



Communications
Commission
of Kenya

ANALYSIS OF 2010 ICT SURVEY



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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 equipments. 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 ICTs equipments and facilities. Education contributes to the development of human capacity building for effective use of the ICT facilities, especially the internet. For the development and maintenance of ICT infrastructure 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

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 people's 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 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 or older has access to a mobile phone (either because they have a mobile or because a relative or a friend has one). We find that mobile telephones are 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.

Only a small proportion of the population (5%) needs to travel to access the closest mobile telephone. This result is consequence of the high mobile coverage throughout Kenya. However, the proportion of the population that need to travel to access mobile phones spends on average

KES 67 in transportation to access the closest telephone. These transportation costs are a reason for the expansion of the services in areas currently not covered.

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 leads to the fact that the main form of access to the Internet is through cybercafés. Internet use is high among the people who have access to internet, more than 86% of the people who have access report using it. Thus, the main constraint on Internet use seems to be its availability. Emails 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 for transportation costs. 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 rare as Internet or fixed telephone access. Still in rural areas access rates are in most cases below 20%. Private post office box ownership is also scarce 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.

Accessibility of Kenya post offices depends on living in a rural or urban area. Though the proportion of people who declare that post offices are hard to reach is 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

difficult accessibility, 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 absence of direct local access to the service creates higher 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. We find that travel costs may represent 94% of the cost of making 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.

Access to data services is not as extended as access to voice services. For data services the access gap is: 90% of all villages in Kenya do not have access to Internet (76% of the population). As in the voice case, the availability of electricity and roads are also an important determinant of access to Internet services. There is no village with data services that is more than five kilometres away from a road.

With regard to broadcasting, with 79.5 percent of the population reporting right of use, access to radio services is the highest in the country compared to all other ICT services. In terms of ownership the population in Nairobi the highest ownership percentage compared to other provinces. The greatest discrepancy is between rural and urban in when it comes to ownership of television set where only 6.1 percent reported owning a TV in the rural areas as opposed to 22.0 percent in urban areas. The survey shows that the distance covered to access the Television facilities did not vary much on whether one is in urban and rural areas. The survey shows that the average distance covered is 2.1 km and 2.0 Km for rural and urban areas respectively. At 1.2 km, Coast province had the shortest distance covered to access Television services.

CHAPTER ONE: HOUSEHOLD SURVEY

The following analysis has been undertaken using the household questionnaire. The household questionnaire collected information for all the household members regardless of their age. Although the ICT survey data includes a population of people from three (3) years, the **analysis was restricted to members equal or older than 18 years old** in order to have in the sample members that can access, own, and use telecommunication services independently.

2.1 Voice Services

2.1.1 Access and Ownership of Traditional Fixed Telephones

Access to traditional fixed lines is low throughout Kenya. Table N°2 shows that 95% of people do not have access to fixed telephones. In rural areas the percentage of people that have access to it is 2.9% while the percentage in urban areas is 8.3%.

Table N°2: 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%

As expected, Nairobi has the highest level of access in Kenya. Table N°3 shows that the access pattern is uniform throughout the country, except for Nairobi and the Coast province. In all other provinces fixed telephone access is below 5%.

Table N°3: Percentage of 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%

1/ 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).

With regards to the place of access to fixed telephones, Table N°4 shows that in rural areas most people access the service at their office/place of work (37%) or at a payphone (27%) while in urban areas they access the service at their office/place of work (31%) or at their homes (42%). These three places concentrate more than 90% of the population's access to fixed telephone at the national level.

Table N°4: Main Place of Access to Fixed Telephone, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

At the provincial level, Nairobi and the Western Province have the highest level of access at home. In the Central, Nyanza and Rift Valley provinces access is higher at the office/place of work. In all other provinces, the main point of access is at payphones. As Table N°5 shows, there are slight differences in the point of access between rural and urban areas. For example, in urban Rift Valley province, the main point of access is the person's own home; in rural areas, on the other hand, it is the office/place of work. A similar situation takes place in the Western province.

Table N°5: Main Place of Access To Fixed Telephone, by Area and Province 1/ 2/

	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%

1/Figures based on subpopulation that has access to the service.

2/ 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).

Household ownership of fixed lines is also very limited in Kenya. Only 1.7% of all households in Kenya have a telephone at home. In rural areas, less than one percent of the households have a phone, while in urban areas the percentage reaches 3.8% (see Table N°6).

Table N°6: 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%

As in the case of access, fixed line ownership is concentrated in Nairobi (7.5%). All other provinces have ownership rates lower than 1.6%. This is shown in Table N°7.

Table N°7: Percentage of Households That Have a Fixed Telephone, by Area and Province
1/

	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%

1/ 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).

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 have a rate of access of less than 5%. The main point of access in Nairobi is people's 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.

2.1.2 Access, Ownership, Usage and Expenditure in Mobile Telephones

Unlike the case of fixed telephone lines, the rate of access to mobile phones is over 80% in Kenya. As Table N°8 shows, access to mobile phones is high in urban and rural areas. In urban areas more than 95% of the population has access while in rural areas 79% does.

Table N°8: 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%

Access to mobiles phones is high in all provinces of Kenya (Table N°9). The lowest access rate (61%) is found in the North Eastern province, which might be the result of low population density. Access in all urban areas is above 90%. Access in rural areas is lower but in almost all provinces is higher than 70%. Differences in access to mobile phones between rural and urban areas can be large in some provinces. For example, in the Coast province, access in urban areas is 91% while in rural access is 71%.

Table N°9: 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%

Table N°10 shows that more than half of the population in Kenya has access through their own mobile phone while a quarter uses a mobile phone that is available at home. The pattern is quite similar in both rural and urban areas. However in rural areas a higher percentage of population has access through a mobile phone from a friend's house.

Table N°10: Main Place of Access to Mobile Telephone, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°11 shows that at the provincial level the pattern is the same: in both urban and rural areas most people have access to the service because they own a mobile phone. Therefore not only access but ownership is high throughout Kenya.

