet in the last 12 months by place of Use (3+)

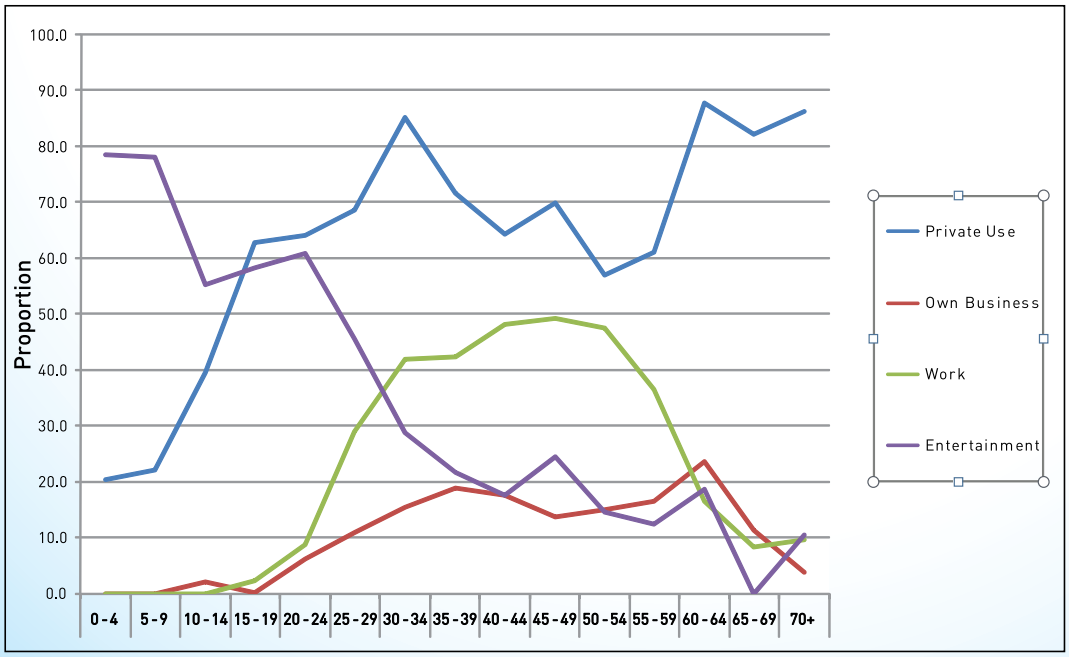
Province	Own house	Friends house	Work place	Cybercafe	Com-munity centre	Educa-tional centre	Mobile phone	Other	Total
Nairobi	37.1	3.7	33.6	44.4	0	10.7	27.8	6	781,911
Central	28.2	3.1	32.3	47.1	0	9.6	27.2	1.4	274,776
Coast	19.7	9.2	13.2	54.8	0	3.9	26.1	.0	113,971
Eastern	4.7	1.7	15.8	64.4	3	18.3	34.8	6.2	167,109
North Eastern	0	0	3.0	55.4	0	15.9	65.4	0	45,498
Nyanza	22.8	3.6	32.3	63.6	4.2	16.2	29.3	9	255,621
Rift Valley	12.5	2.0	23.5	57.5	1.9	17.3	49.0	0	491,733
Western	15.2	0	24.1	64.9	0	7.1	26.2	0	56,305
Place of Residence									
Rural	15.3	3.1	20.5	51.1	1.6	15.2	43.3	2.1	658,632
Urban	27.8	3.3	30.8	53.4	7	12.0	29.8	5	1,528,292
Sex									
Male	22.4	3.8	31.5	52.3	1.4	11.6	36.7	1.3	1,279,043
Female	26.5	2.3	22.3	53.3	3	14.7	29.9	5	907,881
Age									
0 - 4 yrs	20.4	0	0	0	0	0	0	0	3,180
5 - 9 yrs	49.8	0	0	0	0	13.5	25.6	17.1	13,327
10 - 14 yrs	45.5	4.3	0	10.1	0	37.2	22.2	0	43,038
15 - 19 yrs	15.5	6.5	0	53.4	0	32.5	30.8	0	181,666
20 - 24 yrs	20.2	3.3	7.8	57.2	2.0	25.2	46.4	1.4	518,934
25 - 29 yrs	24.4	5.1	25.5	57.5	1.3	12.4	34.7	3	393,249
30 - 34 yrs	17.0	1.6	46.6	65.7	0	3.8	40.2	3	410,645
35 - 39 yrs	29.4	2.9	39.6	51.2	8	0	17.6	8	221,060
40 - 44 yrs	30.2	1.0	46.9	43.9	0	2.5	21.8	3.3	160,813
45 - 49 yrs	42.9	2	46.9	32.8	7	4.4	24.5	0	99,618
50 - 54 yrs	22.0	3.3	60.9	33.1	4.0	2.3	22.7	0	82,131

Table 4.5: Percentage Distribution of People with Access to Internet in the last 12 months by place of Use (3+) (Continued)

	Own house	Friends house	Work place	Cybercafe	Com-munity centre	Educa-tional centre	Mobile phone	Other	Total
55 - 59 yrs	45.7	0	34.1	35.1	0	0	14.5	0	26,543
60 - 64 yrs	42.2	0	13.8	26.0	0	0	28.1	5.2	17,126
65 - 69 yrs	36.7	13.8	22.3	12.6	0	0	31.3	8.2	10,764
70+ yrs	62.2	0	6.0	18.2	0	0	17.5	0	4,830
Level of Education									
Pre Primary	16.9	21.1	0	21.1	0	38.9	34.5	0	10,133
Primary	21.3	4.0	14.5	38.4	1	11.8	36.0	9	352,999
Secondary	16.8	3.2	20.5	60.7	4	11.7	40.5	1.2	728,612
Higher	30.4	2.8	38.5	51.6	1.7	14.0	29.9	8	1,022,952
None	14.2	2.0	13.4	59.7	8	8.4	8.6	0	59,698
Non Standard	60.6	0	30.3	84.9	0	30.3	30.3	0	12,229
DK	100.0	0	0	0	0	0	0	0	302
Total	**24.1**	**3.2**	**27.7**	**52.7**	**1.0**	**12.9**	**33.9**	**1.0**	**2,186,924**

Figure 4.6 depicts how proportions of the population with access to internet vary with rise in age. The figure shows that while proportion of internet users for private purposes increased with rise in age, the proportion of users for entertainment motives declined. Use of internet for work related activities rose with age to peak at 45-49 years then gradually declined as age advanced. Users of internet for own business showed similar patterns but peaked at the age 60-64 years.

Figure 4.6: Percentage Distribution of People with Access to Internet by Purpose of Use



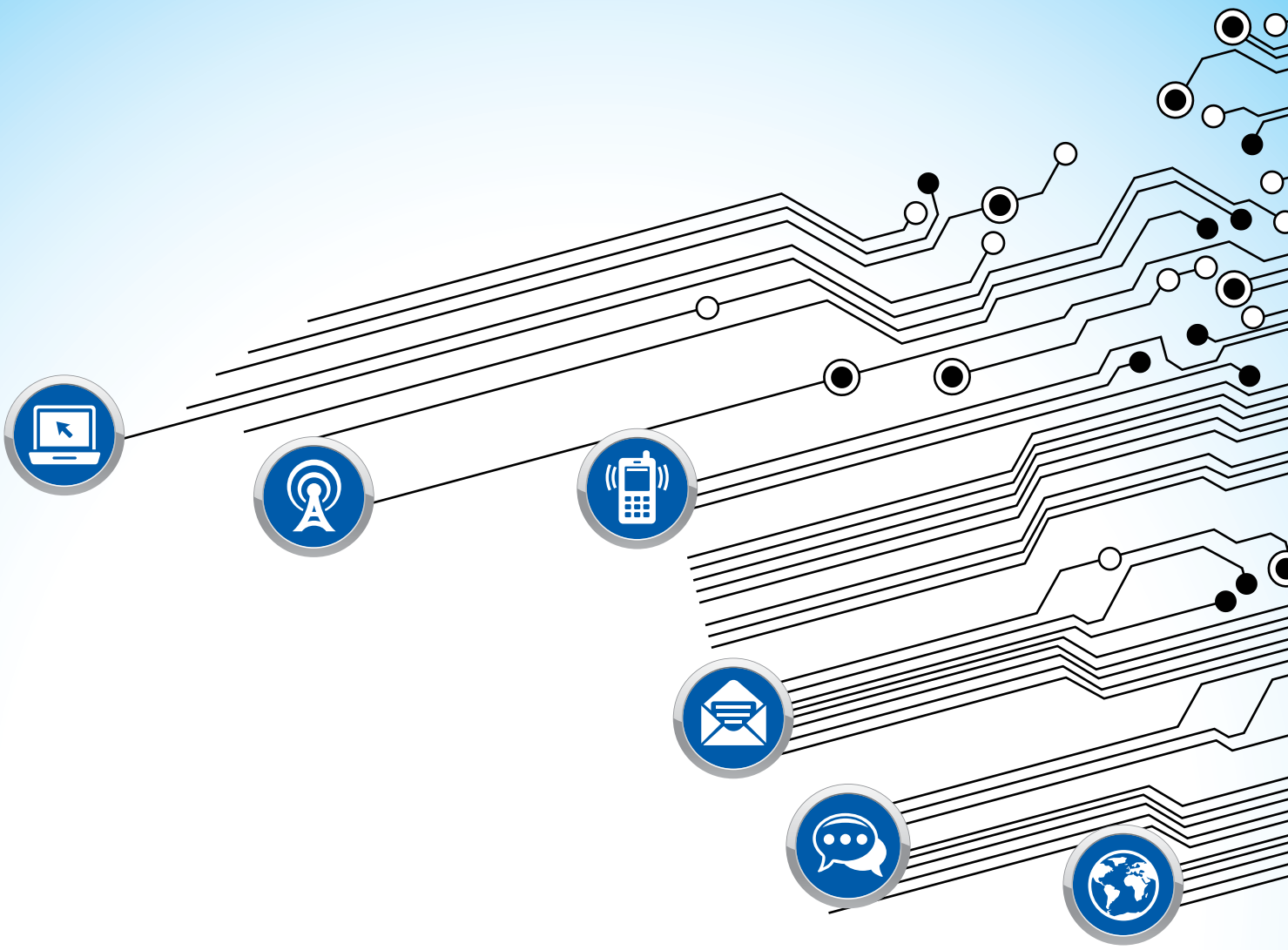
Details on distribution of population with access to Internet by purpose of use in the six months preceding the survey are presented in Table 4.6. Two out of three internet users indicated private use as one of their purposes while entertainment and work related activities were affirmed as other key uses by 27.8 per cent of the Internet clientele. Entertainment was mainly associated with those aged 3 to 24 years while use of Internet for work was prevalent among the 30 to 54 age group.

Table 4.6: Percentage Distribution of People with Access to Internet use by Purpose of Use (3+)

Province	Private Use	Own business	Work	Entertainment	Health	Other	Total
Nairobi	72.8	16.1	34.2	38.2	3.1	12.5	781,911
Central	59.6	15.3	26.0	44.5	7.2	10.2	274,776
Coast	69.7	11.7	22.4	42.6	4.2	5.9	113,971
Eastern	67.0	7	15.5	38.1	4.5	14.8	167,109
North Eastern	42.0	4.4	5.6	60.7	0	6.6	45,498
Nyanza	68.5	4.7	33.9	55.1	3.1	7.8	255,621
Rift Valley	73.1	7.6	23.5	31.4	2.2	6.6	491,733
Western	58.8	22.8	23.6	37.3	2.3	5.5	56,305
Place of Residence							
Rural	65.8	7.1	19.5	38.9	2.8	8.8	658,632
Urban	70.5	13.1	31.4	40.6	3.8	10.3	1,528,292
Sex							
Male	68.9	12.6	31.2	41.9	3.4	9.9	1,279,043
Female	69.4	9.5	23.0	37.6	3.6	9.7	907,881
Age							
0 - 4 yrs	20.4	0	0	78.7	0	0	3,180
5 - 9 yrs	22.2	0	0	78.2	0	12.2	13,327
10 - 14 yrs	39.6	2.1	0	55.4	0	13.5	43,038
15 - 19 yrs	63.0	.2	2.4	58.4	3.5	20.6	181,666
20 - 24 yrs	64.0	6.3	8.7	60.8	3.2	13.0	518,934
25 - 29 yrs	68.6	11.0	29.0	45.6	4.7	13.5	393,249
30 - 34 yrs	85.4	15.4	41.9	28.9	2.1	4.7	410,645
35 - 39 yrs	71.8	18.9	42.3	21.7	7	4.7	221,060
40 - 44 yrs	64.4	17.7	48.1	17.6	4.0	5.4	160,813
45 - 49 yrs	70.1	13.8	49.2	24.7	13.5	6	99,618
50 - 54 yrs	57.0	15.1	47.5	14.6	3.4	7.4	82,131
55 - 59 yrs	61.2	16.6	36.6	12.6	2.1	7.7	26,543
60 - 64 yrs	87.9	23.7	16.6	18.8	3.5	5.2	17,126
65 - 69 yrs	82.3	11.3	8.4	0	6.8	8.2	10,764

Table 4.6: Percentage Distribution of People with Access to Internet use by Purpose of Use (3+) (Continued)

	Private Use	Own business	Work	Entertainment	Health	Other	Total
70+ yrs	86.3	3.8	9.8	10.5	3.8	29.7	4,830
Level of Education							
Pre Primary	73.4	21.1	0	54.4	0	1.9	10,133
Primary	50.2	9.1	15.2	43.5	7	7.9	352,999
Secondary	72.8	14.2	17.5	40.1	2.6	8.2	728,612
Higher	73.7	9.9	40.9	39.3	5.1	11.2	1,022,952
None	66.9	6.7	11.2	24.6	3.8	8.7	59,698
Non Standard	10.6	30.3	15.1	71.1	0	59.1	12,229
DK	100.0	100.0	100.0	100.0	100.0	.0	302
Total	**69.1**	**11.3**	**27.8**	**40.1**	**3.5**	**9.8**	**2,186,924**



Details on internet activities by users are presented in Table 4.7. Close to three out of five users consumed internet services for communication while one out of five users engaged in research activities. The data suggests that Kenyans are yet to take full advantage of transacting business on the internet; for example only 2.1 per cent of the users reported having engaged in internet banking. In addition, only 4.4 per cent of users purchased or placed orders for goods and services online though 12.1 per cent looked for information about goods and services through the internet.

Table 4.7: Percentage Distribution of People with Access to Internet use by Internet activities in last 6 months (3+)

	Place of Computer use in last 12 Months										
Province	Commu-nicating	Information about goods and services	Informa-tion from Government organization	Reading/ downloading materials	Playing computer games	Watching movies/ TV	Informa-tion related to health/ health services	Purchasing or ordering goods and services	Internet banking	Research	Total
Nairobi	65.5	16.4	13.3	12.9	10.1	9.3	5.5	6.8	4.3	29.6	781,911
Central	63.9	19.6	11.2	25.5	24.3	12.4	8.8	8.9	2.3	24.7	274,776
Coast	59.2	11.0	6.9	5.0	9.1	5.8	5.2	.8	2.9	27.3	113,971
Eastern	42.3	8.6	5.3	5.4	16.9	12.4	2.2	3.8	0	11.5	167,109
North Eastern	59.9	7.4	15.5	23.2	24.8	21.5	1.6	0	0	9.9	45,498
Nyanza	53.8	2.7	25.0	16.4	8.6	13.8	8.7	0	6	21.5	255,621
Rift Valley	50.3	6.9	4.7	6.7	14.6	5.2	2.4	7	0	10.2	491,733
Western	48.7	21.6	15.8	15.1	9.7	9.2	9.3	13.9	0	24.4	56,305
Place of Residence											
Rural	50.6	6.8	10.0	12.4	17.0	8.4	4.1	.9	9	17.6	658,632
Urban	61.0	14.4	12.4	13.0	12.0	10.1	5.9	5.9	2.6	23.3	1,528,292
Sex											
Male	58.1	13.4	12.5	14.3	16.8	11.1	4.1	4.8	2.2	23.2	1,279,043
Female	57.6	10.3	10.4	10.7	8.9	7.4	7.1	3.8	1.8	19.4	907,881
Age											
0 - 4 yrs	20.4	0	0	0	58.3	0	0	0	0	0	3,180
5 - 9 yrs	27.1	0	0	0	28.0	1.4	0	0	0	0	13,327
10 - 14 yrs	27.3	0	0	5.8	41.3	18.6	0	0	0	2.7	43,038
15 - 19 yrs	46.4	1.0	1.7	13.3	22.6	12.7	2.1	1.5	5	22.2	181,666
20 - 24 yrs	48.4	6.2	4.3	15.5	24.9	17.5	3.5	.5	5	23.4	518,934
25 - 29 yrs	57.6	13.3	13.0	12.5	12.0	9.0	6.1	6.8	2.4	23.6	393,249
30 - 34 yrs	70.2	11.2	8.5	9.4	9.2	7.0	3.8	4.8	2.6	18.6	410,645
35 - 39 yrs	66.0	17.8	18.5	16.1	2.1	5.4	8.8	7.6	2.0	21.2	221,060

