

Executive Summary

The project¹ being described in this report focused on universal access to communication services. These services are telecommunications, IT, broadcasting and postal. The **overall objective** of the project was to conduct research and consultations leading to the definition and articulation of a universal access (UA) strategic plan, the establishment and definition of a mechanism for funding universal access in the Kenya communications sector, and the preparation of operational guidelines for the implementation of the universal access strategic plan.

The project focused specifically on rural communications development and on the effective implementation of a chosen mechanism or mechanisms of universal access that leverage investment in communications for rural development. It was important that the UA strategic plan and funding mechanisms were responsive to diversity, reflecting the views and realities of different groups, for example, men and women.

The **specific objectives** of the project were:

- to conduct deskwork research and consultations to define UA, outline the options for achieving UA, evaluate the gaps in the provision of UA and plan the project
- to carry out a market assessment of the supply conditions and recommend a supply strategy
- to establish rural info-communications demand and user preferences, sensitive to issues of economic activities, gender, age, and so on
- to carry out a benchmarking study on interconnection and UA experiences in East Africa, in selected countries in the rest of Africa, in at least two emerging market countries and in two advanced countries
- to develop a UA strategic plan and recommend implementation guidelines

The **outputs** of the UA project were:

- inception report, including project plan
- supply strategy report
- geo-socio-economic characteristics and key indicators report
- baseline survey report, including strategies to transform needs into demand
- interconnection report, including a recommended interconnection model/plan between rural and other operators
- final report, with UA strategic plan, funding mechanism for UA and implementation guidelines

¹ The project is hereinafter referred to as the UA project.

The key highlights of the UA strategic plan are as follows:

The **vision** of UA is " *quality communication services that are accessible, available, and affordable and that lead to enhanced and sustainable rural communications development*". The corresponding **mission statement** is " *to provide an enabling environment and intervention for the development and implementation of communication infrastructure and services in rural and under-served areas*".

The project identified a total of 90 divisions that were un-served and were likely to remain under-served for the next few years. The project also identified 10 critical issues that were to be addressed to provide basic communication services in the under-served areas and meet the vision and mission of UA. Each of these issues was translated into a **strategic objective** and therefore the set of objectives to be achieved in the next five years are:

- (a) to achieve effective coverage in rural areas
- (b) to realize effective public access to quality basic communication services in rural areas
- (c) to make communication services affordable to Kenyans, especially the low-income groups
- (d) to facilitate the development of and access to a wide range of local and relevant content
- (e) to support the development of ICT human capacity required for rural development
- (f) to ensure efficiency in frequency applications processing and equipment type approval
- (g) to create and institutionalize an appropriate institutional framework for UA
- (h) to create a conducive regulatory and licensing framework for UA
- (i) to establish a sustainable funding for UA
- (j) to ensure that rural communications is sustainable

The **targets** to be achieved in the under-served areas that will be targeted over the next five years (2005-2010) are shown in the table below:

Service	Indicator	Target
Telecommunications	Rural teledensity	5.8
	People per public access telephone facility	800
Internet	Internet points of presence	One per district
	Percentage of Internet local content	60%-80%
Broadcasting	Percentage of TV and radio local content	30%-50%
ICT training	Number of ICT training institutions	One per district
Integrated	Telecentres offering integrated services	One per division
Affordability	Percentage of disposable income used on communication services	5%

The following are the **candidate projects** to be supported in order to achieve the above objectives and targets:

- provision of subsidies to operators and service providers to develop communications infrastructure to provide telephone services to 90 divisions
- provision of subsidies to operators and service providers to develop internet points of presence in 49 districts
- provision of loans to local private entrepreneurs to establish a public access centre (PAC) in each of the 90 divisions; the PACs will range from a simple community telephone, to a telephone bureau, to a cyber café and to a fully fledged telecentre offering a whole range of basic communication, including postal, services
- promotion of local content development through the support of communications content in initiatives
- promotion of ICT capacity building through the support of ICT training facilities in strategic institutions in 18 centres

The **total cost** of the above projects is **US\$ 12,285,000** over the five-year period which translates into **US\$ 2,457,000 per year**. The study has recommended that this cost be funded through a UA Communications Development Fund (UA/CDF) and the government's incentives. The following are the recommended sources of funds:

- the Government of Kenya, through duties and tax incentives
- the Communications Commission of Kenya (CCK) through initial seed funding and a 1% levy on gross revenue
- telecommunications operators and service providers through an additional 0.5% levy on gross revenue
- postal and courier operators through an additional levy of 20% of their respective current annual fees
- donations and grants from development partners and well-wishers

In the current financial year, it is recommended that the CCK contributes KShs. 20 million. This will go towards carrying out pilot readiness for the full implementation in 2005/2006. In the next five years (2005/2006 – 2009/2010), the total contributions to fund the UA programme is US\$ 2.850, US\$ 3.051, US\$ 3.259, US\$ 3.475, and US\$ 3.698, respectively.