Table N°1: Main Place of Access to Mobile Telephone, By Area and Province 1/ 2/

	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%

1/Figures based on subpopulation that has access to the service.

2/ 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).

Mobile ownership at the household level is almost as high as access. Approximately 75% of the households have at least a member who owns a mobile phone. In rural areas, ownership is 67% while in urban areas ownership reaches 90% (see Table N°12).

Table N°12: 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%

As Table N°13 shows, in all provinces more than 80% of urban households own a mobile phone. In rural areas the rate is above 60% except for the North Eastern province (53%).

Table N°13: 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%

According to the ICT Survey, a person aged 18 or older old uses a mobile phone on average 25 times a week. The average use in urban areas and rural areas is 32 times and 19 times a week

respectively. Table N°14 shows that the higher use in urban areas is found in Nairobi, while the higher use in rural areas is found in the Coast province. These results suggest a positive relationship between mobile use and wealth.

Table N°14: Average Number of Times in a Week that A Person Uses a Mobile Phone, by Area and Province 1/

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	22	25

1/Figures based on subpopulation that has used a mobile phone.

As shown in Table N°15, on average people in Kenya consume 50 minutes of outgoing calls in a week (39 minutes in the rural areas and 66 minutes in the urban areas). People in Nairobi make more calls than average (82 minutes a week). A high consumption of minutes is also found in the North Eastern province. Maybe the longer distances that have to be travelled in North Eastern province encourages the consumption of mobile phone more than in other provinces. Users from the rest of provinces consume similar amount of minutes.

Table N°25: Average Minutes Consumed in a Week, by Area and Province 1/

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

1/Figures based on subpopulation that has used a mobile phone.

Finally Table N°16 shows that mobiles users spend 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 is KES 324 while in rural areas is KES 185. The lowest expenditure is found in the Eastern province. Considering the aggregate time of outgoing calls, the implicit tariff per minute is KES 4.8 which is consistent with the tariffs set by the country's main operators.

Table N° 163: Average Weekly Expenditure in Mobile Phone Calls (KES), By Area and Province 1/

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

1/Figures based on subpopulation that has used a mobile phone.

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 or older has access to a mobile phone (either because they have a mobile or because a relative or a friend has one). We find that mobile telephones are a very important way to access ICT services in Kenya. On average, Kenyans spend KES 4.8 per minute per outgoing call and make calls for approximately 50 minutes in a week. In total, Kenyans spend around KES 242 per week making phone calls.

2.1.3 Expenditure and Additional Costs Associated with the Need of Travelling to Access Telephone Services

Table N°17 shows that around 4.6% of the population aged 18 or older has to travel to another location to use the telephone. In urban areas 3.9% of the population needs to travel while in rural areas 5.1% needs to travel. The low percentage of people that need to travel in both urban and rural areas shows that most of the populated areas in Kenya are already covered by voice services.

Table N°47: Percentage of People that Travel To another Location to Use the Telephone, by Area 1/

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

1/Figures based on subpopulation that do not own any type of telephone at home.

Most people that need to travel in order to access a telephone go as far as within the village or town¹. Only in a few cases people need to leave the village or the ward² to access a telephone (Table N°18).

Table N°18: Location of Access for People Who Travel to another Location to Have Telephone Access, by Area 1/

	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%

1/Figures based on subpopulation that needs to travel to another location to use the service.

Table N°18 shows that, on average, people that need to travel to access a telephone travel two kilometres. The small distance that needs to be travelled to access a telephone is the result of the high coverage of mobile services in Kenya. The average distance is similar in rural and urban ones.

Table N°59: Average Distance to the Nearest Telephone (Kilometres), by Area 1/

	Rural	Urban	Total
Average distance	1.99	1.79	1.97

1/Figures based on subpopulation that needs to travel to another location to use the service.

Table N°20 shows that on average people travel about 36 minutes (0.6 hours) to get to the closest telephone. Average times are similar for urban and rural areas.

Table N°206: Average Time to Nearest Telephone (Hours), by Area 1/

	Rural	Urban	Total
Average travel time	0.61	0.66	0.62

1/Figures based on subpopulation that needs to travel to another location to use the service.

Table N°21 shows that most people in urban and rural areas walk to the nearest telephone. The fact that most people walk to the nearest telephone supports the fact that distances are small to access the closes telephone.

¹ In this report, village or town make reference to a particular population centre, i.e. the locality within which one resides.

² In this study, the term ward will be used only where the questions on the ICT survey mention it. It has the meaning used by the KNBS: a ward is usually aligned to a Town Council's boundary and will typically cover one village and occasionally up to a maximum of two villages in areas with low population

Table N°21: Means of Transportation of People Who Travel to another Location for Telephone Access, by Area 1/

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%

1/Figures based on subpopulation that needs to travel to another location to use the service.

Source: 2010 ICT Survey

Table N°22 shows that on average, Kenyans who need to travel to have telephone access spend KES 67 on transportation. There is a significant difference between the cost that urban and rural people pay: while people living in urban areas pay KES 26, people in the rural areas pay more than KES 85.

Table N°72: Average Transportation Expenditure to Get Telephone Access (KES), by Area 1/

	Rural	Urban	Total
Mean expenditure	85.93	26.79	67.26

1/Figures based on subpopulation that needs to travel to another location to use the service.

Only a small proportion of the population (5%) needs to travel to access the closest mobile telephone (most of them living in rural areas). This result is consequence of the high mobile coverage throughout Kenya. However, the proportion of the population that need to travel to access mobile phones spends on average KES 67 in transportation to access the closest telephone.

2.2 Data Services

2.2.1 Access, Ownership, Usage and Expenditure in Internet Services

Table N°23 shows that only 13% of the population of Kenya has access to Internet. Access is found to be much higher in urban areas than in rural areas. In rural areas only 7% of the population has access to Internet.