Table 4.7: Percentage Distribution of People with Access to Internet use by Internet activities in last 6 months (3+) (Continued)

	Place of Computer use in last 12 Months										
	Commu-nicating	Information about goods and services	Informa-tion from Government organization	Reading/ downloading materials	Playing computer games	Watching movies/ TV	Informa-tion related to health/ health services	Purchasing or ordering goods and services	Internet banking	Research	Total
40 - 44 yrs	64.4	36.8	27.2	13.1	6	4.0	11.5	11.5	4.1	26.1	160,813
45 - 49 yrs	66.4	11.9	26.9	14.0	8.5	3.9	14.6	4.8	1.7	25.0	99,618
50 - 54 yrs	65.2	14.9	32.4	11.0	2.1	1.2	2.3	2.6	4.9	19.6	82,131
55 - 59 yrs	46.0	33.3	13.7	5	0	0	1.7	3.6	9.5	13.7	26,543
60 - 64 yrs	44.9	3.7	3.4	16.1	1.8	0	3.2	6.5	.8	30.1	17,126
65 - 69 yrs	50.5	8.1	1.3	15.2	0	0	0	1.3	18.6	6.8	10,764
70+ yrs	97.8	3.8	11.4	7.6	0	0	3.8	0	7.6	16.0	4,830
Level of Education											
Pre Primary	22.9	0	0	1.9	57.2	21.1	0	0	0	21.1	10,133
Primary	42.2	7.6	6.8	8.7	24.3	7.7	3.0	1.9	1.2	15.0	352,999
Secondary	65.2	12.6	8.2	13.8	16.1	10.2	2.7	7.2	.8	16.4	728,612
Higher	58.9	14.1	15.8	13.6	7.9	10.0	8.5	3.7	3.2	28.4	1,022,952
None	50.5	4.3	13.4	9.7	8.4	3.4	2	0	3.3	8.9	59,698
Non Standard	56.0	0	15.1	30.3	0	15.1	0	0	0	15.1	12,229
DK	0	0	0	0	0	.0	0	0	0	0	302
Total	**57.9**	**12.1**	**11.6**	**12.8**	**13.5**	**9.6**	**5.4**	**4.4**	**2.1**	**21.6**	**2,186,924**

Table 4.8 presents details of calls made during the seven days before the survey. On average mobile users made 21 calls during the last seven days prior to the date of interview which lasted a total of 54.9 minutes and cost about Kenya Shilling 4 per minute. Regionally, people from Nairobi led in terms of the frequency with each person using a mobile having made 34 calls. People in urban areas reported more usage of mobile phones compared to their counterparts in the rural areas. The data shows that on average people in rural areas made 15 calls in the seven days while those in urban made 30 calls. The calls in the urban areas lasted longer (2.9 minutes) compared to rural areas which on average lasted for 2.2 minutes.

Table 4.8: Mean Number of Times, Mean Amount Spend and Length of Mobile calls in the last seven days (3+)

Province	Use of Mobile phone in last 12 months	Number of Times	Length of use (Mins)	Cost (Kshs.)	Total
Nairobi	**73.0**	**33.6**	**109.4**	**366.9**	**3,024,059**
Central	65.8	22.5	29.9	213.3	4,111,046
Coast	40.5	28.6	59.7	274.3	3,293,639
Eastern	62.4	13.9	35.2	123.3	4,017,958
North Eastern	30.7	22.3	68.2	334.6	1,228,945
Nyanza	50.3	22.6	52.8	267.8	4,629,954
Rift Valley	49.4	17.0	55.6	180.0	10,217,921
Western	40.7	14.5	38.0	187.9	4,045,792
Place of Residence					
Rural	46.7	15.3	33.7	152.6	24,730,955
Urban	67.1	30.3	87.6	336.6	9,838,358
Sex					
Male	53.6	24.5	67.1	272.3	17,082,230
Female	51.4	17.5	42.0	173.8	17,487,083
Age					
0 - 4 yrs	9.2	2.3	273.1	29.9	1,844,771
5 - 9 yrs	13.7	1.0	1.8	4.0	5,139,627
10 - 14 yrs	24.4	2.2	5.4	13.8	5,058,472
15 - 19 yrs	44.3	9.5	20.0	77.5	3,922,314
20 - 24 yrs	75.7	20.5	51.3	172.3	3,481,259
25 - 29 yrs	80.5	25.7	55.1	255.0	2,972,159
30 - 34 yrs	83.5	30.1	65.7	330.9	2,674,732
35 - 39 yrs	83.1	26.3	67.0	298.4	2,078,368
40 - 44 yrs	80.9	28.1	63.8	313.2	1,522,959
45 - 49 yrs	82.9	26.5	68.9	296.4	1,428,640
50 - 54 yrs	78.0	27.3	76.5	305.0	1,158,931
55 - 59 yrs	77.0	22.6	72.0	247.9	799,906
60 - 64 yrs	67.6	21.7	65.9	260.1	731,303

Table 4.8: Mean Number of Times, Mean Amount Spend and Length of Mobile calls in the last seven days (3+) (Continued)

	Use of Mobile phone in last 12 months	Number of Times	length of use (Mins)	Cost (Kshs.)	Total
65 - 69 yrs	64.6	15.1	47.4	192.2	491,664
70+ yrs	45.2	10.2	28.1	157.0	1,264,207
Level of Education					
Pre Primary	18.6	8.2	16.3	73.9	1,307,291
Primary	51.7	16.1	38.8	173.7	17,819,366
Secondary	78.1	25.7	59.4	249.0	5,863,398
Higher	95.8	47.9	124.9	554.9	1,718,180
None	31.2	11.3	60.3	123.1	7,795,186
Non Standard	73.9	101.2	13.7	147.4	42,817
DK	47.5	11.7	22.8	146.7	23,075
Total	**52.5**	**21.0**	**54.9**	**223.7**	**34,569,313**

4.5 Ownership

Table 4.9 presents information on ownership of basic household ICT equipments and internet connectivity in the country. Ownership and Internet connectivity varied with age and region. Nationally, mobile phone ownership was reported by the highest percentage of the population at 33.0 per cent while ownership of radio and television was recorded at 23.4 and 10.6 per cent respectively. Internet connectivity and ownership of computers was reported by substantially small proportions of 2.4 and 1.8 per cent of the population, respectively.

As expected, ownership of these facilities had a relationship with the level of one's education, with proportions of those with higher level of education being bigger than all other categories for all the equipments and internet connectivity. There was a notable disparity on ownership between male and female, with 33.9 per cent of males owning radios compared to 13.1 per cent for females. Likewise 15.2 per cent of males owned TVs against 6.1 per cent of the female counterparts. However, ownership of mobile phones stood at 35.7 and 30.1 per cent for males and females respectively.

Across the regions, Nairobi led in ownership of all the equipments followed by Central in all cases while Rift Valley was third in most of the items. North Eastern was last in all instances except for internet connectivity where Eastern was the last. North Eastern had higher internet connectivity than Coast, Eastern and Western provinces despite having lower proportion of computer ownership. This is attributable to convergence of the technologies where many of the internet users in North Eastern connect through their mobile phones (as reported in Table 4.5 compared with their counterparts in the other provinces). Along the different age groups, ownership of radio and TV was highest for the ages 50 - 54 while ownership of mobile phones, computers and internet connectivity was highest for ages 30 - 34.

Table 4.9: Percentage Distribution of Population who Own Basic Household Equipment (3+)

Province	Radio	Television	Mobile phone	Computer	Internet connectivity	Total
Nairobi	**31.2**	**27.3**	**58.7**	**8.9**	**10.5**	**3,024,059**
Central	30.3	14.1	43.7	1.8	2.4	4,111,046
Coast	19.3	8.3	27.9	9	9	3,293,639
Eastern	21.8	7.4	31.4	3	6	4,017,958
North Eastern	14.9	2.5	19.3	2	2.2	1,228,945
Nyanza	21.3	7.1	26.4	1.5	2	4,629,954
Rift Valley	23.5	10.6	31.2	1.5	2.2	10,217,921
Western	20.	6.2	24.5	4	4	4,045,792
Place of Residence						
Rural	20.9	6.1	25.8	.7	1.2	24,730,955
Urban	29.5	22.0	51	4.6	5.4	9,838,358
Sex						
Male	33.9	15.2	35.7	2.4	3.2	17,082,230
Female	13.1	6.1	30.2	1.2	1.6	17,487,083
Age						
0 - 4 yrs	2.2	1	6	3	.2	1,844,771
5 - 9 yrs	1.8	7	8	2	.1	5,139,627
10 - 14 yrs	1.9	5	2.2	1	2	5,058,472
15 - 19 yrs	6.9	2.2	13.8	4	9	3,922,314
20 - 24 yrs	18.9	7.8	52.0	2.5	5.5	3,481,259
25 - 29 yrs	32	16	63.1	2.5	5.1	2,972,159
30 - 34 yrs	46.3	26.6	67.8	4.8	6.6	2,674,732
35 - 39 yrs	45.5	21.3	64.9	3.8	3	2,078,368
40 - 44 yrs	53.4	25.5	63.5	4.2	4.9	1,522,959
45 - 49 yrs	50.8	25.6	65.2	4.0	3.6	1,428,640
50 - 54 yrs	58.2	27	57.6	4.1	3.3	1,158,931
55 - 59 yrs	52.5	21.7	57.2	2.5	2	799,906
60 - 64 yrs	51.8	17.6	44.3	2	1.5	731,303
65 - 69 yrs	52.2	15.9	41.7	1.8	1.4	491,664
70+ yrs	41.1	12.2	22.7	8	5	1,264,207
Level of Education						
Pre Primary	6.1	4	4.3	1.2	6	1,307,291
Primary	22.1	8.1	29.1	.5	8	17,819,366
Secondary	35.1	20.4	60.5	2.3	4.5	5,863,398
Higher	51.6	42.2	89.3	20.4	22.9	1,718,180

Table 4.9: Percentage Distribution of Population who OwnBasic Household Equipment (3+) (Continued)

	Radio	Television	Mobile phone	Computer	Internet connectivity	Total
None	14	3.1	13.4	2	2	7,795,186
Non Standard	41.6	25.3	51.6	15.6	21.2	42,817
DK	55.9	10.2	52.1	2.3	1.3	23,075
Total	**23.4**	**10.6**	**33.0**	**1.8**	**2.4**	**34,569,313**

Table 4.10 presents details on internet connectivity and average expenditure on the same. The highest proportion (4.7 percent) used fixed line type of connectivity while the mean cost per month spent on Internet was KShs. 917.5

Table 4.10: Percentage Distribution of Population who Own Internet Connectivity and Average Spend on Internet by Type of Connectivity (3+)

Province	Fixed line	Satellite (VSAT)	Mobile phone	Mobile modem	Other	Mean Amount spent on Internet (per Month)	Total
Nairobi	7.9	2.2	3	0	0	1,355.0	318,664
Central	0	0	0	0	0	929.7	96,649
Coast	8	0	0	0	0	488.1	30,003
Eastern	8.3	0	0	0	0	181.5	26,072
North Eastern	0	0	0	0	0	373.5	27,306
Nyanza	9.7	1.4	0	0	0	1,061.0	93,734
Rift Valley	1.4	1.4	0	3	0	437.5	228,605
Western	0	0	0	0	0	742.8	16,613
Place of Residence							
Rural	7	1.3	0	2	0	524.8	308,453
Urban	7.1	1.4	2	0	0	1,139.4	529,193
Sex							
Male	5.4	1.7	0	0	0	995.1	549,417
Female	3.5	7	3	2	0	763.0	288,229
Age							
0 - 4 yrs	0	0	0	0	0		3,248
5 - 9 yrs	0	0	0	0	0	188.3	5,483
10 - 14 yrs	2.4	.0	0	0	0	237.6	7,799
15 - 19 yrs	7.6	2.5	2.5	0	0	636.7	34,131
20 - 24 yrs	1.8	1.7	0	0	0	410.5	190,911
25 - 29 yrs	3.4	1.2	0	4	0	864.1	152,663

Table 4.10: Percentage Distribution of People who Own Internet Connectivity and Average Spend on Internet by Type of Connectivity (3+) (Continued)

	Fixed line	Satellite (VSAT)	Mobile phone	Mobile modem	Other	Mean Amount spent on Internet (per Month)	Total
30 - 34 yrs	7	1	0	0	0	741.4	176,479
35 - 39 yrs	5.7	4.5	0	0	0	1,361.4	61,879
40 - 44 yrs	11.3	4	0	0	0	1,151.7	74,460
45 - 49 yrs	14.9	8	0	0	0	1,412.2	52,012
50 - 54 yrs	4.5	5.2	0	0	0	2,137.4	38,730
55 - 59 yrs	10.2	0	0	0	0	1,392.6	15,937
60 - 64 yrs	17.8	0	0	0	0	3,314.7	10,880
65 - 69 yrs	3.9	0	0	0	0	644	6,901
70+ yrs	29.3	0	0	0	0	2,767.6	6,133
Level of Education							
Pre Primary	2.3	0	0	0	0	480.2	8,294
Primary	1.8	2.5	0	4	0	1,000.3	147,343
Secondary	1.4	2.4	3	0	0	499.5	266,431
Higher	8.1	4	0	0	0	1,159.3	392,976
None	9.1	0	0	0	0	2,313.8	13,213
Non Standard	0	0	0	0	0	1,000	9,086
DK	0	0	0	0	0	1,000	302
Total	**4.7**	**1.4**	**1**	**1**	**0**	**917.5**	**837,646**

4.6 Postal Services

Nairobi reported the highest proportion of its population having access to private letter boxes at 22.6 per cent followed by Central Province at 18.8 per cent (Table 4.11). Interestingly, 85.8 per cent of people from Central Province indicated having not sent any letters during the 12 months preceding the survey despite the province having reported the second highest proportion of population with access to private letter boxes. North Eastern had the highest proportion of persons who sent letters with 42.0 per cent indicating having sent between 1 to 10 letters annually. In all the provinces, only a small percentage of population send more than ten letters per year. Nationally, the proportion of males with access to private letter boxes is slightly higher than that of females.

Table 4.11: Access to Private Letter Box and Number of Letters Send per year by Province, Sex, Age and Level of Education (3+)

Province	Access to private letterbox	Total	0	1 - 10	11 - 20	More than 20	Missing	Total
Nairobi	22.6	3,024,059	51.3	32.4	3.8	3.0	9.6	683,440
Central	18.8	4,111,046	85.8	9.7	1.2	1.1	2.2	771,980
Coast	5.8	3,293,639	48.6	29.4	4.8	2.5	14.8	191,059
Eastern	2.1	4,017,958	36.1	31.4	.4	1.0	31.0	86,021
North Eastern	7.7	1,228,945	45.5	42.0	2.0	0	10.5	94,115
Nyanza	9.2	4,629,954	68.5	21.2	2.3	2.7	5.2	428,066
Rift Valley	5	10,217,921	52.5	28.7	6.2	5	12.1	512,309
Western	7.4	4,045,792	71.9	23.3	4.4	0	4	297,603
Place of Residence								
Rural	6	24,730,955	69.2	18.5	2.9	1.2	8.3	1,493,246
Urban	16	9,838,358	58.7	28.6	3.8	2.0	6.9	1,571,347
Sex								
Male	9	17,082,230	59.2	27.7	4.8	1.9	6.5	1,542,620
Female	8.7	17,487,083	68.5	19.7	1.8	1.3	8.7	1,521,973
Age								
0 - 4 yrs	4.5	1,844,771	75.2	.8	.0	0	24	83,902
5 - 9 yrs	5.7	5,139,627	82.5	4.5	0	0	12.9	292,765
10 - 14 yrs	4.9	5,058,472	91.3	4.7	3	0	3.6	247,530
15 - 19 yrs	7	3,922,314	77.5	13.1	6	3	8.6	274,831
20 - 24 yrs	10.1	3,481,259	54	30.7	3.1	8	11.4	353,324
25 - 29 yrs	10.1	2,972,159	62.7	24.8	2.5	1.3	8.6	299,516
30 - 34 yrs	11.8	2,674,732	46.5	35.5	10.6	3.2	4.2	315,224
35 - 39 yrs	13.7	2,078,368	54	33.7	4.4	3.2	4.7	284,304
40 - 44 yrs	12	1,522,959	57.9	33	4.1	2.3	2.7	182,628
45 - 49 yrs	14.4	1,428,640	47.2	33.8	4.7	2.8	11.5	205,535
50 - 54 yrs	13.9	1,158,931	58.3	32.8	3.8	3.4	1.7	161,644
55 - 59 yrs	11.6	799,906	56.7	32.3	4.7	1.7	4.5	92,430
60 - 64 yrs	12.6	731,303	63.5	28.2	3.8	1.8	2.7	92,027
65 - 69 yrs	13.6	491,664	55.1	35	2.4	3.8	3.7	66,939
70+ yrs	8.9	1,264,207	79.6	11.1	1.4	4	7.5	111,992

Table 4.11: Access to Private Letter Box and Number of Letters Send per year by Province, Sex, Age and Level of Education (3+) (Continued)

	Access to private letter box	Total	0	1 - 10	11 - 20	More than 20	Missing	Total
Level of Education								
Pre Primary	7.2	1,307,291	82.2	0	0	0	17.8	94,120
Primary	7.1	17,819,366	74.5	17.5	1.5	7	5.8	1,263,032
Secondary	13.6	5,863,398	59.1	28.1	5.8	1.5	5.5	796,438
Higher	33	1,718,180	43.1	42.1	5.7	4.9	4.2	566,679
None	4.3	7,795,186	64.3	12.5	1.2	1	21.8	335,703
Non Standard	8.7	42,817	69.5	0	0	0	30.5	3,731
DK	21.2	23,075	89.3	10.7	0	0	0	4,888
Total	**8.9**	**34,569,313**	**63.8**	**23.7**	**3.3**	**1.6**	**7.6**	**3,064,593**

4.7 Letters Sent

Details on destinations of letters sent are presented in Table 4.12. On the whole, only 5 per cent of the population sent letters in the 12 months prior to the survey. Only 3.2 per cent of rural population compared to 8.7 per cent of urban population sent letters. At least one (1) in every 20 people from urban areas reported having sent a letter while one (1) in 29 people from rural areas had sent at least one letter.