Finally, the study makes the following recommendations:

- (a) to make specific changes in the Kenya Communications Act, 1998, (KCA 1998) and the Kenya Communications Regulations, 2001, by March 2005; these changes will enable the implementation of the recommended UA Communications Development programmes and other schemes aimed at UA from 2005/2006
- (b) to appoint the head of the UA Communications Development Unit (UA/CDU) by January 2005 who will then be able to coordinate the activities of the pilot projects; at the same time, at least one Project Officer must be available on a full-time basis from the time the UA/CD programme is approved by the CCK Board
- (c) to “sell” the UA strategic plan to the rest of the government, operators, development partners, and other key stakeholders; this is largely because the support of key stakeholders is necessary for the successful implementation of the UA/CD programme
- (d) to discuss the final report with the National Communications Secretariat with a view to incorporating policy implications of the UA strategic plan in the draft national ICT policy
- (e) to conduct a public consultation to review interconnection guidelines and principles
- (f) to review the market structure and market segmentation, to determine which operator has significant market power (SMP) in which market segments and to set commonly agreed criteria for market definition and SMP assessment. In this review, the following questions, among others, must be answered:
 - what are the various relevant costs attributable to interconnection for each operator?
 - at the current disposable income levels, what regulatory mechanisms are necessary in ensuring that reductions in interconnections costs are effectively transferred to the end-users?
- (g) to expedite the proposed Cost Study and incorporate, as terms of reference, the following:
 - identification of appropriate costs of various communication services in Kenya that can assist in establishment of fair and reasonable tariffs;
 - development of upper limit price cap levels for interconnection pricing to be applicable before the introduction of FL-LRIC model;

- recommend appropriate regulatory responsibilities to be allocated to all operators that provide interconnection in Kenya;
 - develop criteria for evaluating Access Deficit in the context of underserved areas, recommend appropriate subsidy proportion to cover deficits accruing from interconnection and this subsidy to progressively decline as business expands;
 - draw out accounting separation and cost allocation methodology and framework and develop periodic regulatory reporting requirement mechanisms;
 - once the various appropriate retail and wholesale costs and relevant end-users, termination, origination, transit, capacity rental etc rates have been identified, a public consultations forum to be held to seek the views of wider stakeholder community. The results of such consultation shall form the basis for implementation of the various rates.
- (h) to develop a proposal to draft a convergence bill
- (i) to establish an ICT research unit to study market trends, collect and collate data, provide first hand information to potential investors, develop targets for various strategic market segments and, in liaison with other relevant departments, participate in periodically reviewing the market structure and licenses
- (j) to put the communications services coverage information in this report on a geographical information system (GIS), together with the socio-economic and demographic information on all regions of the country, to obligate, through license conditions, all the operators and service providers to provide their coverage data to CCK on a quarterly basis, and to have the ICT Research Unit update the GIS on a continuous basis. The cost of establishing the geographical information system is US\$42,701 or KShs. 3,458,751
- (k) to extract chapter 9 of this report to make an operational manual that will guide the operationalization of the communications development fund
- (l) to draw up the final list of the under-served areas after consulting operators on their coverage plans
- (m) to carry out pilot projects of the provision of selected basic communication services; the following pilot projects are recommended:
- establishing two Internet points of presence in two of the poorly served districts
 - developing two fully fledged community telecentres, operated by local entrepreneurs, offering telephone, Internet and basic postal services as well as other business centre services such as fax and photocopying

- providing basic postal services through a telecentre offering other communications services
- providing local and relevant content by institutions that have or can easily develop this content in support of the e-government strategy; this content is to be hosted in the two telecentres in the pilot and in other places where the public can easily have access

The cost of the pilot projects will be US\$ 110,500 or KShs. 8.95 million.

- (n) to procure consultancy services to help prepare for the pilot projects, to monitor them over a period not less than six months, to evaluate their performance and impact and to disseminate the results to key stakeholders; the estimated cost of the consultancy services is **US\$ 85,456.79** over a period not exceeding nine months. The total cost of the pilot projects, including the cost of supporting the projects and establishing a geographical system on coverage information as outlined above, is thus **US\$ 238,658.79** or **KShs. 19,331,362.00**. The seed money provided by CCK in 2004/2005 can cover all this cost

1. Background

1.1 The Need for the Project

The rapid and continuing growth and development of information and communications technologies (ICTs) is transforming the ways in which we live and work. The role of ICTs in transforming national as well as global development has been recognized the world over. To achieve national and human development, for example, many countries have exploited the ability of ICT to deliver information for strategic decision-making in the government, international trade, agriculture, manufacturing, social services and other sectors. It has therefore been accepted that access to communication services will empower rural communities to participate and contribute to national socio-economic development.

The KCA 1998 and the government's policy guidelines broadly call for government subventions to support UA and expansion of communication services to all parts of the country, including the rural areas. The policy guidelines document² contains broad targets on telecommunications development, and the CCK has an obligation to implement these guidelines.