Table N°83: 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%

Table N°24 shows that Nairobi is the province with the highest rate of Internet access. After Nairobi, the Coast, Nyanza and Central provinces are the ones with the highest Internet access (more than 10%). With the exception of the Western province, more than 15% of the population living in urban areas has access to the service. In rural areas, the highest access to internet is found in the Central, Coast, and Rift Valley provinces (more than 8%). Differences are found to be large between urban and rural access within provinces.

Table N°24: 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%

Most Kenyans access the Internet at an Internet café (38%). Others have access to the service at their workplace (21%), their home (17%) or via a mobile phone (16%). Table N°25 shows that the places of access are similar between urban and rural areas.

Table N°25: Main Place of Access to the Internet, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°26 shows that cybercafés are the main point of access to Internet in most provinces, both at the rural and urban levels. Exceptions of this are North Eastern and Central provinces, where the main access point is mobile phone and workplace, respectively.

Table N°26: 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%

1/Figures based on subpopulation that has access to the service.

With regard to ownership, Table N°27 shows that only 6% of all households are connected to internet at home. In urban areas, this number rises to 13% while in rural level it reaches only 3%.

Table N°27: Percentage of Households that Own an 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%

Table N°28 shows that besides Nairobi and the urban areas of Nyanza, Internet connectivity is very low throughout Kenya. Connectivity is more common in urban areas, except for the Rift Valley and Central provinces. The lowest internet connectivity is found in the rural areas of the North Eastern and Coast provinces.

Table N°98: Percentage of Households That Own an 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%

Table N°29 shows that 86% of the people who have access to Internet have used it in the past year. In urban areas the rate of usage is 92%, while in rural areas it is 73%. We find that most people that have access to internet use it. This result suggests that the main factor that hinders Internet use is the lack of access to the service (i.e. connectivity).

Table N°29: Percentage of People that Have Engaged in Internet Activity in the Last 12 Months, by Area 1/

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

1/Figures based on subpopulation that has access to the service.

In almost all provinces, people that have access to Internet use it, as it is shown in Table N°30. For example in Nairobi and other urban areas (Central, Nyanza, and Western) usage rates are near or over 90%. In almost all rural areas more than 60% of the population with access to Internet uses it (the only exception is the rural area of the Coast province). In all urban areas more than 80% of the population with access to Internet uses it. These findings provide further evidence of the fact that access is the main constraint on the use of the Internet.

Table N°30: Percentage of People that Have Engaged In Internet Activity in the Last 12 Months, By Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

Moreover, Table N°31 reveals that Internet is used quite frequently, with more than 50% of the people using internet on a daily basis. As usual, people living in urban zones use Internet more often than people living in rural areas.

Table N°111: Frequency of Internet Usage, by Area 1/

	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%

1/Figures based on subpopulation that has used the service.

At the province level, Nairobi, Nyanza and Western provinces have the most frequent users (Table N°32). The Eastern province, where access is the lowest among Kenya, also has the most sporadic users.

Table N°32: Frequency of Internet Usage, by Province 1/

	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%

1/Figures based on subpopulation that has used the service.

Table N°33 presents the average monthly expenditure on Internet connectivity. On average, Kenyans spend KES 750 per month on Internet connectivity. In urban areas average expenditure is KES 904, while in rural areas it is KES 476. Nairobi and Nyanza have the higher average expenditure while the Eastern province has the lowest expenditure.

Table N°33: Average Monthly Expenditure on Internet Connectivity (KES), by Area and Province 1/

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

1/Figures based on subpopulation that has used the service.

Table N° 34 presents the purposes and activities of internet use in Kenya. We find that the main purposes for using internet are: private use, entertainment, and work. We also find the internet is mainly used for communication activities. This result suggests that internet is perceived among the population as an important tool for reducing communication gaps. There is also an important use of internet for research. The results of Table N° 35 are found to be consistent between urban and rural areas.

Table N°3412: Purposes and Activities of Internet Use by Area 1/

	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 N°35 B: 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%

1/Figures based on subpopulation that has used the service.

Finally, Table N° 36 displays the possession of email accounts in Kenya which can be used as a proxy for internet access. We find that the percentage of people with email address in Kenya is low (around 10%). The highest percentage is found in urban areas.

Table N°136: 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 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 leads to the fact that the main form of access to the Internet is through cybercafés. Internet use is high among the people who have access to internet, more than 86% of the people who have 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.

2.2.2 Expenditure and Additional Costs Associated With the Need of Travelling to Access Internet Services

Table N°37 shows that around 35% of the population has to travel to another location to use Internet. In urban areas 39% of Internet users travel while 27% does so in rural areas. The high percentage of people that need to travel to use Internet is the result of the low penetration of Internet.

Table N°37: Percentage of People That Travel To another Location to Access Internet, by Area 1/

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

1/ Figures based on subpopulation that do not have internet connectivity in the household.

Almost 50% of the people who travel to have Internet connection travel within the village or town. However, we find a significant proportion of people that has to travel to another village or town in order to access internet (Table N°38).

Table N°148: Location of Access for People Who Travel To Access Internet, By Area 1/

	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%

1/Figures based on subpopulation that needs to travel to another location to use the service.

On average, Kenyans travel 2.7 kilometres to access Internet, a larger distance than the mobile case. The average distance is similar in rural and urban areas (see Table N°39).

Table N°159: Average Distance to the Nearest Internet Access Point (Kilometres), by Area 1/ 2/

Province	Rural	Urban	Total
Mean distance	3.0	2.7	2.7

1/Figures based on subpopulation that needs to travel to another location to use the service.

Table N°40 shows that Kenyans travel, 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 is an important difference in travel time between urban and rural areas: people living in urban areas travel around 30 minutes while people in rural areas travel almost an hour. The longer travel time in rural areas compared to urban areas is probably the reason behind the difference in access to internet between these areas.

Table N°16: Average Time to Nearest Internet Access Point (Hours), by Area 1/

Province	Rural	Urban	Total
Mean travel time	0.95	0.49	0.60

1/Figures based on subpopulation that needs to travel to another location to use the service.