Table 4.12: Proportion of Letters send Abroad by Province, Sex, Age and Level of Education (3+)

Province	Locally	Elsewhere in Kenya	Overseas	Total
Nairobi	4.2	3.3	1.5	3,024,059
Central	3.0	1.4	2	4,111,046
Coast	2.4	7	4	3,293,639
Eastern	3.6	3.2	.2	4,017,958
North Eastern	3.3	1.4	1	1,228,945
Nyanza	3.3	2.8	3	4,629,954
Rift Valley	1.2	1.7	4	10,217,921
Western	1.8	5	1	4,045,792
Place of Residence				
Rural	1.7	1.3	2	24,730,955
Urban	4.6	3.4	7	9,838,358
Sex				
Male	3.0	2.4	5	17,082,230
Female	2.0	1.3	2	17,487,083
Age				
0 - 4 yrs	0	0	0	1,844,771
5 - 9 yrs	1	1	0	5,139,627
10 - 14 yrs	5	3	0	5,058,472
15 - 19 yrs	1.5	1.4	1	3,922,314
20 - 24 yrs	4.2	3.4	5	3,481,259
25 - 29 yrs	3.3	2.3	4	2,972,159
30 - 34 yrs	4.1	3.4	1.5	2,674,732
35 - 39 yrs	5.7	4.2	8	2,078,368
40 - 44 yrs	4.6	4.1	3	1,522,959
45 - 49 yrs	5.5	2.9	6	1,428,640
50 - 54 yrs	5.6	4.0	7	1,158,931
55 - 59 yrs	3.8	2.1		799,906
60 - 64 yrs	2.4	2.6	1.1	731,303
65 - 69 yrs	5.7	2.4	4	491,664
70+ yrs	1.6	1.2	3	1,264,207
Level of Education				
Pre Primary	1	6	1	1,307,291
Primary	1.7	1.3	1	17,819,366

Table 4.12: Proportion of Letters send Abroad by Province, Sex, Age and Level of Education (3+) (Continued)

	Locally	Elsewhere in Kenya	Overseas	Total
Secondary	4.7	3.4	6	5,863,398
Higher	13.3	9.1	3.8	1,718,180
None	7	8	1	7,795,186
Non Standard	1.8	2.4	0	42,817
DK	1.3	0	0	23,075
Total	**2.5**	**1.9**	**4**	**34,569,313**

4.8 Letters Received

Three in every four persons across all ages reported not receiving any letter annually. Many of those who reported to have received between one (1) to 10 letters were mainly aged between 20 to 69 years while those who receive more than 20 letters were mainly between 30 and 69 years old. The table also shows that the level of education was a factor in mailing with 43.6 per cent of persons with higher education having received the highest number of letters followed by those with secondary education with a proportion of 15.3 per cent.

Table 4.13: Percentage Distribution of Letters Received per year by Province, Sex, Age and Level of Education (3+)

	Letters received per year					
Province	0	1 - 1	11 - 20	More than 20	Missing	Total
Nairobi	74.1	11.1	3	2.7	9.2	3,024,059
Central	80.7	8	2.1	1.9	7.2	4,111,046
Coast	54.3	4.8	1	8	39.1	3,293,639
Eastern	82.8	7.2	6	2	9.3	4,017,958
North Eastern	84.7	5.1	4	4	9.4	1,228,945
Nyanza	79.4	8.2	8	4	11.2	4,629,954
Rift Valley	74.3	4.9	1.5	5	18.8	10,217,921
Western	89.4	4.3	6	1	5.7	4,045,792
Place of Residence						
Rural	80.6	4.7	9	4	13.5	24,730,955
Urban	67.8	10.7	2.4	1.9	17.2	9,838,358
Sex						
Male	76	7.7	1.6	8	13.9	17,082,230
Female	77.9	5.2	1	7	15.2	17,487,083
Age						
0 - 4 yrs	76.7	1	0	0	23.2	1,844,771
5 - 9 yrs	79.8	4	0	0	19.9	5,139,627
10 - 14 yrs	82.2	1.2	0	0	16.5	5,058,472
15 - 19 yrs	81.4	4.1	1	2	14.2	3,922,314
20 - 24 yrs	75.9	9.9	8	5	13	3,481,259
25 - 29 yrs	77.5	8	1.4	7	12.3	2,972,159
30 - 34 yrs	73.8	10.3	2.5	1.8	11.5	2,674,732
35 - 39 yrs	70.6	12.5	2.4	2.0	12.5	2,078,368
40 - 44 yrs	70.9	13.9	2.9	2.0	10.3	1,522,959
45 - 49 yrs	64.8	13.6	8.3	1.6	11.7	1,428,640
50 - 54 yrs	71.2	12.9	2.6	3.2	10.1	1,158,931
55 - 59 yrs	75.8	11.9	3.2	1.1	8.1	799,906
60 - 64 yrs	76.3	9.1	3.4	1.1	10.1	731,303
65 - 69 yrs	73	13.2	1.2	3.5	9.1	491,664
70+ yrs	78.8	6.2	1.1	7	13.2	1,264,207

Table 4.13: Percentage Distribution of Letters Received per year by Province, Sex, Age and Level of Education (3+) (Continued)

	Letters received per year					
	0	1 - 1	11 - 20	More than 20	Missing	Total
Level of Education						
Pre Primary	76.3	1.1	.2	0	22.4	1,307,291
Primary	79.6	4.5	1.0	5	14.4	17,819,366
Secondary	70.8	11.7	2.3	1.3	13.9	5,863,398
Higher	47.1	31	7	5.6	9.3	1,718,180
None	82.4	2.2	2	1	15.1	7,795,186
Non Standard	41.7	9.8	10.4	0	38.1	42,817
DK	72.5	6.7	0	0	20.8	23,075
Total	**76.9**	**6.4**	**1.3**	**8**	**14.5**	**34,569,313**

CHAPTER 5: HOUSEHOLD CONSUMPTION OF SERVICES

5.0 Introduction

The consumption patterns of households determine the relative importance (weight) of household monetary expenditure attached to each category of goods and services. Table 5.1 shows the percentage distribution of consumption of services in the 12 months preceding the survey by province, urban/rural dimension, sex, age and level of education in multiple response scenarios.

Table 5.1: Percentage Distribution of Consumption of Services in the last 12 months by Province, Sex, Age and Level of Education

	Household Consumption of the following Services						
Province	Health	Education	Entertainment	Transportation	Communi-cation	Other services	Total
Nairobi	71.5	52.8	41.8	84.5	74.0	11.5	1,002,682
Central	72.8	56.4	42.5	79.7	82.8	19.6	1,242,522
Coast	81.3	65.5	29.3	64.3	60.0	.4	773,561
Eastern	82.1	69.2	27.5	82.0	68.9	5.3	947,927
North Eastern	71.7	53.5	12.3	60.2	49.0	5.7	236,775
Nyanza	83.3	68.3	31.1	68.8	67.6	12.7	1,190,945
Rift Valley	79.6	67.3	20.5	79.5	78.5	2.4	2,543,120
Western	87.4	74.6	11.7	69.1	73.4	1	906,971
Place of Residence							
Rural	81.3	68.3	20.1	73.6	70.6	6.7	5,750,812
Urban	75.5	57.9	42.3	80.5	77.9	8.2	3,093,692
Sex							
Male	79.5	67.5	29.6	77.6	75.7	8.0	6,268,960
female	77.6	59.2	24.4	69.8	64.5	5.3	2,312,118
NS	88.5	44.6	16.7	94.5	89.0	6.4	263,426
Age							
15 - 19 yrs	60.2	48.8	44.3	75.9	57.0	14.4	47,590
20 - 24 yrs	63.6	29.5	38.3	76.8	80.1	3.3	417,652
25 - 29 yrs	74.8	42.8	35.2	75.1	79.2	5.3	853,270
30 - 34 yrs	83.8	70.1	33.2	81.3	79.4	7.2	1,275,144
35 - 39 yrs	80.2	79.8	27.3	76.3	73.0	6.7	1,083,849
40 - 44 yrs	81.7	76.9	30.6	76.4	76.5	10.4	916,681
45 - 49 yrs	81.3	79.2	29.1	80.9	79.0	8.3	856,485
50 - 54 yrs	77.2	72.2	29.1	78.5	70.8	6.1	829,426
55 - 59 yrs	76.6	70.3	23.4	72.7	72.2	10.4	524,705
60 - 64 yrs	76.0	57.9	21.4	69.1	68.3	7.4	525,509
65 - 69 yrs	80.5	60.9	20.1	71.0	65.0	7.3	363,925
70+ yrs	81.9	51.4	15.4	63.8	51.4	6.2	886,841

Table 5.1: Percentage Distribution of Consumption of Services in the last 12 months by Province, Sex, Age and Level of Education (Continued)

	Household Consumption of the following Services						
	Health	Education	Entertainment	Transpor-tation	Communi-cation	Other services	Total
Level of Education							
Pre Primary	83.5	68.2	26.0	88.5	78.2	1.6	42,385
Primary	77.7	66.4	24.4	73.6	74.7	5.8	3,889,986
Secondary	80.0	66.8	36.8	83.8	82.1	12.0	1,978,136
Higher	81.5	69.0	61.4	90.5	86.3	11.4	791,486
None	79.5	59.8	12.6	64.1	52.5	3.5	1,853,483
Non Standard	92.9	42.7	71.5	60.9	82.3	15.2	12,156
DK	54.5	75.5	21.5	56.0	59.5	13.8	13,446
NS	88.5	44.6	16.7	94.5	89.0	6.4	263,426
Total	**79.3**	**64.7**	**27.8**	**76.0**	**73.2**	**7.2**	**8,844,504**

5.1 Proportions in Consumption of Services

Central Province recorded the highest percentage of consumption of communication services (82.8 per cent), while North Eastern recorded the lowest (49.0 per cent). Male-headed households consumed relatively higher proportion of communication services (75.7 per cent) compared to female-headed households (64.5 per cent). Analysis by age group reveals that the consumption was more widespread in the 20-24 age bracket at 80.1 per cent.

The survey also reveals that the consumption of communication services is positively correlated with the level of education attained and also tends to be positively skewed towards the urban areas.

Only 27.8 per cent of respondents indicated they had consumed entertainment services during the reference period. This could be attributed to the fact that entertainment is considered a luxury.

5.2 Frequency of Consumption

The trend observed in proportion of consumption of communication services was replicated in the pattern of the frequency of usage during the 12 months reference period (Table 5.2). Nationally, this stood at 8.8 months.

Table 5.2: Average Duration (in Months) for consumption of Services in the last 12 months by Province, Sex, Age and Level of Education

	Household Consumption of the following Services						
Province	Health	Education	Entertain-ment	Transpor-tation	Communi-cation	Other services	Total
Nairobi	3.8	6.2	5.1	10.2	9.8	1.6	1,002,682
Central	3.3	6.5	3.8	8.3	10.1	3.3	1,242,522
Coast	2.9	7.2	2.5	6.1	7.7	0	773,561
Eastern	3.2	6.3	2.3	7.1	7.6	2	947,927
North Eastern	3.6	5.7	2.2	4.3	6.7	1.2	236,775
Nyanza	4.6	6.9	4.2	7.7	8.6	4	1,190,945
Rift Valley	3.5	6.0	2.6	7.7	9.8	5	2,543,120
Western	3	6.4	8	4.1	6.4	1	906,971
Place of Residence							
Rural	3.6	6.5	2.3	6.8	8.3	8	5,750,812
Urban	3.4	6.1	4.5	8.6	9.8	1.1	3,093,692
Sex							
Male	3.5	6.6	3.2	7.6	9.1	1.0	6,268,960
female	3.3	5.9	2.6	6.7	7.9		2,312,118
NS	4.6	7.0	3.3	7.6	10.8	1.0	263,426
Age							
15 - 19 yrs	2.9	5.1	3.6	7.6	7.1	1.5	47,590
20 - 24 yrs	2.8	3.2	4.2	7.2	9.5	6	417,652
25 - 29 yrs	2.9	4.7	3.8	8.6	9.6	4	853,270
30 - 34 yrs	3.8	6.7	3.8	8.1	9.9	9	1,275,144
35 - 39 yrs	3.5	7.2	2.9	7.5	8.8	8	1,083,849
40 - 44 yrs	3.4	7.3	3.3	7.2	8.8	1.2	916,681
45 - 49 yrs	3.3	7.2	2.9	7.9	9.1	1.0	856,485
50 - 54 yrs	3.3	7.2	3.0	7.8	8.5	9	829,426
55 - 59 yrs	3.4	6.3	2.2	6.4	8.1	1.0	524,705
60 - 64 yrs	3.3	5.8	2.3	6.7	8.1	1.0	525,509
65 - 69 yrs	4.4	6.1	2.4	6.9	8.4	9	363,925
70+ yrs	4.1	5.3	2	5.6	6.6	9	886,841

Table 5.2: Average Duration (in Months) for consumption of Services in the last 12 months by Province, Sex, Age and Level of Education

	Household Consumption of the following Services						
Province	Health	Education	Entertain-ment	Transpor-tation	Communi-cation	Other services	Total
Level of Education							
Pre Primary	3.8	6.8	3.6	8.5	9.7	5	42,385
Primary	3.3	6.4	2.5	7.1	8.9	7	3,889,986
Secondary	3.5	6.5	3.5	7.9	9.5	1.4	1,978,136
Higher	4.2	6.8	6.7	10	10.3	1.9	791,486
None	3.6	6	1.7	6.1	6.8	3	1,853,483
Non Standard	2.6	5.6	7.1	7.7	9.5	2.3	12,156
DK	2.6	7.8	3.5	6.6	7.7	2	13,446
NS	4.6	7	3.3	7.6	10.8	1	263,426
Total	**3.5**	**6.4**	**3**	**7.4**	**8.8**	**9**	**8,844,504**

5.3 Average Consumption of Services

For the five major categories of services (health, education, entertainment, transport and communication), the average consumption of services was highest in health which stood at KSh 1,568.5 per household in 12 months. The highest average household expenditure on communication was reported in Nyanza (KSh 1,160.6) while the least (KSh 598.1) was reported in Nairobi Province as shown in Table 5.3. The average consumption of communication services in rural areas was found to be nearly half of the urban setting.