The project described in this report focused on UA to communication services. These services are telecommunications, IT, broadcasting, and postal. The focus on these services has been necessitated by a convergence³ of telecommunications, broadcasting, and IT. Overall, the project was necessitated by a number of key factors.

First, Kenya does not have a workable policy and strategy that tackles problems of access to ICT and postal services by the majority of its citizens, especially citizens in the rural areas. It is important that a mechanism be developed to enable the rural population access affordable benefits of communication services because the majority of the country's population resides in rural areas.

Second, the existing mechanisms for extending communication services to rural areas have not worked well. For example, the roll-out obligations in operators' licenses and other reform initiatives by the government in the last five years have not had much impact on availing communication services to the rural areas. As an example, a special licensing programme for Regional Telecommunications Operators (RTOs) to deliver telecommunication services to the rural areas was first devised in 1999. The attempt to license RTOs to compete with Telkom Kenya

² Telecommunications and Postal Sector Policy Guidelines gazetted in December 2001.

³ Convergence can be generally defined as the ability of different network platforms to carry essentially similar kinds of services, and particularly the coming together of consumer devices such as the telephone, television, and personal computers. Convergence is not just about the technologies that have come together but also about the services that these technologies provide.

Limited (TKL) and focus resources into rural areas in 2001 has not taken off, however. Only one of the selected operators has been licensed. This operator has not yet rolled out their network. At the same time, competition between operators, especially the mobile operators and Internet Service Providers, has tended, as expected, to marginalize the less immediately lucrative rural areas.

Third, the penetration of communication services is skewed towards urban areas, especially towards provincial capitals. There is thus need to ensure widespread availability to rural people of basic communication services of acceptable quality and at affordable prices. This need is made even more urgent by the fact that there are huge disparities in socio-economic development between rural and urban areas.

Fourth, it has been accepted that access to communication services will empower rural communities economically and enable them to participate and contribute to the national socio-economic development. This will also help to address the huge socio-economic divide mentioned above. The rapid growth of mobile telephony in the country is demonstrating the tremendous capacity and potential for communications development, including development in rural areas.

Thus, the development of a well-integrated UA strategic plan and operational guidelines for its implementation are critical to Kenya. This is what is being reported here after a well-designed UA project.

1.2 Outline of the Project

The **overall objective** of the project was to conduct research and consultations leading to the definition and articulation of a UA strategic plan, the establishment and definition of a mechanism for funding UA in the Kenya communications sector, and the preparation of operational guidelines for the implementation of the UA strategic plan.

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The **project team** was composed of two teams; the client (the CCK) team and a team of consultants. The project team and its responsibilities are summarized in Table 1.1 below.

Table 1.1: The Project Team and Responsibilities of Members

Members of Team	Organization	Title in Project	Responsibilities
Mr. Sammy Kirui	CCK	Project Leader	
Mr. Alloys Ochieng and Mr. Kahindi Ngei	CCK	Project Co-leaders	
Mr. Matano Ndaró and Ms. Stella Ndemo	CCK	Research Assistants	<ul style="list-style-type: none"> ▪ Work closely with the consultants, especially in the various studies
Mr. Godfrey Mutsotso	None - individual	Project Officer	<ul style="list-style-type: none"> ▪ Project documentation ▪ Run the project office on day-to-day basis
Dr. Timothy M. Waema	Total Information Management Ltd.	Team Leader	<ul style="list-style-type: none"> ▪ Inception report ▪ Report on UA in Kenya ▪ Final report ▪ Quality control over all reports
Dr. Gaston Zongo	None - individual		<ul style="list-style-type: none"> ▪ Benchmark report on interconnection principles and

Members of Team	Organization	Title in Project	Responsibilities
			<ul style="list-style-type: none"> models ▪ Interconnection report with recommended interconnection models for Kenya
Mr. Muriuki Mureithi	Summit Strategies Ltd.		<ul style="list-style-type: none"> ▪ Report on supply conditions in key ICT sectors ▪ Report on universal access experience in Uganda and Tanzania
Prof. Dorothy McCormick and Dr. Mary Omosa	Institute for Development Studies, University of Nairobi ⁴		<ul style="list-style-type: none"> ▪ Baseline research methodology and design ▪ Report on geo-socio-economic characteristics and key indicators ▪ Baseline survey report

The project involved stakeholders in telecommunications, IT, broadcasting and postal sub-sectors in four different workshops. The objective of involving stakeholders was to assist in data collection and fine-tuning the outputs of the project and to ensure public representation and maximum buy-in to both process and outcomes. There were four workshops as outlined below:

- launch workshop—to explain the workshop to key stakeholders
- demand and supply workshop—to discuss the findings of the baseline survey and supply conditions studies with key stakeholders
- interconnection workshop—to discuss the proposed interconnection model for Kenya with key telecommunications operators
- final workshop—to discuss the proposed UA strategic plan and guidelines for its implementation with key stakeholders

1.3 Definitions

1.3.1 Rural Areas

In the baseline survey, we chose to use the definition of rural areas in the Population and Housing Census of 1999. In the census, a sub-location was segmented into convenient areas called the Enumeration Areas (EAs). Therefore rural areas were defined to be conglomerations of EAs with the following characteristics:

- population fewer than 2,000 persons
- exclusion of areas falling inside the boundaries of designated cities, municipalities, towns and urban centres

⁴ Institute for Development Studies worked closely with the Central Bureau of Statistics (CBS) on the Baseline Survey.