Walking and motorized public transportations are the most common transportation means for Internet access (see Table N°41). Unlike rural areas, where almost 70% need to use some mean of transportation to access Internet, in urban areas there is a larger population that only has to walk (48%).

Table N°17: Means Of Transportation of People Who Travel To another Location for Internet Access, by Area 1/

	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%

1/Figures based on subpopulation that needs to travel to another location to use the service.

Table N°42 shows that on average, Kenyans who need to travel to access Internet spend KES 60 on transportation. There is a significant difference between the cost that urban and rural people pay: while people living in urban areas pay KES 41, people in the rural areas pay more than KES 100.

Table N°18: Average Transportation Expenditure to Get Internet Access (KES), by Area and Province 1/

Province	Rural	Urban	Total
Mean expenditure	100.0	41.4	59.1

1/Figures based on subpopulation that needs to travel to another location to use the service.

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 for transportation costs. In rural areas people end up paying KES 100 which represents almost 21% of the internet expenditure in rural areas. 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.

2.3 Postal Services

2.3.1 Access, Ownership and Usage of Postal Services

Table N°43 shows that 23% of the population aged 18 or older has 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 has access to postal services while in rural areas only 18% has access.

Table N°19: 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%

The access to postal service varies between provinces and urban and rural areas. Nairobi and Central province are found to be the provinces with the highest access to postal services. The urban areas of Nyanza is found to be the area with the highest access to postal service (54%) while the rural area of North Easter province is found to have the lowest access to postal service (9%). There is a significant difference between the access to postal services in rural and urban areas within the same province (Table N°44).

Table N°20: 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%

Table N°45 reveals that 15% of households have access to postal delivery services (meaning the ownership of a private post office box)³. In rural areas access is 11% while in urban areas it is 26%.

Table N°21: Percentage of Households that Own a Post Office Box, by Area 1/

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

1/Figures based on subpopulation that has access to the service.

There is a variation in the level of access to postal services among provinces and areas. While in the urban areas of North Eastern province access to postal service 44% in the urban areas of Eastern province access is 7%. Similarly while the urban areas of the North Eastern province have a 44% access to postal services, its rural areas only have an 8% access (Table N°46).

Table N°46: Percentage of Households that Own a Mailbox, by Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

³ It is unlikely that any individuals in Kenya receive mail at their residences.

Access to postal services in Kenya is not as rare as Internet or fixed telephone access. Still in rural areas access rates are in most cases below 20% (in urban areas access rates are around 30%). Private post office box ownership is scarce in Kenya, only 15% of the households have one and in most rural areas this proportion diminishes up to 10%. Nairobi and Central provinces register the highest access and ownership rates while Eastern province registers 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 share the same post office box.

The level of use of postal services in Kenya represents letters and parcels sent and received. Table N°47 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, only 11% of the population sent between one and ten letters, and 1% sent more than 10 letters. The situation is similar in both urban and rural areas but with a higher number of people who sent at least one letter in urban areas. Nairobi and Nyanza show up as the provinces where people send more letters (Table N°48).

Table N°22: Number of Letters Sent, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service

Table N°23: Number of Letters Sent, by Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°49 reveals that communicating personal issues is the most common purpose for sending letters. A smaller proportion of people send letters to pay bills (28%) and to deal with government affairs (21%) or financial institutions (18%). Except for paying bills, where the urban rate is higher, differences of purposes between areas are small.

Table N°24: Main Reason of Sending Letters, by Area 1/

	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%

1/Tables based on subpopulation that reported sending at least one letter.

Regional differences in certain purposes of sending letters are worth mentioning. In areas where access was found low, the dominant purpose of sent letters is 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 N°50.

Table N°50: Main Reason of Sending Letters, by Province 1/

	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%

1/Figures based on subpopulation that reported sending at least one letter.

Table N°51 and N°52 show that less than 5% of the population has sent a parcel in the last 12 months. In urban areas this rate reaches 8% of the population while in rural areas only 3% has sent a parcel. Nairobi and Nyanza are the provinces where most people send parcels.

Table N°51: Number of Parcels Sent, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°52: Number of Parcels Sent, By Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°53 shows that around 85% of the population aged 18 or older did not receive any letter in the past year. Only 13% of the population received between one and ten letters and only 3% received more than 10 letters. We find that the percentage of people that received letters is higher in urban areas compared to rural areas. When we analyze the number of letters received by province we find that Nairobi is the province where most people have received letters (Table N°54).

Table N°25: Number of Letters Received, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°26: Number of Letters Received, By Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

Receiving family information is the most common purpose of received letters (Table N° 55). Receiving bills is much more common for population living in urban areas (62%) compared to rural ones (28%). This is influenced by the presence of utilities in urban areas rather than rural areas. Bank statements are sent only to the 26% of the people who claimed receiving at least one letter. Table N°56 indicates slight differences between provinces on the dominant purpose for receiving letters.

Table N°27: Main Purpose of Receiving Letters, by Area 1/

	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%

1/Figures based on subpopulation that reported receiving at least one letter.

Table N°28: Main Purpose of Receiving Letters, By Province 1/

	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%

1/Figures based on subpopulation that reported receiving at least one letter.

As in the case of sent parcels, less than 5% of the population (8% in urban areas) has received a parcel within the last year (see Table N°57). Differences across regions are not very large. Nairobi and Nyanza are the provinces where most people have received at least a parcel (Table N°58). Sending and receiving parcels is not common in Kenya.

Table N°29: Number of Parcels Received, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°30: Number of Parcels Received, By Area and Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

There is a very low use of postal services in Kenya. Only 12% 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 14% of individuals in the survey *received* a letter in a year. The main purpose of sending or receiving mail by individuals is to communicate personal news. In addition, only 4% 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)..

However, the relatively low level of sending and receiving letters and parcels by individuals in Kenya is more likely tied to the low level of activity in mail generating economic sectors such as financial services, advertising, and utilities.