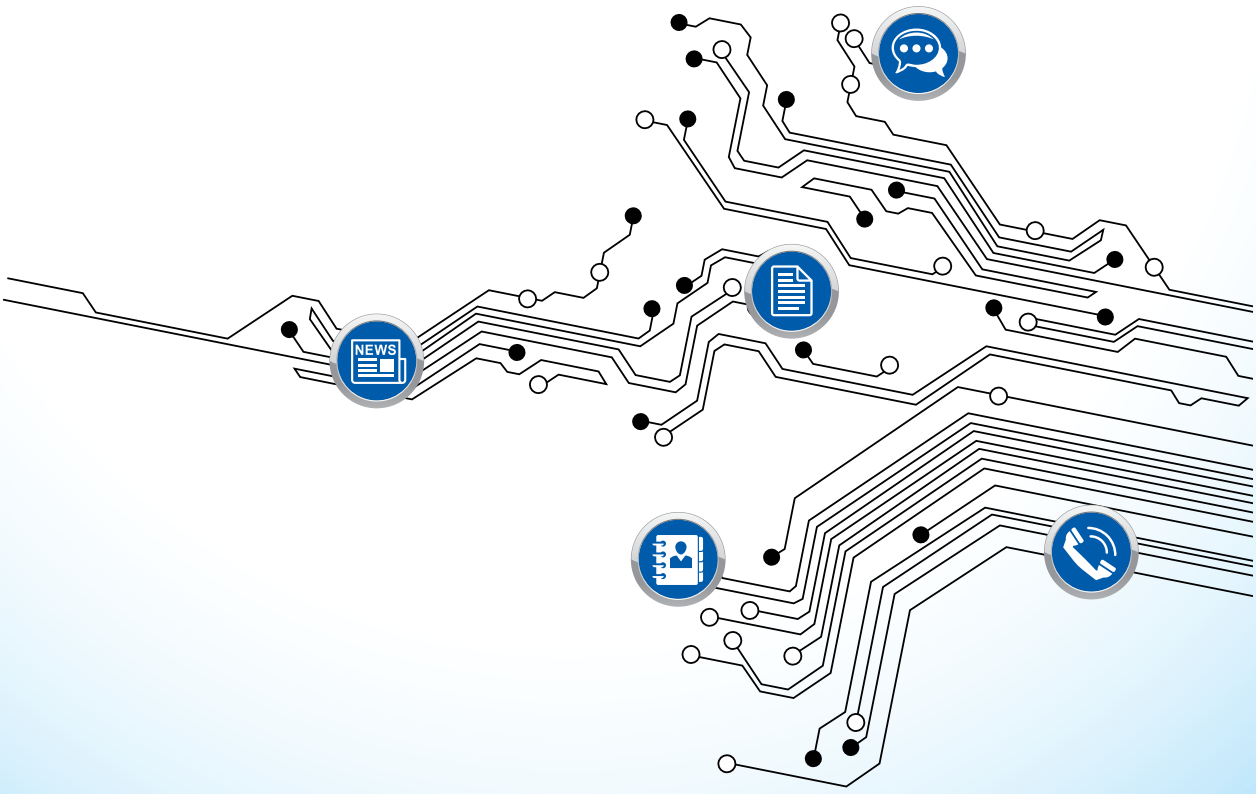


Table 5.3: Average Consumption (in Kshs.) of Services in the last 12 months by Province, Sex, Age and Level of Education

	Household Consumption of the following Services						
Province	Health	Education	Entertain-ment	Transpor-tation	Communi-cation	Other services	Total
Nairobi	5,280.3	1,726.9	8,363.6	2,257.1	598.1	562.4	1,002,682
Central	975.9	89.9	650.6	1,075	1,594.6	541.2	1,242,522
Coast	1,019	198.2	670.1	1,191.1	1,219.2	2.2	773,561
Eastern	924.9	163.1	274.5	614.7	725.3	16.6	947,927
North Eastern	1,459.1	170.4	294.8	1,610.7	1,076.3	353.7	236,775
Nyanza	1,160.6	380.9	478.6	1,452.4	1,729.5	437.9	1,190,945
Rift Valley	1,596	1,303	1,185.9	939.2	979.1	48	2,543,120
Western	938.5	203.8	260.3	487.8	951.4	1	906,971
Place of Residence							
Rural	1,136.7	208.3	582.8	694.9	847.7	118.8	5,750,812
Urban	2,447.9	1,642.1	2,438.7	1,918.4	1,602.9	369.5	3,093,692
Sex							
Male	1,627.7	863.1	1,459.8	1,193.3	1,207.6	225	6,268,960
female	1,543	161.9	495.8	828.8	865	94.3	2,312,118
NS	459.2	141.9	804.6	1,719.3	972.2	15.2	263,426
Age							
15 - 19 yrs	350.7	0	221.1	365.2	504	112.1	47,590
20 - 24 yrs	1,219.4	9,081.8	3,458.9	1,016.5	653.5	38.3	417,652
25 - 29 yrs	1,062.2	41.7	1,782	808.7	794.6	89.1	853,270
30 - 34 yrs	2,185	80.7	1,606.2	1,299.1	1,554.3	159.2	1,275,144
35 - 39 yrs	1,117.3	703.6	859.7	1,449.1	1,375.1	269.1	1,083,849
40 - 44 yrs	1,521.5	342.6	770.3	1,434.1	1,484.3	300.7	916,681
45 - 49 yrs	2,237.6	481.5	1,623.6	1,210	1,263.2	209	856,485
50 - 54 yrs	1,457.9	297.4	1,313.2	1,276.8	912	195.7	829,426
55 - 59 yrs	1,956.6	409.4	838.9	749	1,060.8	331.4	524,705
60 - 64 yrs	1,413.8	570	379.2	942.5	1,029.6	178.8	525,509
65 - 69 yrs	966.2	145.2	540.3	655.7	811.1	119.2	363,925
70+ yrs	1,848	114.5	354.1	567.5	578.9	116.6	886,841

Table 5.3: Average Consumption (in Kshs.) of Services in the last 12 months by Province, Sex, Age and Level of Education (Continued)

	Household Consumption of the following Services						
	Health	Education	Entertain-ment	Transpor-tation	Communi-cation	Other services	Total
Level of Education							
Pre Primary	1,011.1	233	133.6	682.1	719.9	3.4	42,385
Primary	985.8	187	544.5	769.1	918.8	82.7	3,889,986
Secondary	1,099.4	313.9	1,788.5	1,345.9	1,460.9	290.4	1,978,136
Higher	6,893	5,900.6	5,397.2	3,323.5	2,520.1	1,001.6	791,486
None	1,249.2	99.5	294.7	539.9	479.9	50.5	1,853,483
Non Standard	2,218.6	2,768.5	2,294.2	976.8	498.9	0	12,156
DK	559.5	0	438.9	555.4	271.5	29.9	13,446
NS	459.2	141.9	804.6	1,719.3	972.2	15.2	263,426
Total	**1,568.5**	**661**	**1,194.2**	**1,117.4**	**1,115.8**	**187**	**8,844,504**

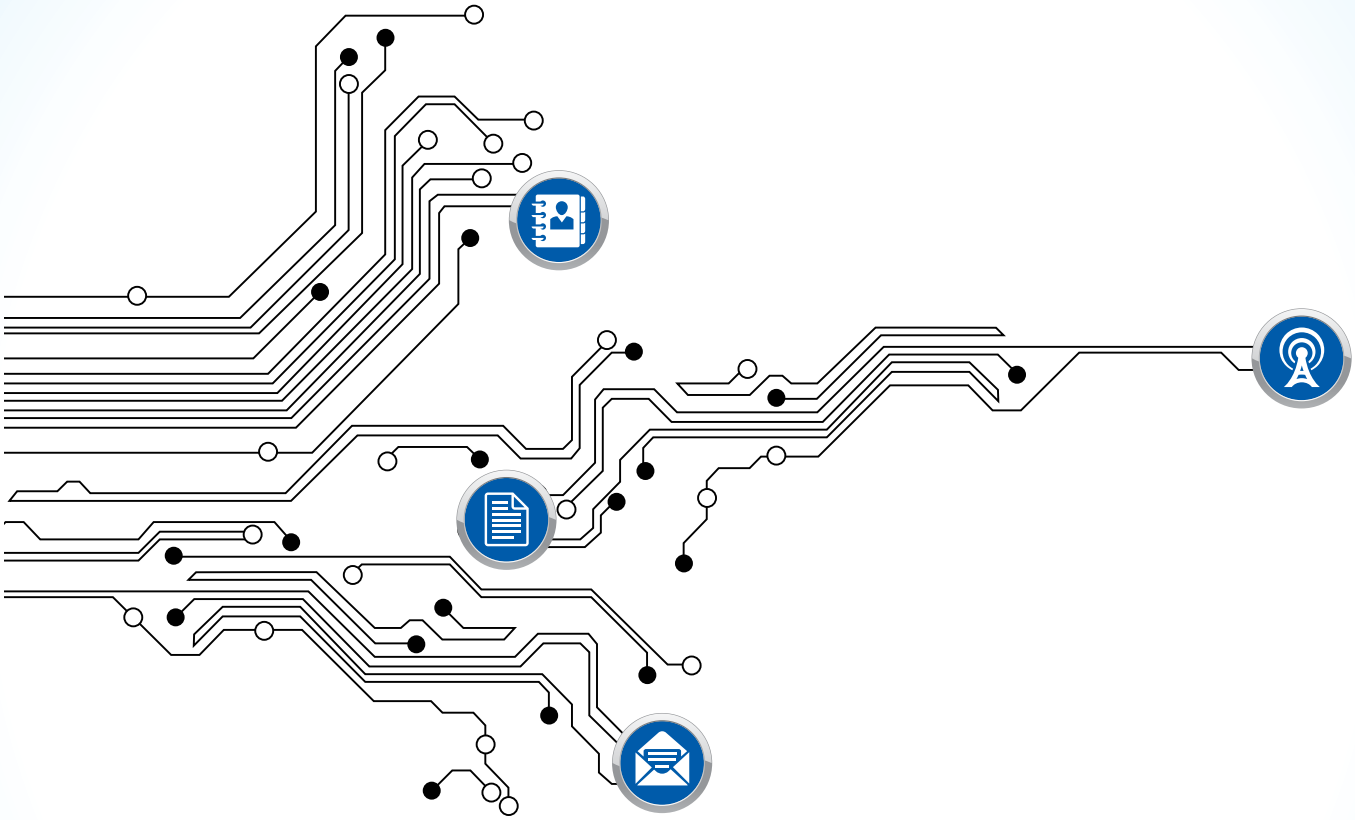
5.4 Conclusion

The survey results reveal that radio is an indispensible tool for delivering development information with about 80 per cent of the households having access to radio as a means of communication. Television sets are not as common in Kenya with 60 per cent of the respondents reporting access to TV. This low access level could be attributed to lack of electricity connections in households which nationally stood at 42.1 percent.

The access and usage of computers and Internet in Kenya was estimated at 8.4 per cent and 6.3 per cent, respectively. These low levels of penetration may be associated with a number of factors, including high cost of computers, poverty levels and lack of electricity connections in the households. These factors are reflected in the trends of access points, where the highest proportion (28.5 per cent) accessed computers through cyber cafés.

Investments and policy objectives in ICT sector have enhanced mobile and Internet access across the country. The study shows that about 60 per cent of the respondents have access to mobile phones. However, only 32.9 per cent of the population owns the device. Ownership of mobile phones was found to vary substantially by the age of the respondent.

Postal service is the oldest mode of communication that is widely spread across the country. Current, 8.9 per cent of the respondents have access to private letter boxes. However, 63.8 per cent of the respondents with access to private letter boxes indicated that they sent no letter. Similarly, 76.9 per cent of the population indicated that they had not received any letter within one month prior to the survey.



SECTION II: ANALYSIS OF THE NATIONAL ICT SURVEY

Introduction

The analytical section of the ICT survey report was compiled by the Apoyo Consultoria, a specialized Information Communications and Technology (ICT) consultancy firm based in Lima, Peru. This section of the report makes detailed analysis of the ICT database collected by the Kenya National Bureau of Statistics (KNBS) in 2010 using a household-based questionnaire. This has been achieved through detailed analysis using both frequency runs and probit regression model on the National ICT Survey data based on economically active population (those aged 18+ years). The household survey collected information from a total of 30,874 individual and 6,803 household observations. The survey was representative at the national and provincial level and by area (urban/rural). At the national level, the survey had a margin of error of 2.5% and a confidence level of 99%.

The analytical component of the report complements Section I of the report which makes descriptive analysis of access and usage of ICT services by province, sex, age, and level of education.

Executive Summary

The analytical report indicates that access to traditional lines is very limited in both urban and rural areas. With the exception of Nairobi (14.1%) and the Coast Province (6.9%), all remaining provinces have a rate of access of less than 5%. The main point of access in Nairobi is peoples´ homes. In all other provinces, the main access points are the office or a payphone. In general, traditional fixed lines are not an important means of access to ICT services in Kenya.

Mobile phone access and ownership are high in Kenya in both urban and rural areas. Even in the province with the lowest access rates (North Eastern), around 60% of the population aged 18 or older has access to a mobile phone (either because they own a mobile phone or because a relative or a friend has one). We established that mobile telephones were a very important way to access ICT services in Kenya. If the mobile sector continues to grow at the current rate, it will help the CCK achieve its goal of closing the voice services gap in the near to mid-term future. To achieve this goal priority should be given to areas with low access particulary the North Eastern Province.

Only a small proportion of the population (5%) needs to travel to access the closest mobile telephone. This is attributed to a high mobile coverage throughout Kenya. However, the proportion of the population that need to travel to access mobile phones spends on average of KES 67 to access the closest telephone. These costs justify the expansion of the services in areas that are currently unserved.

Access to Internet services is limited throughout Kenya and differences in access between rural and urban areas are high. While in most urban areas the rate of access is above 15%, in some rural areas it is less than 3%. Household ownership of Internet connectivity is also limited. This has resorted in cybercafés being the main access points for Internet services. Internet use is high among the people who have access to the service. More than 86% of the people who have access to the Internet report using it. Thus, the main constraint to Internet use seems to be its availability. Email accounts are also limited throughout Kenya.

Compared to mobile users, a high proportion of internet users need to travel to access internet. In addition to the connectivity fee, people who travel spend on average KES 60 on transport. These transportation costs, as in the case of mobiles services, are a reason for the expansion of the services in areas currently not covered. Moreover, the fact that access to Internet is significantly lower than access to mobiles services establishes Internet access as the first priority to reduce ICT gaps.

Access to postal services in Kenya is not as low as Internet or fixed telephone access. In rural areas access rates are in most cases below 20%. Private post office box ownership is also low in Kenya.

There is a very low use of postal services in Kenya. Only 13% of the population has sent a letter in a year. Furthermore, even though businesses and government typically generate 90% of mail in developing countries and send this mail overwhelmingly to individuals, only 17% of individuals in the survey received a letter in a year. The main purpose of sending mail by individuals is to communicate personal news. In addition, only 5% of the population has sent or received a parcel in the last year. The low use of postal services could be influenced by lack of access to post offices as well as the substitutability by other telecommunications services (Internet and mobile phones). Nyanza and Nairobi are the provinces where more people use postal services.

The relatively low level of sending and receiving letters

and parcels by individuals in Kenya is also tied to the low level of activity in mail generating economic sectors such as financial services, advertising, and utilities. In fact, per annual per capita mail usage in Kenya (2.4 pieces) compares favourably with analogous usage levels in other countries within Kenya's GDP per capita range (0.83 pieces). Therefore, it is unlikely that increasing supply of and access to postal services would significantly increase usage of the mail.

Accessibility of post offices in Kenya depends on area of residence (Urban or rural). Though the proportion of people who reported that post offices were hard to reach was relatively small (8%), it seems that urban/ rural and regional differences are important. On average, a car is needed for more than half of the people who declared having access to postal services. Because of the difficulties associated with access, Kenyans hardly visit a post office. Travel to a post office represents a significant investment of time and money (in comparison with the price of the service purchased).

The main way to send and receive letters is by far the PCK, in part due to the monopoly this operator has over the delivery of mail to post office boxes. When asked about other services that people would like PCK to provide, home delivery and money transfer services were indicated as the most desired.

The results of the regression analysis provide an additional criterion for prioritizing the programmes aimed at closing the access gaps. For example, we established that if the CCK financed ICT services in the rural areas of North Eastern and Western provinces it would make an important contribution to increase ICT access in areas where people currently have less probability of access. We found a significant negative relationship between living in rural areas and accessing ICT services. We also found a positive correlation between access to ICT services and its use. This positive correlation shows that investments that increase access will have a positive effect on use.

The absence of direct local access to the service creates higher costs for the population who use ICT services. Usually, the lack of access is prevalent in low-income and rural areas, making poor people pay more for the services than higher-income individuals living in urban areas. We found that travel costs may represent 94% of the cost of making a call from a mobile phone, 50% of the average monthly expenditure on internet services, and 11 times the cost of sending a 20-gram letter.

Regarding the institutions surveyed, we observed that Internet access and connectivity were limited in the Kenyan school system. Less than 45% of schools had access to the service and only 32% had connectivity at the school. Most schools used mobile modems, which have less reliability and low bandwidth, to access the Internet. The main use of Internet services was for communication purposes. We observed that there was still a long way to go in achieving ICT-oriented education throughout the country.

Regarding the identification of access gaps in ICT services, we established that the access gaps in voice services make up for 18% of the villages in Kenya and 10% of the population. We found a positive correlation between access to electricity and access to mobile or fixed telephone services. We also established a positive correlation between availability of voice services and proximity to the closest road.

Access to data services was not as prevalent as access to voice services. For data services, 90% of all villages in Kenya did not have access to Internet (76% of the population). As is the case for voice services, the availability of electricity and roads were important determinants of access to Internet services. There is no village with data services that was more than five kilometres away from a road.

It was also established that big access gaps regarding postal services; 84% of the villagers need to travel to a different village to access services. In addition, more than 80% of the villages with more than 5,000 inhabitants did not have a PCK office in town. There was not a clear relationship between the size of the village in terms of population and the presence of a postal office.

CHAPTER 6: ANALYSIS OF THE ICT SURVEY

6.0 Introduction

The ICT analytical section helps in the understanding of issues related to access, usage, ownership and what influences the usage of various ICT services. The services considered for detailed analysis are voice, data, and postal services. In this section of the report, we describe and analyze the ICT survey on a service-to-service basis.