- poorly developed physical infrastructure, including roads, electricity, and water

1.3.2 Universal Access

Different countries have defined UA in different ways, often depending on their national communications sector conditions, policies, or plans. Some of the key factors that will make the definitions differ include the level and distribution of national incomes, the distribution of the population, and the penetration of communication services to individuals and households.

In most developing and emerging economies, where the penetration of communication services is very poor, the key concern is how to provide the greatest possible number of populations (public) with access to a basic set of communication services. This basic set varies from country to country. In the earlier days, the only communication service that was considered was a public pay phone for telecommunications sector and a basic letter service for postal communication sector.

Examples of UA definitions are:

- a telephone in every locality of more than 500 people (Ghana)
- a telephone every 20 kilometres (Burkina Faso)
- a telephone within a 30-minute travelling distance (South Africa)

The targets in these UA definitions however change with time. As one target is met, UA is redefined at a higher level.

For purposes of this study, we recognized that the issues of access in an information age have moved beyond access to a public payphone or a postal outlet. Partly due to convergence of technologies and the pervasive impact of ICTs in rural areas, the set that constitutes basic services for purposes of defining UA has become much wider. In this report, we considered the basic communication services to be a package that includes public access to telephony, Internet, multimedia, radio and television signal, local and relevant content, letter, philatelic, and private letter boxes. This package of services should be accessed through telecentres or public/community centres, cyber cafes, public/community telephone payphone booths, and postal outlets.

For purposes of this report, we took universal service (US) as a higher level concept referring to availability, non-discriminatory access and widespread affordability of services (ITU's 1998 World Telecommunications Development Report). UA is then defined as reasonable access to communication services for all including the

under-served and un-served in the rural areas through public access points at affordable prices. It has the following components:

- **accessibility**—non-discriminatory access to communication services irrespective of geographical location or race, sex, religion, and so on
- **affordability**—ensuring that communication services are priced in such a way that all citizens can afford them
- **availability**—nation-wide coverage or availability of communication services wherever and whenever required

This definition therefore includes US for people who can afford and wide spread provision of public service points for others. In developing economies, UA as opposed to Universal Service is the most feasible way of dealing with access gaps that exist⁵. In Kenya, like in most developing and emerging economies, two access gaps are identifiable: market efficiency gap and true access gap⁶ that require different approaches in dealing with them. The market efficiency gap can be bridged through more private provision of services facilitated by effective competition and by market-oriented policies and regulations that create a level playing ground for all operators (Intelcon, 2002). The true access gap can only be addressed through mobilizing additional investments, for example the Universal Access Fund. The main focus of UA policy development is on the true access gap.

In general, while US and UA policies can be quite different, the concepts are clearly quite related. For purposes of this study, we believe that UA is a more relevant concept than US. The strategic plan that we present in this report aims at achieving UA but this will also help to achieve the more long-term goal of US.

1.4 Outline of the Report

Chapter 2 gives a review of the national context that might have a bearing on access to communication services. Specifically, it provides an overview of the geographical and socio-economic characteristics of the country, with implications for communication services in the rural areas as the primary concern. It also assesses the status of the government's planned interventions in ICT as the Economic Recovery Strategy for Employment and Wealth Creation, 2003-2007, (ERS) and summarizes other relevant interventions in the government plans. The

⁵ UA is a goal adopted by developing countries to provide convenient and affordable access to communication services to the community through public and private access facilities. Universal service is mechanism mainly adopted by developed countries to spread communication services to all individuals or households.

⁶ The market efficiency gap is the difference between what markets are actually achieving under the current conditions, and what they could achieve if regulatory barriers were removed and regulation is used to provide incentives. The true access gap exists in areas and among population groups that cannot be served even with the most attractive liberal market conditions.

chapter ends with a summary of the key opportunities and challenges that emerge out of the review of the national context.

Chapter 3 provides a review of the communications sector. It provides an overview of policy and regulation, national ICT policy, reforms in the communications and the performance of the communications sector in the last five years of liberalization. The chapter ends with a summary of the key opportunities and challenges that emerge out of the review of the communications sector.

Chapter 4 summarizes the results of the study that focused on establishing the factors that inhibit operators and other suppliers from providing communication services in the rural areas and recommending appropriate supply strategies. This summary focuses on an analysis of the supply situation and makes recommendations.

Chapter 5 presents the methodology that was used to carry out the baseline survey and summarizes the findings. The findings are summarized along the issues of availability, accessibility, affordability, demand for and knowledge of services and user preferences for the key types of communication services. The chapter ends with some recommendations.