Accessibility of post offices depends on living in a rural or urban area, as is presented in Table N°59 and Table N°60. Though the proportion of people who declare that post offices are hard to reach is 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. Nevertheless, the relatively small number of individual mailers who consider 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 (55%) consider that post offices are hard to reach and this is most likely due to both the scarcity of offices and the demand generated by the refugee camp. In no other province no more than 12% of individuals consider post offices hard to reach.

Table N°31: Accessibility to Post Offices, by Area 1/

	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%

1/Figures based on subpopulation that has access to the service.

Table N°32: Accessibility to Post Offices, by Province 1/

	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%

1/Figures based on subpopulation that has access to the service.

Related to accessibility, Table N°61 presents the frequency of visits to post offices. Most people do not visit post offices at all (77%), especially in rural areas (85%). Most people that visit them

do so once a month or every 3 months (13%). As in the majority of post related statistics, rural and urban areas have the most evident differences compared with other ICT.

Table N°61: Frequency of Visits to Post Offices, by Area 1/

	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%

1/Figures based on subpopulation that reported sending or receiving a letter or parcel.

On a regional level, monthly visits to post offices are clearly the most common frequency. Population in Nairobi, Rift Valley and Coast provinces have the highest proportion of people visiting a post office at least once a month (Table N°62).

Table N°33: Frequency of Visits to Post Offices, by Province 1/

	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 least 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%

1/Figures based on subpopulation that reported sending or receiving a letter or parcel.

The results in Table N°63 support the idea that accessibility has an effect on the use of postal services: the longer the distance needed to reach a post office, smaller is the chance an individual had actually visited one.

Table N°34: Relationship between Accessibility and Use of Postal Services 1/

Accessibility	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

The Postal Corporation of Kenya (PCK) was found to be the main institution that provides postal services for most users. As presented in Table N°64, urban areas report a higher use (76%) than

the rural areas (63%), but in both cases it is by far the most frequent way to send mail. In rural zones around 10% of the population uses a relative or private individual to deliver their mail personally.

Table N°354: Most Frequent Way to Send Mail, by Area 1/

	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%

1/Figures based on subpopulation that reported sending/receiving a letter/parcel.

In every province, the PCK is considered the main way to send mail. Other ways are of especially limited use, as presented in Table N°65. This holds for all provinces except for North Eastern and Western provinces where a private individual or relative is a common way to send mail than any other province (34%, 45% in rural zones) and Nairobi, where other options such as transport or courier services are available and report the higher proportions of users.

Table N°365: Most Frequent Way to Send Mail, by Area and Province 1/

	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 services	5.4%	1.7%	3.6%	1.4%	1.0%	3.7%	9.6%	3.7%
Private individual/relative	5.9%	4.1%	8.7%	1.6%	16.0%	9.9%	4.1%	11.8%
Depends on purpose	6.9%	2.9%	8.2%	1.0%	34.4%	6.7%	6.5%	33.0%
Other	10.3%	1.4%	3.1%	1.8%	4.7%	9.1%	5.7%	13.4%
	17.4%	17.5%	2.0%	2.7%	0.0%	13.5%	5.1%	0.6%

1/Figures based on subpopulation that reported sending/receiving a letter/parcel.

Table N°66 presents the suggestions of services to be added to the post offices. Most of the surveyed Kenyans are interested on home delivery and money transfer services. In rural zones, both of these services are mentioned in equal proportions while in urban zones delivery is mentioned by almost half of the respondents.

Table N°37: Services Suggested to be Added to Post Offices, by Area 1/

	Rural	Urban	Total
Internet access	8.4%	16.6%	12.1%
Telephone 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%

1/Figures based on subpopulation that has access to the service.

On a regional level, Table N°67 shows that provinces with higher access rates like Nairobi have a strong preference towards home delivery. In the North Eastern province most people want to

have telephone service. In the Central province money transfer services are those most desired by respondents.

Table N°38: Services Suggested To Be Added To Post Offices, by Area and Province 1/

	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%
Telephone 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%

1/Figures based on subpopulation that has access to the service.

Most post offices are not easy to access and a motorized vehicle is generally needed reach them. Because of low demand and difficult accessibility, Kenyans visit a post office on an average of only once per month. PCK is 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 people would like for PCK to provide, the most frequently mentioned were home delivery and money transfer services.

2.3.2 Expenditure and Additional Costs Associated With the Need of Travelling to Access Postal Services

Table N°68 shows that almost 50% of the population needs to travel to another location to access postal services, more than any other service analyzed in this report. In rural areas 42% of the population travels compared to 57% in urban areas. The higher percentage of people travelling in urban areas may reflect the fact that a higher percentage of people in rural areas only use postal service when there is no need to travel.

Table N°39: Percentage of People that Travel to another Location to Access Postal Services, by Area 1/

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

1/Figures based on subpopulation that reported sending/receiving a letter/parcel.

More than 80% of the people that need to travel to access postal services do so within the village or travel to another village in the same ward. Table N°69 shows that in rural areas, a higher percentage of people need to travel outside the ward or the district to access postal services.

Table N°40: Location of Access for People Who Travel To another Location to Have

Access to Postal Services, by Area 1/

	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%

1/Figures based on subpopulation that need to travel to access this service.

On average, Kenyans travel around 4 hours to get to the closest post office, longer than for telephone or Internet services (0.6 hours). Table N°70 shows that there is little difference between rural and urban travel times.

Table N°41: Average Time to Nearest Post Office (Hours), by Area 1/

	Rural	Urban	Total
Average travel time	3.89	4.05	3.95

1/Figures based on subpopulation that need to travel to access this service.

Table N°71 shows that most Kenyans who travel to other locations to access postal services use motorized public transportation. Walking is the next most frequently used means of travel, especially in urban zones.

Table N°71: Means of Transportation of People Who Travel To another Location to Access Postal Services, by Area 1/

	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%

1/Figures based on subpopulation that need to travel to access this service.

In addition to the direct costs of using postal services, people spend on average KES 63 to get to the closest post office. The average expenditure in transportation in urban areas is KES 51 compared to KES 77 in rural areas (Table N°72).