6.1 Household survey

The household questionnaire collected information for all the household members regardless of their age. However, the analysis was restricted to members who were 18 years or older in order to have in the sample members that access, own, and use telecommunication services independently. We believe that considering members younger than 18 years old would have underestimated access to telecommunications services since their access could be conditioned on the access of older ones. Information about individuals younger than 18 years is in the report prepared by the KNBS on the 2010 ICT Survey.

6.2 Voice services

The 2010 ICT Survey makes it possible to analyse access, use and consumption patterns of traditional fixed and mobile telephones. This section will proceed with this analysis.

6.2.1 Access and Ownership of Traditional Fixed Telephones

Access to traditional fixed lines is low throughout Kenya. Table 6.1 shows that 95% of people do not have access to fixed telephones. In rural areas the percentage of people that have access to fixed telephone services is 2.9%

Table 6.1: Percentage of People with Access to Fixed Telephone by Area

	Rural	Urban	Total
No	97.1%	91.7%	95.3%
Yes	2.9%	8.3%	4.7%
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

As expected, Nairobi had the highest level of access in Kenya. Table 6.1 shows that the access pattern was uniform throughout the country, except for Nairobi and the Coast provinces. In all other provinces fixed telephone access was below 5%.

Table 6.2: Percentage of People with Access to Fixed Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	14.2%	1.9%	6.9%	2.6%	2.1%	3.4%	4.4%	2.0%
Urban	14.2%	2.1%	6.1%	6.1%	9.2%	10.2%	3.8%	6.0%
Rural	-	1.8%	7.4%	1.5%	0.3%	1.2%	4.5%	1.2%

Figures based on sub-population that has access to the service.Source: 2010 ICT Survey

Regarding access to fixed telephones, Table 6.3 shows that in rural areas most people accessed the service at their office or place of work (37%) or at a pay phone (27%) while in urban areas they accessed the service at their office or place of work (31%) or at their homes (42%). These three places concentrated more than 90% of the population's access to fixed telephone at the national level.

Table 6.3: Main Place of Access to Fixed Telephone by Area

	Rural	Urban	Total
Own house	17.8%	41.7%	31.8%
A friend's house	8.2%	2.8%	5.0%
Office/work	36.6%	31.0%	33.3%
PayPhone/Booth	33.6%	23.8%	27.8%
Other	3.8%	0.8%	2.0%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service.Source: 2010 ICT Survey

At the provincial level, Nairobi and the Western had the highest level of access at home. In the Central, Nyanza and Rift Valley provinces access was higher at the office/place of work. In all other provinces, the main point of access was at payphones. As Table 6.4 shows, there were slight differences in the point of access between rural and urban areas. For example, in urban Rift Valley province, the main point of access was the person's own home. In rural areas, on the other hand, it was the office/place of work. A similar situation obtained in the Western Province.

Table 6.4: Main Place of Access to Fixed Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Urban								
Own house	57.8%	0.0%	14.0%	33.3%	0.0%	9.6%	38.7%	54.6%
A friend's house	0.6%	0.0%	6.7%	0.0%	0.0%	0.4%	24.5%	0.0%
Office/work	26.1%	100.0%	31.6%	33.3%	17.7%	46.1%	8.0%	18.2%
PayPhone/Booth	14.7%	0.0%	47.4%	33.3%	49.4%	44.0%	28.3%	27.3%
Other	0.8%	0.0%	0.3%	0.0%	32.9%	0.0%	0.5%	0.0%
Rural								
Own house		36.8%	3.5%	0.0%	0.0%	0.0%	24.3%	34.2%
A friend's house	-	7.1%	0.0%	3.5%	0.0%	20.4%	11.2%	15.1%
Office/work	-	37.5%	0.0%	8.1%	0.0%	38.1%	58.7%	43.2%
PayPhone/Booth	-	18.7%	96.5%	70.8%	100.0%	0.0%	5.3%	7.4%
Other	-	0.0%	0.0%	17.6%	0.0%	41.5%	0.5%	0.0%
Total								
Own house	57.8%	23.6%	6.8%	20.7%	0.0%	7.3%	26.9%	44.2%
A friend's house	0.6%	4.6%	2.1%	1.3%	0.0%	5.1%	13.7%	7.7%
Office/work	26.1%	59.9%	9.9%	23.8%	15.2%	44.2%	49.5%	31.0%
PayPhone/Booth	14.7%	12.0%	81.2%	47.5%	56.5%	33.7%	9.5%	17.2%
Other	0.8%	0.0%	0.1%	6.7%	28.3%	9.8%	0.5%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service.The results of the urban and rural areas of the provinces should be taken as a reference due to their margin of error and confidence intervals (see Appendix I). Source: 2010 ICT Survey

Household ownership of fixed lines was also very limited in Kenya. Only 1.7% of all households in Kenya had a telephone at home. In rural areas, less than one percent of the households had a phone, while in urban areas the percentage was 3.8% (see Table 6.5).

Table 6.5: Percentage of Households that Have a Fixed Telephone by Area

	Rural	Urban	Total
No	99.5%	96.1%	98.3%
Yes	**0.5%**	**3.9%**	**1.7%**
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service.Source: 2010 ICT Survey

As in the case of access, fixed line ownership was concentrated in Nairobi (7%). All other provinces had ownership rates lower than 1.6% as shown in Table 6.6.

Table 6.6: Percentage of Households that Have a Fixed Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of ownership in the province	**7.5%**	**0.5%**	**1.6%**	**0.9%**	**0.4%**	**1.9%**	**0.6%**	**1.1%**
Urban	**7.5%**	**0.1%**	**3.3%**	**1.9%**	**2.0%**	**6.8%**	**1.0%**	**1.6%**
Rural	**0%**	**0.8%**	**0.4%**	**0.5%**	**0.0%**	**0.3%**	**0.5%**	**1.0%**

The results of the urban and rural areas of the provinces should be taken as a reference due to their margin of error and confidence intervals (see Appendix I). Source: 2010 ICT Survey

From the previous analysis, it is evident that access to traditional lines is very limited in both urban and rural areas. With the exception of Nairobi (14.1%) and the Coast Province (6.9%), all remaining provinces had a rate of access of less than 5%. The main point of access in Nairobi was people´s homes. In all other provinces, the main access points were the office or a payphone. In general, traditional fixed lines were not an important means of access to ICT services in Kenya.

6.2.2 Access, Ownership, Usage and Expenditure in Mobile Telephones

Unlike the case of fixed telephone lines, the rate of access to mobile phones was more than 80% in Kenya. As Table 6.7 shows, access to mobile phones was high in urban and rural areas. In urban areas more than 95% of the population had access compared with 79% in rural areas.

Table 6.7: Percentage of People with Access to Mobile Telephone by Area

	Rural	Urban	Total
No	21.2%	5.4%	16.1%
Yes	**78.8%**	**94.6%**	**83.9%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Access to mobile phones was high in all provinces of Kenya (Table 6.8). The lowest access rate (61%) was found in the North Eastern Province, which might be attributed to low population density. Access in all urban areas was above 90%. Access in rural areas was lower but in almost all provinces was higher than 70%. Differences in access to mobile phones between rural and urban areas was large in some provinces. For example, in the Coast Province, access in urban areas was 91% compared with 71% in rural areas.

Table 6.8: Percentage of People with Access to Mobile Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	94.3%	89.4%	78.6%	88.7%	61.1%	85.1%	81.2%	77.3%
Urban	94.3%	91.9%	91.3%	96.6%	93.4%	97.3%	96.5%	96.8%
Rural	-	88.2%	70.7%	86.1%	52.5%	80.9%	78.0%	73.6%

Source: 2010 ICT Survey

Table 6.9 shows that more than half of the population in Kenya had access through their own mobile phone while a quarter used a mobile phone that was available at home. The pattern is quite similar in both rural and urban areas. However in rural areas a higher percentage of population had access through a mobile phone from a friend's house.

Table 6.9 Main Place of Access to Mobile Telephone by Area

	Rural	Urban	Total
Own house	29.6%	21.1%	26.5%
A friend's house	11.9%	3.2%	8.8%
Office/work	0.1%	0.3%	0.2%
PayPhone/Booth	0.9%	0.5%	0.8%
Own mobile	56.6%	74.8%	63.2%
Other	0.9%	0.0%	0.6%
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Table 6.10 shows that at the provincial level the pattern was the same: in both urban and rural areas most people had access to the service because they own a mobile phone. Therefore access and ownership were high throughout Kenya.

Table 6.10: Main Place of Access to Mobile Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Urban								
Own house	17.7%	31.1%	8.9%	14.3%	12.2%	29.9%	26.7%	17.1%
A friend's house	2.4%	3.2%	2.5%	3.1%	12.7%	3.6%	4.2%	3.1%
Office/work	0.0%	0.0%	1.0%	0.0%	0.0%	1.6%	0.2%	0.0%
PayPhone/Simu ya Jamii	1.0%	0.0%	0.4%	0.6%	0.0%	0.3%	0.5%	0.0%
Own mobile	78.9%	65.7%	86.9%	82.0%	75.1%	64.7%	68.4%	79.8%
Other	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%
Rural								
Own house	-	26.9%	24.7%	25.4%	30.2%	28.1%	34.6%	28.7%
A friend's house	-	6.6%	13.7%	17.0%	14.0%	16.0%	10.2%	11.4%
Office/work	-	0.3%	0.2%	0.0%	0.4%	0.0%	0.2%	0.0%
PayPhone/Simu ya Jamii	-	0.4%	1.6%	2.8%	0.1%	1.6%	0.2%	0.1%
Own mobile	-	65.4%	59.1%	54.8%	55.0%	51.7%	54.0%	58.9%
Other	-	0.4%	0.7%	0.0%	0.3%	2.6%	0.8%	0.9%
Total								
Own house	17.7%	28.4%	17.6%	22.7%	24.2%	28.6%	33.0%	26.4%
A friend's house	2.4%	5.5%	8.7%	13.6%	13.6%	12.3%	9.0%	9.7%
Office/work	0.0%	0.2%	0.6%	0.0%	0.3%	0.5%	0.2%	0.0%
PayPhone/Simu ya Jamii	1.0%	0.3%	1.0%	2.3%	0.1%	1.2%	0.3%	0.1%
Own mobile	78.9%	65.5%	71.6%	61.4%	61.7%	55.6%	56.9%	63.1%
Other	0.0%	0.2%	0.5%	0.0%	0.2%	1.8%	0.6%	0.7%

Figures based on sub-population that has access to the service. The results of the urban and rural areas of the provinces should be taken as a reference due to their margin of error and confidence intervals (see Appendix I). Source: 2010 ICT Survey

Mobile ownership at the household level was almost as high as access. Approximately 75% of the households had at least a member who owns a mobile phone. In rural and urban areas, ownership was at 67% and 90% respectively (see Table 6.11).

Table 6.11: Percentage of Households that own a Mobile Telephone by Area

	Rural	Urban	Total
No	33.0%	10.5%	25.1%
Yes	**67.0%**	**89.5%**	**74.9%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

As Table 6.12 shows, more than 80% of urban households in all provinces owned a mobile phone. In rural areas the rate was above 60% except for the North Eastern Province (53%).

Table 6.12: Percentage of Households that own a Mobile Telephone by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of ownership in the province	91.9%	81.1%	74.5%	75.0%	53.0%	63.6%	75.3%	66.4%
Urban	91.9%	87.9%	87.1%	95.6%	84.8%	86.2%	86.1%	91.1%
Rural	-	77.6%	65.4%	66.2%	44.4%	55.9%	72.4%	60.8%

Source: 2010 ICT Survey

According to the ICT Survey, persons aged 18 and above used a mobile phone on average 25 times a week. The average use in urban and rural areas was 32 and 19 times a week respectively. Table 6.13 shows that the higher use in urban areas was found in Nairobi, while the higher use in rural areas was found in the Coast Province. These results suggest a positive relationship between mobile use and wealth.

Table 6.13: Average Number of Times in a Week that a Person uses a Mobile Phone by Area and Province

Province	Rural	Urban	Total
Nairobi	-	37	37
Central	20	36	26
Coast	23	33	28
Eastern	17	28	21
North Eastern	20	32	24
Nyanza	17	32	23
Rift Valley	21	24	22
Western	13	24	16
Total	**19**	**32**	**25**

Figures based on sub-population that has used a mobile phone. Source: 2010 ICT Survey

On average, people in Kenya consumed 50 minutes of outgoing calls in a week (39 minutes in the rural areas and 66 minutes in the urban areas). People in Nairobi made more calls than average (82 minutes a week). A high consumption of minutes was also found in the North Eastern Province. Maybe the longer distances that have to be travelled in North Eastern Province encouraged the consumption of minutes more than in other provinces. Users from the rest of provinces consumed similar amount of minutes.

Table 6.14: Average Minutes Consumed in a Week by Area and Province

Province	Rural	Urban	Total
Nairobi	-	82	82
Central	32	41	35
Coast	50	45	48
Eastern	30	59	40
North Eastern	57	103	73
Nyanza	36	87	54
Rift Valley	44	48	45
Western	35	79	44
Total	**39**	**66**	**50**

Figures based on sub-population that has used a mobile phone. Source: 2010 ICT Survey

Table 6.15 shows that mobile users spent on average KES 242 per week in Kenya. Users from North Eastern Province have the highest expenditure (KES 363) followed by users from Nairobi (KES 349). In urban areas, average expenditure was KES 324 compared with KES 185 in rural areas. The lowest expenditure was found in the Eastern province. Considering the aggregate time of outgoing calls, the implicit tariff per minute is KES 4.8 which was consistent with the tariffs set by the country´s main operators.

Table 6.15: Average Weekly Expenditure in Mobile Phone Calls (KES) by Area and Province

Province	Rural	Urban	Total
Nairobi	-	348.5	348.5
Central	190.3	287.5	225.8
Coast	237.3	327.8	282.1
Eastern	130.6	285.9	184.0
North Eastern	283.3	511.8	362.6
Nyanza	147.8	336.2	216.4
Rift Valley	202.2	306.3	226.0
Western	175.0	284.4	199.2
Total	**185.3**	**324.1**	**242.4**

Figures based on sub-population that has used a mobile phone. Source: 2010 ICT Survey

As it can be seen, mobile phone access and ownership is high in Kenya in both urban and rural areas. Even in the province with the lowest access rates (North Eastern), around 60% of the population aged 18 and above had access to a mobile phone (either because they owned a mobile phone or because a relative or a friend had one). We established that mobile telephones were a very important way to access ICT services in Kenya. If the mobile sector continues to grow at the current rate, it will help the CCK achieve its goal of closing the voice services gap in the near to mid-term future. To achieve this goal priority should be given to areas with low access, particularly the North Eastern Province. On average, Kenyans spent KES 4.8 per minute per outgoing call and made calls for approximately 50 minutes in a week. In total, Kenyans spent around KES 242 per week on phone calls.

6.2.3 Expenditure and additional costs associated with the need of travelling to access telephone services

Table 6.16 shows that about 4.6% of the population aged 18 and above had to travel to another location to use a telephone. In urban areas 3.9% of the population had to travel compared with 5.1% in the rural areas. The low percentage of people that needed to travel in both urban and rural areas shows that most of the populated areas in Kenya are already covered by voice services.

Table 6.16: Percentage of People that Travel to another Location to Use the Telephone by Area

	Rural	Urban	Total
No	95.0%	96.2%	95.4%
Yes	**5.1%**	**3.9%**	**4.6%**
Total	100.0%	100.0%	100.0%

Figures based on sub-population that do not own any type of telephone at home. Source: 2010 ICT Survey

Most people that needed to travel in order to access a telephone went as far as within the village or town . Only in a few cases did people have to leave the village or the ward to access a telephone (Table 6.17).

Table 6.17: Location of Access for People who Travel to another Location to have Telephone Access by Area

	Rural	Urban	Total
Within the village or town	93.9%	86.2%	93.0%
In another village/town of the ward	5.2%	4.7%	5.1%
Outside of the ward but inside the district	0.7%	0.0%	0.6%
Outside of the ward but inside the region	0.0%	9.1%	1.1%
Other region different from own	0.2%	0.0%	0.2%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.18 shows that, on average, people that needed to travel to access a telephone travelled two kilometres. The short distance that had to be travelled to access a telephone was as a result of the high coverage of mobile services in Kenya. The average distance was similar in rural and urban areas.

Table 6.18: Average Distance to the Nearest Telephone (Kilometres) by Area

	Rural	Urban	Total
Average distance	1.99	1.79	1.97

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.19 shows that on average people travelled about 36 minutes (0.6 hours) to get to the closest telephone. Average times were similar for urban and rural areas.

Table 6.19: Average Time to the Nearest Telephone (Hours) by Area

	Rural	Urban	Total
Average travel time	0.61	0.66	0.62

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.20: Means of Transportation of People who Travel to another Location for Telephone Access by Area

Means of transportation	Rural	Urban	Total
Walking	96.4%	95.5%	96.3%
Motorized public transportation	3.1%	4.5%	3.3%
Motorized private transportation	0.3%	0.0%	0.3%
Non motorized public transportation	0.2%	0.0%	0.2%
Total	100%	100%	100%

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.21 shows that on average, Kenyans who needed to travel to access a telephone spent KES 67 on transport. There was a significant difference between the cost that urban and rural people paid: Those living in urban areas paid KES 26, compared with more than KES 85 for their rural counterparts.