Chapter 6 summarizes the findings of the UA studies in Kenya, Uganda, and Tanzania, focusing on UA policy and experiences, regulatory framework for UA, funding and sustainability of UA, indicators and targets of UA and ability to meet the targets, and desirable institutional framework to administer UA. The chapter also makes recommendations with respect to the UA studies in the East African countries. The second part of the chapter discusses interconnection guidelines, principles and models based on an interconnection study. The chapter ends with recommendations, an implementation plan for these recommendations and a framework for an interconnection booklet.

Given the analysis and the findings of the various studies in the earlier chapters, chapter 7 provides the strategic plan for UA. This includes a vision and mission of UA to communication services, the strategic issues that represent the fundamental challenges underpinning the provision of and access to communication services, the objectives and targets for each of these issues and the strategies to achieve the stated mission and objectives.

Chapter 8 presents the implementation plan. For each of the objectives identified in chapter 7, the implementation plan provides the targets over the five-year period, the strategies, the intermediate outputs, the timeframe for achieving targets and outputs and the person or office responsible. This chapter also gives the implementation plan of the UA communications development programme.

Chapter 9 contains the proposed operations procedures that will ensure that UA to communication services take place efficiently and effectively, while chapter 10 gives the recommendations that CCK should implement immediately.

2. National Context Review

2.1 Geo-socio-economic Overview

2.1.1 Location and Administrative Boundaries

Kenya is located between latitudes 4 degrees 21 inches North, and 4 degrees, 28 inches South, and longitudes 34 degrees and 42 degrees East. The country is almost bisected by both the Equator and longitude 38 degrees East. The country borders Uganda to the west, Tanzania to the south west, the Indian Ocean to the south, Somalia to the east, and Ethiopia and Sudan to the north.

The latitudinal position of Kenya and its surface topography combine to create a physical environment with varied characteristics that cannot be broadly described as equatorial. The country has temperate lands mainly found in the former white highlands covering parts of the Rift Valley, Nyanza and Western provinces; and a near desert climate largely found in North Eastern and parts of Eastern and Rift Valley provinces.

Nevertheless, about two-thirds of Kenya's land area is suitable for human habitation. Most of this land lies in the relatively wetter south-western parts of the country, with a narrow strip along the shores of the Indian Ocean. Only about 20% of the total land area however can support crop and animal life optimally. Another 10% of the land area is classified as semi-arid while the remaining 70% is arid or desert. Consequently, 80% of the total land in Kenya is either arid or semi-arid (Ogendo, 1972).

Administratively, Kenya is divided into eight provinces: Western, Nyanza, Rift Valley, Central, Eastern, Coast, North Eastern, and Nairobi. Each of these provinces is further divided into districts, divisions, locations, sub-locations, and villages. Generally, these administrative entities also vary according to topography, physical features, natural resource endowment, economic activities, population size, and its inhabitants' socio-cultural practices.

2.1.2 Physical Features

Kenya has a land area close to average for Sub-Saharan Africa--582,646 square kilometers. This is more than double the size of Uganda (235,855 square kilometers) and 66% of Tanzania (886,000 square kilometers); 98% of Kenya's total area is dry land. Water covers only about 11,230 square kilometres, equivalent to about 2% of the total area. The Rift Valley Province is the largest of the eight provinces, followed by Eastern, North Eastern and Coast provinces. Nyanza, Central and

Western provinces are the smallest provinces, in spite of them carrying the highest number of inhabitants.

Kenya has a diverse topography that includes lakes, rivers and mountains. Most of these features have contributed to making the country one of the most favourite tourist destinations. The topography has implications for the type of economic activities that residents can engage in and, the extent to which key services could be readily available. Related to this is that these physical features have sometimes become a key hindrance to accessing communication services, to the extent that some of the physically inaccessible areas are also the most underserved.

The country's geographical features range from the warm coastal strip to the cool highlands, deep rift valley, grassy plains and even desert (Muriuki 2001, p.136). The distribution of some of the country's most prominent physical features vis-à-vis the national administrative boundaries suggests that these features tend to cluster in certain parts of the country. What is not immediately apparent, however, is the extent to which proximity to any of these features may influence the actual availability of various communications services and potential access to these services by those who may need them.

2.1.3 Physical Infrastructure

Generally, linkages between rural and urban areas of Kenya are dependent on the quality of the road network. Indeed, some of the communication service providers have continued to locate their services by major highways.

It is estimated that only 14% of the country's road network is fully developed and under tarmac and much of this is listed under international trunks. Instead, over 54,353 kilometres of Kenyan road network is earth/gravel, implying that communication during the rainy season is easily hampered.

The larger proportion of the more developed road network falls within urban boundaries and the agriculturally productive areas. Thus, the distribution of quality roads is skewed and some parts remain locked out of benefits accruing from being in the loop. Among the possible disadvantages is that areas that are left out remain remote and therefore unreachable to commercial ventures. This means that they may have neither the incomes nor the required commercial viability to attract investments, communication services included.