Table N°42: Transportation Expenditure for Travel to another Location to Access Postal Services (PCK), By Area 1/

	Rural	Urban	Total
Mean expenditure	77.27	50.50	63.21

1/Figures based on subpopulation that need to travel to access this service.

Nearly 60% of the population must use a motorized means of transportation to access postal services. Most of them travel within their ward and take more than 4 hours to travel. In a country where motorized transportation is relatively scarce and expensive, this means that individuals must 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).

2.4 Access to Broadcasting Services

2.4.1 Access to Radio

Due to the low cost of transmitters and its public good characteristics, radio is just as common as mobile phones in Kenya. However, unlike mobile phone access, there are very little differences between access rates in rural (81%) and urban (86%) areas. The high penetration of radio can be explained by the absence of other mass communication media such as television or newspaper. Table N°73 presents the percentage of people that access radio by urban and rural areas in Kenya.

Table N°73: Percentage of People With Access to Radio

	Rural	Urban	Total
No	18.8%	14.3%	17.3%
Yes	81.3%	85.7%	82.7%
Total	100.0%	100.0%	100.0%

Access to radio is similar between provinces, as presented in Table N°74. Within province higher access is found in urban zones. The North Eastern and Coast provinces have the lowest access rate (70.6 and 73.2, respectively) and have the highest differences between urban and rural areas.

Table N°74: Percentage of People With Access To Radio, by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	81.2%	91.4%	73.2%	87.0%	70.6%	79.0%	83.5%	82.5%
Urban	81.2%	95.7%	82.3%	91.8%	94.8%	84.0%	86.7%	82.9%
Rural	-	89.3%	67.1%	85.5%	64.4%	77.3%	82.8%	82.4%

More than 76% of the households in Kenya own a radio, as can be seen in Table N°75. Area differences are slightly bigger than access results since ownership depends to a larger extent on income which is typically higher in urban zones.

Table N°75: Percentage of Households that Own a Radio

	Rural	Urban	Total
No	26.7%	18.6%	23.9%
Yes	73.3%	81.4%	76.1%
Total	100.0%	100.0%	100.0%

According to the survey (Table N°76), the province that shows the highest rate of radio ownership is Central (90%). The Coast and North provinces exhibit critical rural areas where barely more than half of households own a radio. Urban zones have rates of at least 75% (in the Coast province).

Table N°76: Percentage of Households that Own a Radio, by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of radio ownership	77.0%	89.6%	62.2%	78.8%	61.2%	73.7%	74.9%	76.2%
Urban	77.0%	95.8%	74.5%	82.8%	78.4%	86.0%	79.1%	83.3%
Rural	-	86.4%	53.3%	77.0%	56.5%	69.5%	73.8%	74.5%

2.4.2 Access to Television

Unlike radio, access to television is much lower in Kenya. Table N°77 shows that only 38% of the population of Kenya are able to access a TV transmitter. It is also worth noticing that access in urban areas is twice as big as in rural area (more than 60% compared to less than 30%). There is no other ICT service in the survey that shows such a big difference among areas.

Table N°77: Percentage of People with Access to Television

	Rural	Urban	Total
No	71.8%	37.5%	61.8%
Yes	28.2%	62.5%	38.2%
Total	100.0%	100.0%	100.0%

Big differences are also found between provinces and areas within each province, as can be seen in Table N°78. For example, in Central province around 40% of rural population has access to television while more than 60% has access in urban areas. In the North Eastern province, close to

70% of urban population access television while only 4% do so in rural areas. Nairobi has the highest access rate (78%) while North Eastern exhibits the lowest (17%).

Table N°78: Percentage of People with Access to Television by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of access in the province	78.2%	48.8%	41.0%	38.8%	17.1%	31.4%	47.0%	31.3%
Urban	78.2%	64.2%	63.9%	75.0%	68.3%	56.0%	67.4%	55.8%
Rural	-	41.6%	26.0%	27.5%	4.0%	23.2%	42.8%	26.6%

Table N°79 shows that ownership of television follows a pattern similar to access with high differences between urban and rural areas: 60% and 24%, respectively. When compared to radio ownership (another device that is used only to receive information), TV ownership suggests that households require additional attributes to own a TV (for example electricity).

Table N°79: Percentage of Households with a Television

	Rural	Urban	Total
No	76.3%	40.2%	63.7%
Yes	23.7%	59.8%	36.3%
Total	100.0%	100.0%	100.0%

Ownership of television varies among provinces as can be seen in Table N°80. Nairobi is the only province where more than 50% of households own a television. On the other hand, only 12% of households in the North Eastern province own a TV. Differences among urban and rural areas ownership are similar to the ones found in access. However, it is worth mentioning that in some rural areas less than 8% of households own a television transmitter (Coast and North Eastern provinces).

Table N°80: Percentage of Households with Television by Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western
% of TV ownership	69.8%	44.5%	25.0%	29.7%	12.2%	25.3%	36.7%	23.6%
Urban	69.8%	59.9%	48.8%	63.2%	53.3%	50.9%	55.5%	46.4%
Rural	-	36.6%	7.7%	15.3%	1.0%	16.6%	31.7%	18.4%

2.4.3 Distance Travelled to Access Television Services

The survey shows that the distance covered to access television services vary from one province to other. As indicated in Table N°81, the distances covered to access the Television facilities did

not very much depend on whether one is in urban and rural areas. The survey shows that the average distance covered is 2.1 km and 2.0 Km for rural and urban areas respectively. Coast province had the shortest distance covered to access Television services.

Table N°81: Average Distance Travelled to Access Television Services Per Province

	Nairobi	Central	Coast	Eastern	North Eastern	Nyanza	Rift Valley	Western	Rural	Urban
Television	2.2	2.2	1.2	2.3	2.4	2.6	2.2	1.6	2.1	2.0

CHAPTER TWO: COST OF LACKING ACCESS TO ICT SERVICES

The lack of access to ICT services generates two additional costs when people use those services. In the 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 in transportation costs 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 34⁴. 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 in transportation costs 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 costs (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.

⁴ 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.