Table 6.21: Average Transportation Expenditure to get Telephone Access (KES) by Area

	Rural	Urban	Total
Mean expenditure	85.93	26.79	67.26

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Only a small proportion of the population (5%) needed to travel to access the closest mobile telephone (most of them lived in rural areas). This is attributed to the high mobile coverage throughout Kenya. However, the proportion of the population that needed to travel to access mobile phones spent on average KES 67 in transportation to access the closest telephone. These transportation costs justify the expansion of the services in areas that are currently not unserved.

6.3 Data services

The 2010 ICT Survey makes it possible to analyse access, use and consumption patterns of Internet services by individuals and households in Kenya. This section will proceed with this analysis.

6.3.1 Access, ownership, usage and expenditure in Internet services

Table 6.22 shows that only 13% of the population of Kenya had access to Internet. Access was found to be much higher in urban areas. In rural areas, only 7% of the population has access to Internet.

Table 6.22: Percentage of People with Access to Internet by Area

	Rural	Urban	Total
No	93.5%	74.3%	87.4%
Yes	**6.5%**	**25.7%**	**12.6%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Table 6.23 shows that Nairobi Province had the highest rate of Internet access, followed by Coast, Nyanza and Central Provinces (with more than 10%). With the exception of the Western Province, more than 15% of the population living in urban areas had access to the service. In rural areas, the highest access to Internet was found in Central, Coast, and Rift Valley Provinces (more than 8%). Differences were found to be large between urban and rural access within provinces.

Table 6.23: Percentage of People with Access to Internet by Area and Province

	Nairobi	Central	Coast	Eastern	North	Nyanza	Rift	Western
% of access in the province	38.2%	11.3%	12.7%	8.2%	7.4%	11.8%	9.9%	3.0%
Urban	38.2%	15.5%	18.6%	23.3%	26.3%	31.6%	17.1%	7.3%
Rural	-	9.3%	8.8%	3.5%	2.5%	5.1%	8.4%	2.1%

Source: 2010 ICT Survey

Most Kenyans accessed the Internet at Internet cafés (38%). Others had access of the service at their workplace (21%), home (17%) or via a mobile phone (16%). Table 6.24 shows that the places of access were similar between urban and rural areas.

Table 6.24: Main Place of Access to the Internet by Area

	Rural	Urban	Total
Own house	10.4%	19.8%	16.7%
A friend's house	3.5%	1.1%	1.9%
Office/work	15.8%	22.8%	20.5%
Cybercafe	39.4%	36.9%	37.7%
Community centre	2.7%	0.9%	1.5%
Educational centre	5.8%	3.5%	4.3%
Mobile phone	19.9%	14.7%	16.4%
Others	2.4%	0.3%	1.0%
Total	**100.0%**	**100.0%**	**100.0%**

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.25 shows that cybercafés were the main point of access to Internet in most provinces, both at the rural and urban levels. Exceptions to this were North Eastern and Central provinces, where the mobile phone and work place were the main access point, respectively.

Table 6.25: Main Place of Access to Internet by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Urban								
Own house	27.5%	20.9%	17.7%	2.6%	0.0%	9.7%	12.0%	0.0%
A friend's house	1.2%	1.6%	0.0%	0.0%	0.0%	0.0%	4.3%	0.0%
Office/work	21.1%	34.1%	12.2%	18.3%	12.0%	35.3%	18.7%	26.5%
Cybercafe	30.3%	21.0%	50.6%	67.3%	21.7%	40.5%	48.8%	45.7%
Community centre	0.3%	1.3%	1.9%	0.0%	0.0%	2.3%	2.7%	0.0%
Educational centre	2.4%	13.6%	1.3%	2.6%	3.6%	1.9%	6.6%	0.0%
Mobile phone	16.8%	7.5%	16.3%	9.2%	62.7%	10.3%	6.9%	20.6%
Others	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	7.2%
Rural								
Own house	-	18.7%	3.6%	6.7%	0.0%	10.6%	7.6%	25.7%
A friend's house	-	6.5%	1.4%	0.6%	0.0%	3.3%	3.5%	0.0%
Office/work	-	14.2%	1.4%	21.2%	0.0%	9.8%	20.3%	19.9%
Cybercafe	-	20.9%	89.9%	30.4%	31.9%	29.4%	40.4%	29.1%
Community centre	-	4.0%	0.0%	4.7%	0.0%	10.0%	1.0%	3.2%
Educational centre	-	10.0%	2.0%	10.1%	15.3%	11.7%	3.4%	0.0%
Mobile phone	-	20.6%	1.6%	26.4%	52.8%	20.1%	22.1%	22.1%
Others	-	5.2%	0.0%	0.0%	0.0%	5.2%	1.6%	0.0%
Total								
Own house	27.5%	19.7%	12.1%	3.8%	0.0%	9.9%	8.7%	14.3%
A friend's house	1.2%	4.3%	0.6%	0.2%	0.0%	0.9%	3.7%	0.0%
Office/work	21.1%	23.0%	7.9%	19.1%	10.2%	28.3%	19.9%	22.8%
Cybercafe	30.3%	20.9%	66.2%	56.8%	23.3%	37.5%	42.3%	36.5%
Community centre	0.3%	2.8%	1.1%	1.3%	0.0%	4.4%	1.4%	1.8%
Educational centre	2.4%	11.6%	1.6%	4.7%	5.5%	4.6%	4.2%	0.0%
Mobile phone	16.8%	14.8%	10.5%	14.1%	61.1%	13.0%	18.5%	21.4%
Others	0.3%	2.9%	0.0%	0.0%	0.0%	1.4%	1.2%	3.2%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

With regard to ownership, Table 6.26 shows that only 6% of all households were connected to internet at home. In urban areas, this number rose to 13% compared with 3% in rural areas.

Table 6.26: Percentage of Households owning Internet Connection by Area

	Rural	Urban	Total
No	97.1%	87.4%	93.7%
Yes	**2.9%**	**12.6%**	**6.3%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Table 6.27 shows that besides Nairobi and the urban areas of Nyanza, Internet connectivity was very low throughout Kenya. Connectivity was more common in urban areas, except for the Rift Valley and Central provinces. The lowest Internet connectivity was in the rural areas of the North Eastern and Coast provinces.

Table 6.27: Percentage of Households owning Internet Connection by Area and Province

	Nairobi	Central	Coast	Eastern	North	Nyanza	Rift	Western
% of ownership in the province	27.2%	3.7%	3.8%	1.7%	1.1%	5.3%	4.4%	1.6%
Urban	27.2%	2.7%	8.5%	3.1%	5.3%	15.0%	2.5%	3.6%
Rural	-	4.3%	0.4%	1.0%	0.0%	2.0%	4.8%	1.2%

Source: 2010 ICT Survey

Table 6.28 shows that 86% of the people who had access to Internet had used it in the past year. In urban areas the rate of usage was 92%, compared with 73% in rural areas. We established that most people that had access to internet used it. This finding suggests that the main factor that hinders Internet use is the lack of access to the service (i.e. connectivity).

Table 6.28: Percentage of People that have engaged in Internet Activity in the last 12 Months by Area

	Rural	Urban	Total
No	26.6%	8.0%	14.5%
Yes	73.4%	92.1%	85.5%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

In almost all provinces, people that had access to Internet used it as shown in Table 6.29. For example in Nairobi and other urban areas (Central, Nyanza, and Western) usage rates were either near or over 90%. In almost all rural areas, more than 60% of the population with access to Internet used it (the only exception was the rural areas of the Coast Province). In all urban areas, more than 80% of the population with Internet access used it. These findings further corroborate that access was the main constraint on the use of the Internet.

Table 6.29: Percentage of People that have engaged in Internet Activity in the last 12 Months, by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	93.2%	89.2%	51.8%	78.2%	94.4%	87.0%	87.3%	88.4%
Urban	93.2%	94.7%	81.6%	85.5%	91.8%	97.5%	90.0%	100.0%
Rural	-	84.7%	15.0%	62.8%	100.0%	65.1%	86.2%	80.5%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Moreover, Table 6.30 reveals that Internet was used quite frequently, with 50% of the people utilising it on a daily basis. As usual, people living in urban zones used Internet more often than those living in rural areas.

Table 6.30: Frequency of Internet Usage by Area

	Rural	Urban	Total
Once a day	35.8%	59.3%	52.3%
Once a week	30.8%	26.9%	28.1%
Once a month	28.8%	7.3%	13.7%
Once 3 months	1.9%	1.8%	1.8%
Once 6 months	1.1%	1.7%	1.5%
Once a year	1.7%	3.0%	2.6%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has used the service. Source: 2010 ICT Survey

At the province level, Nairobi, Nyanza and Western had the most frequent users (Table 6.31). The Eastern Province, where access was the lowest in Kenya, had the most sporadic users.

Table 6.31: Frequency of Internet Usage by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Once a day	67.5%	54.7%	41.8%	6.5%	30.4%	65.4%	37.7%	68.0%
Once a week	23.8%	32.3%	40.0%	47.0%	28.4%	24.3%	25.3%	30.0%
Once a month	5.5%	9.6%	12.6%	17.5%	37.6%	5.2%	31.4%	1.9%
Once 3 months	0.1%	1.2%	5.4%	13.1%	2.0%	2.2%	0.5%	0.0%
Once 6 months	1.8%	0.3%	0.1%	7.2%	0.0%	1.5%	0.4%	0.0%
Once a year	1.3%	1.8%	0.1%	8.7%	1.6%	1.4%	4.8%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has used the service. Source: 2010 ICT Survey

Table 6.32 presents the average weekly expenditure on Internet connectivity. On average, Kenyans spent KES 750 per month on Internet connectivity. In urban areas average expenditure was KES 904, compared with KES 476 in rural areas. Nairobi and Nyanza had higher average expenditure while the Eastern Province had the lowest.

Table 6.32: Average Monthly Expenditure on Internet Connectivity (KES) by Area and Province

Province	Rural	Urban	Total
Nairobi	-	1 058	1 058
Central	751	713	736
Coast	200	421	418
Eastern	141	142	142
North Eastern	423	387	392
Nyanza	735	1 116	1 016
Rift Valley	357	537	395
Western	530	876	655
Total	476	904	750

Figures based on sub-population that has used the service. Source: 2010 ICT Survey

Table 6.33 presents the purposes and activities of Internet use in Kenya. The main purposes for using internet are: private use, entertainment, and work. We also found that the internet was mainly used for communication activities. This finding suggests that internet was perceived as an important tool for reducing communication gaps. In addition, Internet was used for research. The results in Table 6.33 are found to be consistent between urban and rural areas.

Table 6.33a: Purposes and Activities of Internet Use by Area

	Rural	Urban	Total
Private use	76.6%	81.8%	80.2%
Own business	8.5%	15.7%	13.5%
Work	23.5%	37.9%	33.6%
Entertainment	43.5%	44.7%	44.4%
Health	3.4%	4.5%	4.2%
Other	9.4%	11.3%	10.7%

Table 6.33b: Activities

	Rural	Urban	Total
Communicating(Email/Internet phone)	79.3%	91.8%	88.1%
Getting information about good and services	11.0%	22.2%	19.0%
Getting information from government organisations, public authorities via websites or email	16.0%	19.1%	18.2%
Reading/Downloading electronic books, newspaper or magazine	19.6%	19.8%	19.7%
Playing/Downloading computer games	24.2%	15.8%	18.3%
Watching movies/TV	13.6%	14.5%	14.2%
Getting information related to health or health services	6.6%	9.0%	8.3%
Purchasing or ordering goods or services	1.4%	9.2%	6.9%
Internet banking	1.5%	4.0%	3.2%
Research	27.6%	35.5%	33.2%
Other	0.9%	4.3%	3.3%

Figures based on sub-population that has used the service. Source: 2010 ICT Survey

Table 6.34 displays the possession of email accounts in Kenya which can be used as a proxy for internet access. We established that the percentage of people with email address in Kenya was low (around 10%). The highest proportion was found in urban areas.

Table 6.34: Individual Email Account Possession by Area

	Rural	Urban	Total
No	95.8%	78.7%	90.4%
Yes	**4.2%**	**21.3%**	**9.6%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Access to Internet services was limited throughout Kenya and differences in access between rural and urban areas were high. While in most urban areas the rate of access was above 15%, in some rural areas it was less than 3%. Household ownership of Internet connectivity was also limited. As a result of the foregoing, cybercafés were key access points for the Internet. Internet use was high among the people who had access to internet, with more than 86% of the people who had access, report using it. This holds for both rural and urban areas in almost all provinces. Thus, the main constraint on Internet use seems to be its availability. Email accounts were found to be limited throughout Kenya.

6.3.2 Expenditure and additional costs associated with the need of travelling to access Internet services

Table 6.35 shows that about 35% of the population had to travel to another location to use Internet. In urban areas, 39% of Internet users travelled to access services compared to 27% in rural areas. The high percentage of people that needed to travel to use Internet is attributed to of the low penetration of Internet services.

Table 6.35: Percentage of People that Travel to another Location to Access Internet by Area

	Rural	Urban	Total
No	73.5%	60.8%	64.7%
Yes	**26.5%**	**39.2%**	**35.3%**
Total	100.0%	100.0%	100.0%

Figures based on sub-population that do not have internet connectivity in the household. Source: 2010 ICT Survey

Almost 50% of the people who travelled to access Internet services did so within the village or town. However, we established a significant proportion of people that had to travel to another village or town in order to access the internet (Table 6.36).

Table 6.36: Location of Access for People who Travel to Access Internet by Area

	Rural	Urban	Total
Within the village or town	36%	55%	50%
In another village/town of the ward	27%	43%	39%
Outside of the ward but inside the district	32%	1%	8%
Outside of the ward but inside the region	5%	1%	2%
Other region different from own	0%	0%	0%
Total	100%	100%	100%

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

On average, Kenyans travelled 2.7 kilometres to access Internet, which is longer than the distance travelled to access a mobile phone. The average distance was similar in rural and urban areas (see Table 6.37).

Table 6.37: Average Distance to the Nearest Internet Access Point (Kilometres) by Area

Province	Rural	Urban	Total
Mean distance	3.0	2.7	2.7

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.38 shows that Kenyans travelled, on average, 36 minutes (0.6 hours) to get to the closest Internet connection, similar to the mean travel time to access a mobile phone. There was an important difference in travel time between urban and rural areas: people living in urban areas travelled for about 30 minutes while people in rural areas travelled almost an hour. The longer travel time in rural areas compared to urban areas was probably the reason behind the difference in access to internet between these areas.

Table 6.38: Average Time to Nearest Internet Access Point (Hours) by Area

Province	Rural	Urban	Total
Mean travel time	0.95	0.49	0.60

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Walking and motorized public transportations were the most common transportation means for Internet access (see Table 6.39). Unlike rural areas, where almost 70% had to use some means of transportation to access Internet, in urban areas there was a larger population that only had to walk (48%).

Table 6.39: Means of Transportation of People who Travel to Another Location for Internet Access by Area

	Rural	Urban	Total
Walking	29.0%	47.5%	42.4%
Motorized public transportation	63.8%	41.4%	47.6%
Motorizes private transportation	5.8%	7.8%	7.3%
Non motorized public transportation	0.0%	3.1%	2.3%
Non motorized private transportation	1.4%	0.1%	0.5%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Table 6.40 shows that, on average, Kenyans who needed to travel to access Internet spent KES 60 on transport. There was a significant difference between the cost that urban and rural people paid: people living in urban areas spent KES 41, compared to more than KES 100 paid by their rural counterparts.

Table 6.40: Average Transportation Expenditure to get Internet Access (KES) by Area and Province

Province	Rural	Urban	Total
Mean expenditure	100.0	41.4	59.1

Figures based on sub-population that needs to travel to another location to use the service. Source: 2010 ICT Survey

Compared to mobile users, a high proportion of internet users needed to travel to access the service. In addition to the connectivity fee, people who had to travel to access the service spent on average KES 60 on transport costs.As a result, users in rural areas paid as high as KES 100, which represents almost 21% of the internet expenditure in rural areas. These transportation costs, as in the case of mobile services, are a reason for the expansion of the services in areas currently not covered. Moreover, the fact that access to internet was significantly lower than access to mobile services, establishes internet access as the first priority to reduce ICT gaps.

6.4 Postal services

The 2010 ICT Survey makes it possible to analyse access, use and consumption patterns of postal services by individuals and households in Kenya. This section will proceed with this analysis.

6.4.1 Access, ownership and usage of postal services

Table 6.41 shows that 23% of the population aged 18 or older had access to postal services (has a private post office box and has received a letter or has sent a letter or parcel from a post office). In urban areas 35% of the population had access to postal services compared to 18% in rural areas.

Table 6.41: Percentage of People with Access to Postal Services by Area

	Rural	Urban	Total
No	82.0%	65.1%	76.7%
Yes	**18.0%**	**34.9%**	**23.3%**
Total	100.0%	100.0%	100.0%

Source: 2010 ICT Survey

Access to postal service varied between provinces and between urban and rural areas. Nairobi and Central provinces were found to have the highest access to postal services. The urban areas of Nyanza were found to have the highest access to postal service (54%) while the rural areas of North Eastern province have the lowest access (9%). There is a significant difference between the access to postal services in rural and urban areas within the same province (Table 6.42).