2.1.4 Demographic Characteristics and Features

According to the 1999 National Housing and Population Census, Kenya has a population of 28,686,607 people. The Rift Valley Province has the highest proportion of the country's inhabitants (6,987,036) followed by Eastern (4,631,779)

and Nyanza (4,392,196) provinces; North Eastern has the smallest population size of less than a million.

Over 18.6 million of the country's population lives in the rural areas. The majority of the country's population lives in the rural areas, although there is an evident reduction in the number of rural dwellers compared to rural dwellers captured in the 1989 Population Census. At the provincial level, Rift Valley has the largest proportion of rural dwellers (5,202,976), followed by Eastern (3,556,828), Nyanza (2,811,703), Western (2,556,023), and Central (2,553,361); Nairobi is the most urbanized.

There are about 6.4 million households in Kenya, with an average household size of five persons. Close to 14.5 million of the total population is female compared to about 14.2 million males. Some regions report a sex ratio of more men than women.

Population density, at 38.7 people per square kilometer is just above that of Tanzania, but well below that of Uganda at 102 people per square kilometer; this however hides *massive* regional variations, ranging from 3 persons per sq. km in the North Eastern Province to 300 or more in the Nyanza and Western provinces. Some districts population densities range from as low as two persons per square kilometer to 400-500 persons per square kilometer. Kenya's low population density provinces (Coast, North Eastern, Eastern, and the northern Rift Valley) form well over half of the country's land area, and thus offer significantly more challenges for communications policy makers than most countries in the sub-region face.

Most of the country's rural population is engaged in subsistence farming, and women constitute the majority in this sector. Across provinces, close to one half of the female population in Western, Nyanza, Eastern and Central provinces is engaged in agriculture compared to only between one fifth and one third of their male counterparts (see Table 2.1 below). Forestry, fishing, mining, and quarrying make up minor occupations; this cuts across the gender divide. The same applies to occupations such as manufacturing, construction, electricity/water and transport/storage or trading, finance, real estate, and public administration.

Table 2.1: Percentage Population Distribution by Industry

Province	Agriculture		Forestry		Fishing		Mining & Quarrying	
	Male	Female	Male	Female	Male	Female	Male	Female
Western	31.3	47.7	-	-	0.3	0.3	0.2	0.2
Nyanza	27.4	45.1	0.2	0.0	1.1	0.7	0.6	0.2
Rift Valley	31.6	38.0	0.3	0.5	0.2	0.1	0.3	0.1
Central	21.2	44.1	0.4	0.1	0.2	0.0	0.6	0.1
Eastern	28.5	44.4	0.4	0.0	0.2	0.2	0.7	0.2
Coast	16.7	28.6	0.1	0.1	0.6	0.1	0.5	0.1

Province	Agriculture		Forestry		Fishing		Mining & Quarrying	
	Male	Female	Male	Female	Male	Female	Male	Female
North Eastern	31.4	31.4	0.2	-	0.1	-	0.1	-
Nairobi	1.0	2.2	0.2	-	0.2	0.2	0.2	0.2
Total Population	3,017,075	4,557,490	32,561	18,993	45,081	26,689	53,096	20,034

Source: Kenya, 2001

On average, household incomes are highest in Nairobi followed by Rift Valley, North Eastern, Coast, and Central provinces (see table 2.2 below). Provinces with the least average household income include Eastern, Nyanza, and Western. Non-agricultural sources tend to earn households more money than any agriculture-based activities. Urban areas (and Nairobi in particular) however derive most of their income from non-agricultural sources. This is similarly the case for Coast, Rift Valley and Central provinces. Households in Nyanza Province derive the least income from non-agricultural wages, salaries, or profits.

Table 2.2: Mean Monthly Household Income from Different Sources by Province (KShs)

Province/ Area	Total Non-Agricultural Income		Total Agricultural Income		Total Average Household Income
	Wages/Salaries /Profits	Other Non-Agricultural Income	Agricultural Income	Crop Income	
Nairobi	13,557	2,795	438	2.4	16,789
Western	3,602	1,158	1,792	1,107	7,659
Nyanza	2,920	1,457	1,721	652	6,750
Rift Valley	4,863	1,262	3,892	2,225	12,241
Central	4,489	1,571	1,604	1,603	9,267
Eastern	3,046	1,138	1,812	577	6,572
Coast	6,034	1,625	1,028	1,205	9,893
North Eastern	3,283	1,926	4,678	44	9,931
Rural	3,307	1,250	2,534	1,418	8,508
Urban	11,266	2,456	462	110	14,295
National Average	4,941	1,497	2,108	1,149	9,696

Source: Kenya 2001

On average, most Kenyans spend their earnings on consumables, mainly food, and this trend dominates urban and rural expenditure patterns. At the provincial level, however, North Eastern has the highest average expenditure on food, followed by Nairobi and Coast provinces (see Table 2.3 below). Nevertheless, the rural parts of the country report the lowest monetary expenditures and this is particularly significant with regard to durable expenses. We expect that investments such as communications services will be governed by how much money is available and the level of competing demands for the same resources at the household level.