CHAPTER THREE: CONCLUSION

Access to traditional lines is very limited in both urban and rural areas. With the exception of Nairobi and the Coast Province, all remaining provinces have a rate of access of less than 3.5%. The main point of access in Nairobi is people's homes; in all other provinces the main access points are offices or payphones. Since household ownership of a fixed telephone is low, we can conclude that most of its use is for business-related activities. In general, traditional fixed lines are not an important means of access to ICT services in Kenya since mobile phones are the main telecommunication service.

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 or older has access to a mobile phone (either because they have a mobile or because a relative or a friend has one). On average, Kenyans spend KES 4.8 per minute per outgoing call and make calls for approximately 50 minutes in a week. In total, Kenyans spend KES 242 per week making phone calls. Only 5% of the population (most of them living in rural areas) needs to travel to a different village to have access to a telephone. The extra expenditure this implies is a solid reason itself for the expansion of the services in areas not yet covered.

Access to Internet services is very limited throughout Kenya and differences in access between rural and urban areas are stronger than in mobile. While in most urban areas the rate of access is above 15%, in some rural areas access is less than 3%. Household ownership of Internet connectivity is also limited. People engage in Internet activities usually once a day or once a week. Email ownership is limited with strong differences between urban and rural areas. For example, in rural areas less than 5% of the population has an email account while more than 20% does in urban areas. On average, Kenyans spend KES 750 per month to use Internet and its main use is for communicating. On average, Kenyans travel almost three kilometres to get to the closest Internet connection, and it takes them 30 minutes in urban areas and about 60 minutes in rural areas. In addition to the connectivity fee, people who travel spend KES 60 on transportation costs (in some rural areas, people pay even more KES 100). The direct cost of transportation should be considered when analyzing willingness to pay for Internet services.

Access to postal services in Kenya is not as rare as Internet or fixed telephone access. Still in rural areas access rates are in most cases below 20% while in urban areas around 35% of the population can access postal services. Private post box ownership is also scarce. Nairobi and Central provinces register the highest access and ownership rates while Eastern province registers the lowest. 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 general, most post offices are not easy to access and a motorized vehicle is needed to reach them. Because of the difficult accessibility, Kenyans hardly visit a post office. Nearly 60% of the population needs to use motorized transportation to access postal services. This represents a significant investment of time and money (in comparison with the price of the service purchased). Most people travel within the ward and take more than 4 hours to access post offices. 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.

APPENDICES

Appendix I: General Assumptions Used for the Analysis Of the ICT Survey

The most common assumption made is related to access and ownership of all analyzed ICTs. Access to these services was assumed, in addition to affirmative answers, whenever later responses of a certain individual or its household implied its use. Such was the case when information about the access location, expenditure, or frequency of use was provided but access was denied. Also, ownership was assumed when later answers suggested the contrary, like having at least one mobile line. In the same spirit as the previous assumptions, the need to travel to another location in order to access any ICT was taken as true if some information about distance, expenditure or travel expenditures were provided. Naturally, all the variables related to this topic were conditioned on not owning the services, for example not having Internet connectivity.

The reason underlying these particular assumptions is that respondents didn't fully understand some of the questions, but responded reasonably to the later ones. In the end, more information is taken into account preventing dropping useful data provided by household members.

All numeric variables, such as distance, time, expenditure, and duration of calls are presented in their mean values. To avoid outlier values, all observations that lied above or below three standard deviations from the mean were replaced by the median of the variable.

In all the questions where "Don't know" was a possible answer, these were taken as "No" answers instead of missing values in order to focus on the dichotomy of this variables and to prevent the loss of valuable information. These questions are related to access and ownership of ICT services and other goods such as radios or email.

In some tables percentages were calculated using related subpopulations. The most common case of this is calculating ownership over the subpopulation that has access to a particular service. We do so because the interpretation of this feature is useful, easier and/or more evident in the analysis.

Finally some averages calculated in the report don't take into account zeros. This is the case for:

- i. Number of times mobile phone was used in the last week
- ii. Duration of calls in the last week
- iii. Amount spent in mobile phone in the last week
- iv. Amount spent in Internet connectivity
- v. Travel costs

Related to the previous explanation, if the individual didn't have to travel to access one of the three services and reported having spent zero shillings, then the observations were re-coded as missing values so that they wouldn't lower the average expenditures.

Details on the representativeness level of the survey

Confidence intervals and margins of error were calculated using the sample size formula:

$$n = \frac{z^2 \cdot p(1 - p) \cdot d}{e^2}$$

Where **n** refers to the sample size that corresponds to each province or area

z is the normal distribution associated to a confidence interval,

p is the ICT access rate, for all ICT services it was assumed to be equal to 0.5 (the most conservative statistical scenario)

d is the design effect, assumed to be equal to 2

and **e** is the margin of error.

Table N°99 shows that in that the results concerning the full sample and urban and rural areas are fairly precise (the margin of error is smaller than 5% and the confidence level is equal or higher than 95%). The results concerning each province sample also have a decent level of precision (a margin of error of 5% and a confidence level equal or higher than 90%). However, the results from the urban and rural areas of each province should analyzed cautiously since the level of precision is not high (in some cases the margin of error is 10% and the confidence level is 80%). The results from the urban and rural areas of each province should be uses more as a reference and should not be considered as definite.