Table 6.42: Percentage of People with Access to Postal Services by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	36.1%	34.1%	23.0%	16.9%	15.0%	25.8%	18.4%	16.3%
Urban	36.1%	35.8%	35.9%	33.5%	39.9%	54.4%	22.5%	24.8%
Rural	-	33.3%	15.2%	12.1%	9.2%	16.3%	17.5%	14.6%

Source: 2010 ICT Survey

Table 6.43 reveals that 15% of the households had access to postal delivery services (meaning ownership of a private post office box). In rural areas, access was 11% compared to 26% in urban areas.

Table 6.43: Percentage of Households that own a Post Office Box by Area

	Rural	Urban	Total
No	89.2%	74.4%	84.6%
Yes	**10.8%**	**25.6%**	**15.4%**
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

We established a wide variation in the level of access to postal services among provinces and areas. For instance, access to postal services in the urban areas of North Eastern Province was recorded at 44% compared to 7% in the urban areas of Eastern Province. Similarly while the urban areas of the North Eastern Province have a 44% access to postal services, the rural areas of the same region had only 8% access.

Table 6.44: Percentage of Households that own a Mailbox by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of ownership in the province	32.6%	22.9%	19.5%	4.9%	15.4%	15.4%	9.8%	12.1%
Urban	32.6%	23.9%	30.1%	7.4%	44.4%	31.9%	15.6%	17.4%
Rural	-	22.5%	12.5%	4.2%	8.5%	10.0%	8.6%	11.1%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Access to postal services in Kenya was not as low as Internet or fixed telephone access. In rural areas, access rates were in most cases below 20% (in urban areas access rates were about 30%). Private post office box ownership was low in Kenya; only 15% of the households had one. In most rural areas, the proportion of households owning postal office boxes was as low as 10%. Nairobi and Central provinces registered the highest access and ownership rates while Eastern Province had the lowest. It should be noted that the 15% ownership rate for post office boxes may include different individuals, or even different families and businesses that shared the same box.

The level of use of postal services in Kenya represents letters and parcels sent and received. Table 6.45 presents the number of letters sent by the population aged 18 or older. More than 88% of the population did not send any letter for over a year, and only 11% of the population sent between one and ten letters. Only 1% of the population sent more than 10 letters.

Table 6.45: Number of Letters Sent by Area

	Rural	Urban	Total
None	90.3%	80.4%	87.2%
1 to 10	8.7%	17.3%	11.4%
11 to 20	0.7%	1.5%	1.0%
More than 20	0.3%	0.8%	0.5%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

The situation was similar in both urban and rural areas but with a higher number of people having sent at least one letter in urban areas. Nairobi and Nyanza were the provinces where people sent more letters (Table 6.46).

Table 6.46: Number of Letters Sent by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
None	82.4%	91.1%	87.4%	86.3%	88.8%	82.7%	87.6%	91.3%
1 to 10	14.9%	7.4%	10.9%	13.5%	9.9%	15.2%	11.0%	8.1%
11 to 20	1.3%	0.9%	1.1%	0.2%	0.7%	1.6%	1.1%	0.7%
More than 20	1.3%	0.6%	0.6%	0.1%	0.5%	0.6%	0.3%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 6.47: Main Reason of Sending Letters by Area

	Rural	Urban	Total
Sharing personal news and information	72.7%	77.0%	74.7%
Paying bills	20.0%	36.0%	27.6%
Communicating with financial institutions	18.3%	18.4%	18.3%
Ordering goods and services	2.9%	7.7%	5.2%
Dealing (interacting) with government organisation organizations/public authorities	22.9%	19.8%	21.4%

Tables based on sub-population that reported sending at least one letter. Source: 2010 ICT Survey

Table 6.47 reveals that communicating personal issues was the most common purpose for sending letters. A smaller proportion of people sent letters to pay bills (28%) and to deal with government affairs (21%) or financial institutions (18%). Except for paying bills, where the urban rate was higher, differences of purposes between the two areas were minor.

Table 6.48: Main Reason of Sending Letters by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Sharing personal news and information	66.4%	71.7%	64.7%	83.4%	89.7%	80.1%	71.1%	84.1%
Paying bills	36.9%	40.4%	15.8%	26.1%	19.3%	31.3%	22.7%	17.1%
Communicating with financial institutions	23.3%	25.6%	8.7%	8.8%	12.9%	12.6%	25.3%	15.4%
Ordering goods and services	13.2%	2.7%	6.7%	0.9%	11.0%	2.3%	4.8%	4.2%
Dealing(interacting) with government organisation organizations/public authorities	22.0%	15.7%	11.5%	19.3%	25.8%	15.6%	28.6%	27.7%

Figures based on sub-population that reported sending at least one letter. Source: 2010 ICT Survey

Regional differences in the purposes of sending letters are worth mentioning. In areas where access was found low, the dominant purpose of sent letters was sharing personal news or information. The widespread use of letters for this purpose might be related to the low Internet accessibility, since this kind of letters could be easily replaced by emails. It may also reflect lower levels of business activity. This is presented in Table 6.48.

Table 6.49: Number of Parcels Sent by Area

	Rural	Urban	Total
None	97.3%	92.2%	95.7%
1 to 10	2.4%	6.9%	3.8%
11 to 20	0.2%	0.5%	0.3%
More than 20	0.1%	0.4%	0.2%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.50: Number of Parcels Sent by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
None	92.8%	97.0%	95.5%	97.1%	94.9%	89.5%	97.7%	98.2%
1 to 10	6.6%	2.7%	4.2%	2.9%	4.8%	9.0%	2.1%	1.5%
11 to 20	0.4%	0.3%	0.2%	0.1%	0.1%	1.0%	0.0%	0.1%
More than 20	0.3%	0.0%	0.1%	0.0%	0.3%	0.5%	0.2%	0.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.49 and 6.50 shows that less than 5% of the population has sent a parcel 12 months prior to the survey. In urban areas this rate reached 8% of the population compared to 3% in rural areas. Nairobi and Nyanza were the provinces where most people sent parcels.

Table 6.51 shows that around 85% of the population aged 18 and above did not receive any letter 12 months prior to the survey. Only 13% of the population received between one and ten letters and only 3% received more than 10 letters. We established that the percentage of people that received letters was higher in urban areas compared to rural areas. Analysis of the number of letters received by province we established that Nairobi province was where most people received letters (Table 6.52).

Table 6.51: Number of Letters Received by Area

	Rural	Urban	Total
None	87.8%	73.7%	83.3%
1 to 10	9.8%	18.7%	12.6%
11 to 20	1.8%	4.3%	2.6%
More than 20	0.7%	3.3%	1.5%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.52: Number of Letters Received by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
None	73.9%	81.4%	82.0%	85.2%	88.3%	82.3%	85.0%	90.0%
1 to 10	17.5%	12.4%	13.2%	13.4%	10.0%	15.3%	10.7%	8.7%
11 to 20	4.5%	3.3%	2.7%	1.1%	0.9%	1.7%	3.2%	1.2%
More than 20	4.1%	2.9%	2.1%	0.3%	0.8%	0.8%	1.1%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.53: Main Purpose of Receiving Letters by Area

	Rural	Urban	Total
Family/other information	62.9%	59.8%	61.3%
Bills	28.0%	61.5%	44.7%
Bank/credit card statements	24.2%	28.5%	26.3%
Advertisements	6.1%	11.1%	8.6%
Dealing(interacting) with government	20.7%	15.4%	18.1%

Figures based on sub-population that reported receiving at least one letter. Source: 2010 ICT Survey

Table 6.54: Main Purpose of Receiving Letters by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Family/other information	57.0%	53.3%	51.1%	74.4%	89.1%	72.6%	57.4%	64.8%
Bills	69.7%	56.8%	32.5%	25.5%	26.2%	42.0%	37.4%	31.9%
Bank/credit card statements	44.6%	33.8%	9.8%	8.2%	10.0%	19.0%	28.8%	19.9%
Advertisements	10.6%	4.1%	2.2%	0.6%	2.0%	23.9%	8.6%	6.3%
Dealing (interacting) with government organizations/public authorities	20.9%	8.8%	6.5%	17.6%	23.0%	15.5%	25.4%	24.7%

Figures based on sub-population that reported receiving at least one letter. Source: 2010 ICT Survey

Receiving family information was the most common purpose of received letters (Table 6.53). Receiving bills was much more common for people living in urban areas (62%) compared to rural ones (28%). This was influenced by the presence of utilities in urban areas rather than rural areas. Bank statements were sent only to the 26% of the people who claimed receiving at least one letter. Table 6.54 indicates slight differences between provinces on the dominant purpose for receiving letters.

Table 6.55: Number of Parcels Received by Area

	Rural	Urban	Total
None	96.9%	91.6%	95.2%
1 to 10	2.9%	7.3%	4.3%
11 to 20	0.1%	0.7%	0.3%
More than 20	0.1%	0.4%	0.2%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Table 6.56: Number of Parcels Received by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
None	91.7%	97.3%	95.2%	97.1%	94.9%	90.2%	96.0%	97.8%
1 to 10	7.4%	2.6%	4.0%	2.8%	4.6%	8.6%	3.7%	1.8%
11 to 20	0.6%	0.1%	0.7%	0.1%	0.2%	1.0%	0.1%	0.2%
More than 20	0.4%	0.1%	0.1%	0.0%	0.4%	0.3%	0.2%	0.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

As in the case of sent parcels, less than 5% of the population (8% in urban areas) had received a parcel within the year (see Table 6.55). Differences across regions were not very large. Nairobi and Nyanza were the provinces where most people had received at least a parcel (Table 6.56). Sending and receiving parcels was not common in Kenya during the survey period.

There was a very low use of postal services in Kenya. Only 12% of the populationhad sent a letter a year prior to the survey. Furthermore, even though businesses and government typically generate 90% of mail in developing countries and send this mail overwhelmingly to individuals, only 14% of individuals in the survey had received a letter in a year. The main purpose of sending or receiving mail by individuals was to communicate personal news. In addition, only 4% of the population had sent or received a parcel in the previous year. The low use of postal services may have been influenced by lack of access to post offices as well as the substitutability by other telecommunications services (Internet and mobile phones). Mobile phones, for example, have wider service coverage and are relatively cheaper and much faster in sending information than regular mail. Furthermore, services like money transfer services had started to provide alternatives to the traditional, postal-based financial activities such as mailed financial statements and perhaps even bills and bill payment.

However, the relatively low level of sending and receiving letters and parcels by individuals in Kenya was most likely tied to the low level of activity in mail generating economic sectors such as financial services, advertising, and utilities. In fact, annual per capita mail usage in Kenya (2.4 pieces) compared favourably with analogous usage levels in other countries within Kenya's GDP per capita range (0.83 pieces). Therefore, it is unlikely that increasing supply of and access to postal services would significantly increase usage of the mail except in areas where there is a specific demand for services. Probably, where mail usage was high individuals had fewer communications options and more non-business reasons for communicating.

Table 6.57: Accessibility to Post Offices by Area

	Rural	Urban	Total
Within walking distance	25.4%	50.4%	34.1%
Reachable by car	63.4%	47.0%	57.6%
Hard to reach	11.3%	2.7%	8.3%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

Accessibility of post offices in Kenya depended on the area of residence, as is presented in Table 6.57 and Table 6.58. Though the proportion of people who declared that post offices were hard to reach was relatively small (8%), it seems that urban/rural and regional differences were important. On average, a car was needed for more than half of the people reported as having access to postal services. Nevertheless, the relatively small number of individual mailers who considered post offices hard to reach reflects the low level of mail generated and received by these individuals compared to businesses and government. Only in North Eastern Province did the majority of respondents

Table 6.58: Accessibility to Post Offices by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Within walking distance	25.5%	41.8%	36.0%	41.4%	21.6%	39.9%	21.2%	36.0%
Reachable by car	69.9%	56.7%	52.7%	55.8%	23.7%	51.1%	66.5%	57.0%
Hard to reach	4.6%	1.5%	11.4%	2.8%	54.7%	9.0%	12.3%	7.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

(55%) consider post offices hard to reach and this was most likely due to both the scarcity of offices and the demand generated by the refugee camp. In no other province did more than 12% of individuals consider post offices hard to reach.

Table 6.59: Frequency of Visits to Post Offices by Area

	Rural	Urban	Total
At least once a day	0.5%	2.9%	1.3%
At least once a week	2.6%	7.3%	4.2%
At least once a month	6.6%	16.4%	10.0%
Once every 3 months	2.7%	4.6%	3.4%
Once every six months	1.5%	2.8%	1.9%
Once every year	1.6%	2.3%	1.8%
Never	84.5%	63.7%	77.3%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that reported sending or receiving a letter or parcel. Source: 2010 ICT Survey

Related to accessibility, Table 6.59 presents the frequency of visits to post offices. Most people indicated that they had not visited post offices at all (77%), especially in rural Kenya (85%). Most people that visited post offices had done so once a month or every three months (13%). As is the trend in the in most post -related statistics, rural and urban areas had the most evident differences compared with other ICT services.

Table 6.60: Frequency of Visits to Post Offices by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
At least once a day	1.8%	0.5%	3.1%	0.5%	0.0%	3.7%	0.7%	1.3%
At least once a week	9.1%	2.6%	3.7%	3.1%	0.6%	4.8%	5.6%	4.2%
At leat once a month	15.3%	7.9%	15.7%	7.6%	8.1%	5.5%	14.7%	10.0%
Once every 3 months	1.8%	4.5%	5.3%	6.0%	2.4%	3.3%	3.4%	3.4%
Once every six months	1.3%	1.5%	1.8%	2.2%	1.8%	3.8%	2.1%	1.9%
Once every year	1.5%	2.6%	1.4%	2.0%	0.3%	2.3%	2.4%	1.8%
Never	69.3%	80.5%	69.1%	78.6%	86.8%	76.8%	71.1%	77.3%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Figures based on sub-population that reported sending or receiving a letter or parcel. Source: 2010 ICT Survey

Table 6.61: Relationship between Accessibility and Use of Postal Services

Accesibility	Visits Kenya post offices?	
	Yes	No
Within walking distance	41.7	31.6
Reachable by car	56.9	58.2
Hard to reach	1.4	10.2
Total	100.0	100.0

Source: 2010 ICT Survey

On a regional level, monthly visits to post offices were clearly the most frequent. Nairobi, Rift Valley and Coast provinces had the highest proportion of people visiting a post office at least once a month (Table 6.60).

The findings in Table 6.61 support the idea that accessibility has an effect on the use of postal services: the longer the distance needed to reach a post office, the lower the probality that an individual had actually visited post office. The Postal Corporation of Kenya (PCK) was found to be the main institution that provided postal services for most users. As presented in Table 6.62, urban areas reported a higher use (76%) than the rural areas (63%), but in both cases it was by far the most frequent way to send mail. In rural zones, about 10% of the population used a relative or private individual to deliver their mail personally.

Table 6.62: Most Frequent Way to Send Mail by Area

	Rural	Urban	Total
Kenya Postal Corporation	63.1%	75.8%	69.3%
Other postal Operator e.g DHL, UPS, FEDEX etc	5.2%	3.9%	4.6%
Bus/transport company and other courier services	6.3%	5.8%	6.0%
Private individual/relative	11.4%	4.1%	7.8%
Depends on purpose	6.1%	6.1%	6.1%
Other	12.7%	8.9%	10.8%

Figures based on sub-population that reported sending/receiving a letter/parcel. Source: 2010 ICT Survey

In every province, the PCK was considered the main way to send mail. Other ways were of especially limited use, as presented in Table 6.63. This holds for all provinces except for North Eastern and Western where a private individual or relative was a common way to send mail than any other province (34%, 45% in rural zones).

Table 6.63: Most Frequent way to Send Mail by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Kenya Postal Corporation	59.9%	76.2%	78.5%	91.5%	44.4%	61.7%	75.8%	44.2%
Other postal Operator e.g DHL, UPS, FEDEX etc	5.4%	1.7%	3.6%	1.4%	1.0%	3.7%	9.6%	3.7%
services	5.9%	4.1%	8.7%	1.6%	16.0%	9.9%	4.1%	11.8%
Private individual/relative	6.9%	2.9%	8.2%	1.0%	34.4%	6.7%	6.5%	33.0%
Depends on purpose	10.3%	1.4%	3.1%	1.8%	4.7%	9.1%	5.7%	13.4%
Other	17.4%	17.5%	2.0%	2.7%	0.0%	13.5%	5.1%	0.6%

Figures based on sub-population that reported sending/receiving a letter/parcel. Source: 2010 ICT Survey

Table 6.64: Services Suggested to be added to Post Offices by Area

	Rural	Urban	Total
Internet access	8.4%	16.6%	12.1%
Telehone service	18.5%	12.7%	15.9%
More post office boxes	14.9%	13.3%	14.2%
Delivery to my residence	28.6%	43.6%	35.2%
Money transfer services	30.8%	20.3%	26.1%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

In Nairobi Province, other options such as transport or courier services were available and reported a higher proportions of users.