Table 2.3: Mean Monthly Household Expenditure by Broad Categories by Province (KShs)

Province/Area	Education	Medical	Food	Own Crop	Non-Food	Durable Expenses	Total Expenditure
Nairobi	538	1,042	6,665	4	6,110	715	15,075
Western	349	293	3,463	822	787	22	5,736
Nyanza	208	359	3,499	909	1,028	55	6,058
Rift Valley	245	312	3,588	1,887	1,477	76	7,585
Central	200	180	3,785	940	1,330	172	6,609
Eastern	192	210	3,050	734	1,242	33	5,460
Coast	174	253	4,798	583	1,493	28	7,328
North Eastern	130	206	6,724	174	2,485	9	9,727
Rural	215	250	3,554	1,190	1,095	60	6,365
Urban	409	725	5,523	138	4,187	392	11,374
National Average	255	347	3,958	974	1,730	128	7,393

Source: Kenya 2001

Kenya has a very high proportion of young people (see Table 2.4 below). Overall, the population aged below 20 years accounts for 56% of the total; this population is disproportionately represented amongst the poor (Kenya 2000). Having a dominantly young population has implications for what becomes popular consumption. What however complicates this is that many of these young people are poor and their desires may therefore not match what they are able to afford. If the majority of Kenyans are both young and poor they may not be in a position to enjoy unrestricted access to certain consumables including communications services. The question therefore is: How best do we reach this particular category of the Kenyan population?

Table 2.4: Total Population by Age

Age Group	Number	Percentage
0 – 4	3,419,474	13.5
5 – 9	3,867,484	15.3
10 – 14	4,608,601	18.3
15 – 19	2,243,458	8.9
20 – 24	2,142,939	8.5
25 – 29	1,718,483	6.8
30 – 34	1,446,219	5.7
35 – 39	1,402,440	5.6
40 – 44	1,051,237	4.2
45 – 49	935,837	3.7
50 – 54	660,773	2.6
55 – 59	503,508	2.0
60 – 64	385,916	1.5
65+	857,855	3.4
Total	25,244,223	100

Source: Kenya 2000

The elderly people are another equally excluded segment of the Kenyan population. According to the 1999 Census, there are over 1.8 million people in the age category of 55 years and above; two fifths of these live in the rural areas of

the country (see Table 2.5 below). Potential demand and actual availability of communications services in rural Kenya therefore will no doubt depend on the somewhat unique needs of this category of the country's population. Generally, most of the people within this category are either retired or are engaged in economic activities that require paying attention to resource allocation. It will therefore be interesting to find out how this group responds to accessing communications and whether their needs are unique from those of the youth.

Table 2.5: Number of people aged 55 years and above by gender

Age bracket	Male	Female	Total
55 – 59	223,691	236,325	460,016
60 – 64	194,513	214,715	409,228
65 – 69	140,969	160,364	301,033
70 – 74	118,601	135,524	254,125
75 – 79	79,166	81,620	160,786
80+	95,300	121,038	216,338
Total	852,240	949,586	1,801,826

Source: Kenya Statistical Abstracts 2001

The percentage of the population that has never attended school is one of the crucial indices in determining use or non-use of communications services. This is particularly significant given that as per the 1999 Census, 18% of the national population had never attended formal schooling and a large proportion of this were rural dwellers (see Table 2.6 below). In terms of gender disparities, more women (88%) than men (62%) did not attend school. Nyanza Province recorded the highest gender inequality ratio (279) while North Eastern recorded the lowest (100). Similarly, the number of women who never attended school was higher in the rural areas than in the urban centres (CBS 2002).

Table 2.6: The percentage of population that never attended school by age and gender

Age Group	Female	Male	Average Total
6 – 9	17.7	18.0	17.8
10 – 14	11.2	10.6	10.9
15 – 19	11.0	9.5	10.2
20 – 24	11.7	9.2	10.6
25 – 29	15.1	9.7	12.6
30+	46.6	24.7	36.5
Total	24.5	16.2	20.5

Source: CBS 2001

Evidently, Kenya's demographic characteristics present an interesting scenario in discussions covering the supply of and demand for communication services. That the country's population is young with a substantial number of it being poor, rural based and often illiterate presents a challenge to the goal of UA to communications services.