Table N°73: Level of Confidence and Margin of Error for Each Sample

Sample	Number of households	Level of Confidence	Margin of error
National	6803	99.0%	2.5%
Urban national	5019	97.5%	2.5%
Rural national	1696	95.0%	4.5%
Nairobi Province	669	90.0%	5.0%
Central Province	958	95.0%	5.0%
Coast Province	707	90.0%	5.0%
Eastern Province	951	95.0%	5.0%
North Eastern Province	407	85.0%	5.0%
Nyanza Province	914	95.0%	5.0%
Rift Valley Province	1285	95.0%	5.0%
Western Province	824	95.0%	5.0%
Nairobi Province - Urban Area	669	90.0%	5.0%
Central Province - Urban Area	118	80.0%	10.0%
Coast Province - Urban Area	354	80.0%	5.0%
Eastern Province - Urban Area	72	80.0%	10.0%
North Eastern Province - Urban Area	65	80.0%	15.0%
Nyanza Province - Urban Area	126	80.0%	10.0%
Rift Valley Province - Urban Area	205	80.0%	10.0%
Western Province - Urban Area	87	80.0%	10.0%
Central Province - Rural Area	840	90.0%	5.0%
Coast Province - Rural Area	353	80.0%	5.0%
Eastern Province - Rural Area	879	90.0%	5.0%
North Eastern Province - Rural Area	342	80.0%	5.0%
Nyanza Province - Rural Area	788	90.0%	5.0%
Rift Valley Province - Rural Area	1080	90.0%	5.0%
Western Province - Rural Area	737	90.0%	5.0%

Appendix II: ICT Survey Questionnaires

<i>ICT infrastructure : ICT in Education</i>												
For which of the following activities did your Institution use the Internet during the last 12 months?	Does your Institution have a.....?			Does the institution has access to		What type of telephone facilities does your institution have?	Does the institution offer ICT subjects/courses?	How many students in your Institution attend ICT related subjects/courses?		How many qualified ICT teachers/lecturers are there in your institution?		Is ICT taken as an examinable subject in this Institution?
	Website?	Email Service	Domain Name?	Internet	Telephone			Male	Female	Male	Female	
1.Communicating(Email /Internet phone)	1=Yes	1=Yes	1=Yes	1=Yes	1=Yes	1= Fixed Telephone	1. Yes					1=Yes
2. Getting information about good and services	2=NO	2=NO	2=NO	2=NO	2=NO	2. Mobile Phone	2. No					2=NO
3. Getting information from government organizations, public authorities via websites or email	3=D/K	3=D/K	3=D/K	3=D/K	3=D/K	3=Both						3=D/K
4.Reading/Downloading electronic books, newspaper or magazine												
5.Purchasing or ordering goods or services												
6.Internet banking												
7. Providing customer service												
8. Research												
9. Other (Specify)												

Part B: ICT infrastructure : Access and usage by Household members

Serial No.	Does (name) have any kind of disability?	What kind of disability does (name) have?	To be administered to those aged 3+ years							If (name) has access to Fixed Telephone where does s/he access it?	If (name) has access to Mobile Phone where does s/he access it?	If (name) has access to internet where does s/he access it?	Did any member of this household use a computer in the last 12 months?
			Does (Name) has access to a.....?										
			Radio	Television	Pay TV	Fixed Telephone	Mobile phone	Computer	Internet				
1= Yes	1. Physical	1= Yes	1= Yes	1= Yes	1= Yes	1= Yes	1= Yes	1= Yes	1= Yes	1.Own house	1.Own house	1. Own house	1= Yes
2= No	2. Visual	2= No	2= No	2= No	2= No	2= No	2= No	2= No	2= No	2.A friends house	2.A friends house	2. A friends house	2= No
3= D/K	3. Hearing	3= D/K	3= D/K	3= D/K	3= D/K	3= D/K	3= D/K	3= D/K	3= D/K	3.Office/Work place	3.Office/Work place	3. Office/Work place	3= D/K
	4. Others									4 . Pay Phone /Booth	4. Pay Phone /Simu ya Jamii	4. Cyber cafe	
										5. Other	5. Other	5. Community centre	
												6. Educational Centre	
												7. Mobile Phone	
												8. Others	

Part B: ICT infrastructure : Access and usage by Household members

To be administered to those aged 3+ years									
Serial No.	If yes, where did the member of this household use computer in the last 12 months?	Did....use a mobile Phone during the last 12 months?	How many times in the last 7 days have you used your mobile phone?	How long did you spend on your mobile during the last 7 days?	How much did you spend on your mobile during the last 7 days?	Did ...you engage in Internet activities in the last 6 months	If YES how often	Where did the member of the household use internet in the last 12 months?	For what purpose was the internet used? <i>(Multiple responses allowed)</i>
	1.At Home	1=Yes					1. At east once a day	1.At Home	1=Private use
	2. A friends house	2=No					2. At least once a week	2. A friends house	2=Own business
	3.Office/Work place	3=D/K					3. At east once a month	3.Office/Work place	3=Work
	4.Cyber cafe					1=Yes	4. Once every 3 months	4.Cyber cafe	4=Entertainment
	5.Community centre					2=No	5. Once every six months	5.Community centre	5. Health
	6.Educational Centre					3=D/K	6. Once every year	6.Educational Centre	6=Other
	7.Others					If No skip to B48		7. Mobile Phone	
				Time in Minutes	KSh			8.Others	

Part B: ICT infrastructure : Access and usage by Household members

Serial No.	To be administered to those aged 3+ years	To be administered to those aged 3+ years					If Yes what type of internet connectivity does (name) have?	How much did (name) spend on internet connectivity in the last one month?	How many mobile lines do you have?	Does (name) have an Email address?
	For which of the following activities did (name) use Internet for the last 6 months (from any location)?(MULTIPLE Responses)	Does <u>(name)</u> own								
	1.Communicating(Email/Internet phone)									
	2. Getting information about good and services	Radio	TV	Mobile phone	Computer	Internet Connectivity				
	3. Getting information from government organisations, public authorities via websites or email	1= Yes	1= Yes	1= Yes	1= Yes	1= Yes	1=Fixed line			1= Yes
	4.Reading/Downloading electronic books, newspaper or magazine	2= No	2= No	2= No	2= No	2= No	2=Satellite(VSAT)			2= No
	5.Playing/Downloading computer games	3= D/K	3= D/K	3= D/K	3= D/K	3= D/K	3=Mobile Phone			3= D/K
	6.Watching movies/TV						4=Mobile Modem			
	7.Getting information related to health or health services						5=Other (Specify)			
	8.Purchasing or ordering goods or services									
	9.Internet banking									
	10. Research									
	15. Other (Specify)							(Kshs.)		