Table 6.64 presents additional of services suggested to be provided at the post offices. Most of the respondents were interested in home delivery and money transfer services. In rural zones, both of these services were mentioned in equal proportions while in urban areas delivery was mentioned by almost half of the respondents.

Table 6.65: Services Suggested to be added to Post Offices by Area and Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
Internet access	17.3%	12.7%	4.1%	6.7%	4.9%	6.5%	12.9%	23.3%
Telehone service	10.7%	12.4%	39.8%	15.1%	49.3%	18.3%	12.4%	10.3%
More post office boxes	14.6%	10.9%	23.9%	21.2%	7.2%	18.0%	9.6%	20.0%
Delivery to my residence	54.3%	17.3%	26.9%	43.7%	12.9%	35.4%	55.7%	18.7%
Money transfer services	15.0%	47.0%	4.7%	14.8%	29.8%	21.9%	14.1%	29.5%
Other	4.6%	0.1%	1.2%	1.0%	0.0%	1.1%	1.0%	0.0%

Figures based on sub-population that has access to the service. Source: 2010 ICT Survey

On a regional level, Table 6.65 shows that provinces with higher access rates like Nairobi have a strong preference towards home delivery. In the North Eastern Province most people wanted to have telephone service. In the Central Province, most respondents desired money transfer services.

Most post offices were not easy to access and a motorized vehicle was generally needed to reach them. Because of low demand and difficult accessibility, Kenyans visited a post office, on average, only once a month. PCK was by far the predominant channel for sending and receiving letters, in part because only PCK mail is allowed in post office boxes and delivery to these boxes is the only means for individuals to receive basic letter mail service. Individuals can receive home delivery from private couriers at higher prices than PCK's. When asked about other services that they would like for PCK to provide, the most frequently mentioned were home delivery and money transfer services.

Table 6.66: Percentage of People that Travel to another Location to Access Postal Services by Area

	Rural	Urban	Total
No	58.5%	43.4%	51.3%
Yes	41.5%	56.6%	48.7%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that reported sending/receiving a letter/parcel. Source: 2010 ICT Survey

6.4.2 Expenditure and additional costs associated with the need of travelling to access postal services

Table 6.66 shows that almost 50% of the population needed to travel to another location to access postal services, the highest proportion/ number relative to other services analysed in this report.

Table 6.67: Location of Access for People who Travel to Another Location to have Access to Postal Services by Area

	Rural	Urban	Total
Within the village or town	35.7%	61.1%	45.3%
In another village/town of the ward	43.2%	33.4%	39.5%
Outside of the ward but inside the district	18.6%	3.8%	13.0%
Outside of the ward but inside the region	2.2%	1.7%	2.0%
Other region different from own	0.3%	0.0%	0.2%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that need to travel to access this service. Source: 2010 ICT Survey

In rural areas, 42% of the population travelled compared to 57% in urban areas. The higher percentage of people travelling in urban areas suggested that a higher percentage of people in rural areas only use postal service when there is no need to travel.

Table 6.68: Average Time to Nearest Post Office (Hours) by Area

	Rural	Urban	Total
Average travel time	3.89	4.05	3.95

Figures based on sub-population that need to travel to access this service. Source: 2010 ICT Survey

Table 6.69: Means of Transport for People who Travel to another Location to Access Postal Services by Area

	Rural	Urban	Total
Walking	31.6%	56.6%	40.7%
Motorized public transportation	65.1%	40.3%	56.0%
Motorized private transportation	1.0%	3.2%	1.8%
Non motorized public transportation	1.9%	0.0%	1.2%
Non motorized private transportation	0.5%	0.0%	0.3%
Total	100.0%	100.0%	100.0%

Figures based on sub-population that need to travel to access this service. Source: 2010 ICT Survey

More than 80% of the people that needed to travel to access postal services did so within the village or travelled to another village in the same ward. Table 6.67 shows that in rural areas, a higher percentage of people needed to travel outside the ward or the district to access postal services.

Table 6.69: Means of Transport of People who Travel to another Location to Access Postal Services by Area

	Rural	Urban	Total
Mean expenditure	77.27	50.50	63.21

Figures based on sub-population that need to travel to access this service. Source: 2010 ICT Survey

On average, Kenyans travelled for about four (4) hours to get to the closest post office, longer than for telephone or Internet services (0.6 hours). Table 6.68 shows that there was little difference between rural and urban travel times.

Table 6.69 shows that most Kenyans who travelled to other locations to access postal services used motorized public transport. Walking was the next most frequently used means of travel, especially in urban zones.

In addition to the direct costs of using postal services, people spent on average KES 63 to get to the closest post office. The average expenditure on transport in urban areas was KES 51 compared to KES 77 in rural areas (Table 6.70).

Nearly 60% of the population had to use a motorized means of transportation to access postal services. Most of them travelled within their ward and took more than four (4) hours to travel. In a country where motorized transportation is relatively scarce and expensive, this means that individuals had to pay a high price just to deposit their mail (KES 63 or 252% of the cost of mailing a 20-gram letter within Kenya-KES 25).

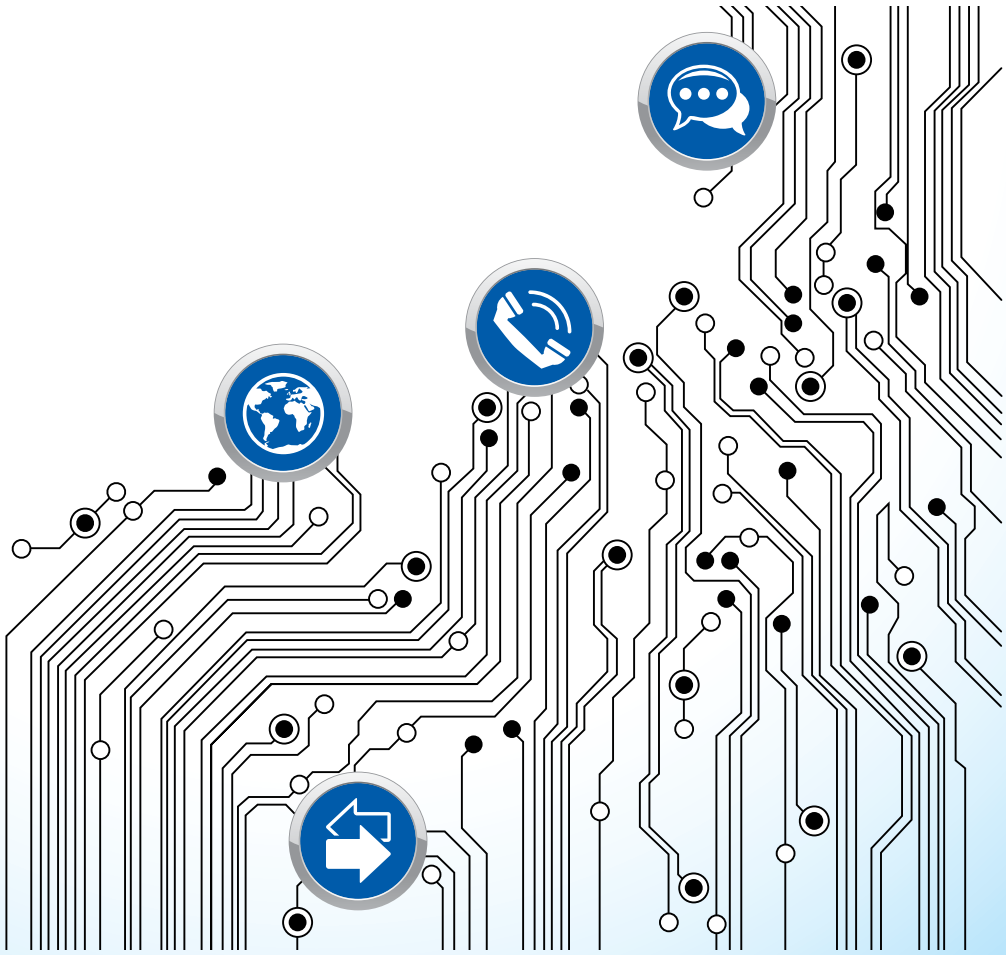


Table 6.71: Probit Regressions on Determinats of Access to Mobile, Internet and Postal Services (Marginal Effects)

VARIABLES	Mobile	Internet	Postal
Central-Urban	-0.152	-0.0431***	-0.0569
	(0.0930)	(0.0126)	(0.0440)
Central-Rural	-0.283***	-0.0663***	-0.0767**
	(0.0774)	(0.00961)	(0.0381)
Coast –Urban	-0.171**	-0.0397***	-0.0345
	(0.0821)	(0.0131)	(0.0446)
Coast-Rural	-0.342***	-0.0467***	-0.0946**
	(0.0843)	(0.0131)	(0.0389)
Eastern-Urban	-0.0687	-0.0412***	-0.0853
	(0.0747)	(0.0106)	(0.0591)
Eastern-Rural	-0.224***	-0.0767***	-0.169***
	(0.0716)	(0.0100)	(0.0353)
North Eastern-Urban	-0.0968	-0.0399***	-0.0127
	(0.106)	(0.0124)	(0.0673)
North Eastern-Rural	-0.421***	-0.0532***	-0.109**
	(0.0956)	(0.0110)	(0.0443)
Nyanza-Urban	0.0156	-0.0165	0.0488
	(0.0650)	(0.0246)	(0.0815)
Nyanza-Rural	-0.305***	-0.0625***	-0.127***
	(0.0765)	(0.00875)	(0.0347)
Rift Valley-Urban	-0.0806	-0.0386**	-0.100**
	(0.0819)	(0.0165)	(0.0423)
Rift Valley-Rural	-0.356***	-0.0718***	-0.133***
	(0.0776)	(0.00902)	(0.0360)
Western-Urban	-0.0970	-0.0473***	-0.116**
	(0.0831)	(0.00688)	(0.0480)
Western-Rural	-0.403***	-0.0677***	-0.124***
	(0.0811)	(0.00833)	(0.0369)
Has a radio at home	0.212***	0.0303***	0.0648***
	(0.0134)	(0.00747)	(0.0134)
Age	0.00898***	-0.000552	0.00750***
	(0.000865)	(0.000583)	(0.000964)
Age (squared)	-8.95e-05***	-4.41e-06	-6.02e-05***
	(8.45e-06)	(6.22e-06)	(9.81e-06)
Energy at home	0.0405***	0.0656***	0.117***
	(0.0123)	(0.00754)	(0.0130)

VARIABLES	Mobile	Internet	Postal
Can read or write	0.181***	0.0272***	0.100***
	(0.0116)	(0.00843)	(0.0117)
Employed or self employed	0.0808*** (0.00804)	0.00697 (0.00459)	0.0422*** (0.00830)
Observations	13,846	14,121	13,294
Pseudo R-squared	0.207	0.220	0.116

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: APOYO Consultoria

6.7 Determinants of access to mobile phones, Internet and postal services

In order to analyse the determinants of access to mobile phone, Internet and postal services, a probit regression was used on the National ICT Survey data. A probit model is the classic parametric model most suited to treat binary dependent variables, such as access to a certain service. In a probit model, each independent variable hypothetically affects the probability of the occurrence of the explained event that in this case refers to having access to a particular service. This widely used model has the strong assumption of normal distribution of the error and uses the maximum likelihood method to obtain the coefficients. Some of its advantages include the possibility of testing multiple hypothesis using asymptotic tests and making a flexible specification by not assuming that the probability is linear on its parameters. The results of the model are shown in Table 6.71.

The variables we have used to explain access to ICT services are 14 that indicate location as well as urban/rural classification (Nairobi is omitted to avoid multicolinearity)[8], a quadratic functional form for age, and proxy variables for level of income such as having any source of energy or a radio at home, employment status and illiteracy. The values presented in Table 6.71 represent the marginal impact of each of these variables on the probability of accessing mobiles phones (model 1), Internet (model 2) and postal services (model 3).

We found that for all three models a significant negative relationship between living in rural areas and accessing ICT services. In the model for mobile access (model 1) we established that all the people living in urban areas have the same probability of accessing mobile phones. Yet, for people living in rural areas the probability diminished between 22% and 42% depending on the province. We observed that people living in the rural areas of the North Eastern and Western provinces had the lowest probability of accessing mobiles phones.

In the model for internet access (model 2), we found that, besides the people living in urban Nyanza, people living outside Nairobi have a lower probability of accessing internet services compared to the people living in Nairobi. Moreover, we established that people living in rural areas have a lower probability of accessing internet services compared to people living in urban areas. The probability of accessing internet services in rural areas was 5% to 8% lower than the national average (12%), while the probability of accessing internet in urban areas was 0% to 5% lower than the national average. Regarding urban areas, people living in the urban areas of the Western Province had the lowest probability of accessing internet services. With respect to rural areas, people living in the rural area of Eastern Province had the lowest probability of accessing internet services.

In the model for postal service access (model 3), we established that in almost every urban area the probability of accessing postal service was the same. The only exceptions were the urban areas of the Rift Valley and Western provinces where the probability was 10% to 12% lower. We found that people living in rural areas had a lower probability to access postal services compared to the average people. People living in the rural areas of the Eastern province had the lowest probability of accessing postal services (17% lower).

[8] Each of the locality parameters of Table N° 71 has to be compared against Nairobi. For example the parameter for Central Rural in model 1 is significant and equal to -0.283, this means that people living in the rural areas of the Central province have 28% less probability of accessing mobiles phones compared to people

Table 6.71: Ordinary Leased Squares Regression on Mobile Telephone and Internet Services use

VARIABLES	Mobile use (in minutes)	VARIABLES	Used Internet in the last 12 months
Access to mobile phone	0.848	Access to Internet	0.797***
	(0.00362)		
Constant	0.000	Constant	0.00722***
	(0.00288)		(0.000827)
Observations	26,828	Observations	26,700
R-squared	0.671	R-squared	0.695

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: APOYO Consultoria

In addition to the location variables, we established that in most of the models that the probability of accessing ICT services was positively related to whether the household had a radio at home, the age of the person, whether the household had energy, whether the person could read or write, and whether the person was employed. Overall we found that variables that determined household's income status (radio, read and write, energy and employment) had a positive effect on access. Therefore, it seems that the probability of accessing ICT services increased with income.

The results of the regression analysis provide an additional criterion for prioritizing the programmes aimed at closing the access gaps. For example, we found that if the CCK finances ICT services in the rural areas of the North Eastern and Western provinces it will be making an important contribution to increase ICT access in areas where people currently have less probability of access. We also found that the size of the parameters of the individual variables (radio, age, read and write, energy and employment) was lower than the size of the location variables. The latter suggests that location is more important for determining ICT access than individual variables, implying that increasing the supply of ICT services will have a higher impact on access compared to increasing demand variables.

Increasing access is vital since there is an important relationship between accessing the services and using them. Table 6.72 shows that there is a significant and positive correlation between access to and use of mobile phones and Internet services. Though the definition of "use" employed in each the regression is different, the OLS estimators in both cases are very similar.

The positive correlation between access to ICT services and its use shows that investments in better access will have a positive effect on use. Thus, the CCK will contribute to increase the rate of utilization of ICTs and ICT-related services by focusing on providing greater access to these services. The direct result of this effort will be to introduce more Kenyans to the information society and allow them to benefit from it.

6.6 Costs of lacking access to ICT services

The lack of access to ICT services generates two additional costs when people use those services. In first place, an individual who lacks access to ICT services needs to travel to a different location where the service is provided. As a result, there are transaction costs involved (transportation, lodging, food and the opportunity cost of travelling). Second, the lack of access to the service reduces the individual´s welfare since his or her consumption of the service is limited to the times when the individual can travel to that location.

According to the ICT Survey, people who travel to access mobile telephone services spend KES 6.30 on phone calls. In addition, they spend KES 67 on transport and 36 minutes travelling. Considering the opportunity cost of time (i.e. the income that is not earned), travelling to access a mobile phone would have an opportunity cost of KES 34[9].

[9] People spend 36 minutes travelling to access a mobile phone, assuming an average minimum wage of KES 9 812 per month, 36 minutes would represent KES 24.

Therefore, the total cost of making call for people who need to travel will reach KES 107. Of this cost, 94% will represent only the cost of physically accessing the service.

In the case of Internet services, in addition to the connectivity rate, people spend almost KES 94 travelling (KES 60 on transportation and KES 34 in opportunity costs). If the average expenditure on internet services in one month is KES 750, a person that uses internet once a week will have to spend KES 376 only on travel (half of what they spend on internet services).

Finally, in the case of postal services, the additional cost of reaching a post office is KES 286 (KES 63 in transportation costs and KES 223 in opportunity costs). If the cost of mailing a 20-gram letter within Kenya is KES 25, travel costs will represent 11 times the cost of sending the letter.

Therefore, we observe that the lack of access to ICT services creates high costs for the population who use ICT services. Usually, the lack of access takes place in low-income and rural areas, making poor people pay more for the services than higher-income individuals living in urban areas.

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