2.1.5 Poverty Levels and Economic Activities

According to the 1997 Welfare Monitoring Survey, almost one in every two Kenyans is poor with three quarters of Kenyans living in the rural areas of the country (Kenya 2001). Subsistence farmers (47%) and farmers engaged in food crop production (46%) have the highest proportions of poor people as compared to groups engaged within the public (16%) or private (31%) sectors (Ikiara 1999, p.306). In spite of this, most poverty-reduction interventions have not managed to bring an end to poverty and its manifestations (Omosa 2002). One of the main constraints is the elusive nature of poverty. Key poverty ingredients however include the state of insufficient income necessary to secure the necessities of life and the denial of opportunities and choices most basic to human development (UNDP, 2001). In monetary terms, absolute poverty in Kenya is pegged at KShs. 1,239 per person per month in the rural areas and KShs. 2,648 per person per month in the urban areas (Kenya 1997). It is, however, rightly acknowledged that people define, view and experience poverty in different ways. Moreover, movement in and out of poverty makes targeting even more challenging.

Generally, poverty levels have been on the increase in Kenya. For example, the Human Poverty Index (HPI)⁷ rose from 26% in 1997 to about 35% in 2001. Regionally, the most affected areas include North Eastern, Nyanza, Western, and Eastern provinces (see Table 2.7 below). Central Province has the lowest human poverty value—ahead of even cosmopolitan Nairobi. The assumption therefore is that these regions will exhibit different consumption patterns.

Table 2.7: The extent of human poverty in Kenya

Province	Human Poverty (%)	Affected Population
North Eastern	44.8	431,040
Nyanza	44.3	1,945,742
Western	41.1	1,380,456
Eastern	39.9	1,848,079
Coast	37.5	932,724
Rift Valley	36.8	2,571,229
Nairobi	32.4	694,414
Central	30.7	1,143,316
Total	34.5	9,896,879

Source: UNDP, 2001

Women are perceived as more vulnerable to poverty than their male counterparts. For instance, 69% of the active female population in Kenya works as subsistence farmers as compared to only 43% of the active male population. Furthermore, only 25% of the adult women population is engaged in formal employment as compared to over 40% of the adult male population (Kenya 2001,

⁷ HPI refers to the Human Poverty Index

p.16). And, according to a 1994 Kenya Poverty Assessment Survey, 44% of the female-headed households categorised themselves as poor, compared to only 20% of the male-headed households (Kariuki & King'oo 1998, p.46).

A general overview shows that rural livelihoods are dependent on agriculture, livestock, and micro and small enterprises (MSEs). Indeed in 1999, close to 66% of Kenya's MSEs were in the rural areas (see Table 2.8 below), and 82% of the MSEs were reported having no telephone access (Statistical Abstracts 2001).

Table 2.8: Distribution of MSEs and Employment Numbers

Location	MSEs		Workers	
	Number	%	Number	%
Nairobi & Mombasa	204,280	15.8	394,838	16.9
Other Major Towns	157,533	12.2	279,133	11.8
Rural Towns	81,320	6.3	135,349	5.6
Rural Areas	845,879	65.6	1,551,930	65.7
Total	1,289,012	100	2,361,250	100

Source: National Baseline Survey, 1999

2.1.6 Economic Performance

The country's performance has not been in line with its potential. Compared to the first post-independence decade, Kenya performed poorly in both the 1980s and the 1990s. This performance became negative in 2000. Some key performance statistics are:

- GDP growth was negative 0.2% in 2000, a modest 1.2% in 2001 and a lower 1.1% in 2002 (Economic Survey, 2002 and 2003).
- GDP per capita (2000) is US\$ 360 (World Telecommunication Development Report 2002). Income levels vary greatly from region to region.
- Agriculture and manufacturing sectors, which contribute one third of the GDP, grew by 1.2% and 0.8%, respectively, in 2001 and 0.7% and 1.2% respectively, in 2002. Apart from manufacturing, building and construction, trade, and restaurants and hotels, all other sectors recorded lower real GDP growth rates in 2002 than in 2001 (Economic Survey, 2003)
- The percentage of the population living below the national poverty line has increased from 48% in 1990 to 56% in 2001 (Economic Recovery Strategy for Wealth and Employment Creation, 2003-2007).

Kenya's rural economy is dominated by the agricultural sector. Although agriculture accounts for only 20% of the GDP, it employs 75% of the country's labour force. It is important to note that over 51% of the rural labour force is engaged in small-scale agriculture and that women are the majority in the sector. Indeed, agriculture accounts for 90% of rural incomes (see Kenya Human

Development Report 2001). Agriculture accounts for only 9% of the total private and public sector earnings in Kenya, however. This example demonstrates that urban areas account for a very large proportion of national income and conversely rural areas account for very little in terms of the national income.

The differences between urban and rural areas are not restricted to incomes. There are huge inequalities in education, health, HIV/AIDS, living conditions, transport and communications and environment (see Kenya Human Development Report 2001). These serious regional differences within Kenya combine with the great strides being made in telecommunications development in the more populous areas to make the formulation of a workable UA strategy and implementation plan of vital importance to the country's socio-economic and regional development.

Communications is one of the most important sub-sectors in Kenya's economy. The transport, storage and communications sector registered the highest growth in 2001 (Economic Survey 2002). The fast-growing mobile communications is one of the main forces behind the 21.5% increase in the value of output of the transport, storage and communications sector in 2002. The communications sub-sector increased its output by 28.3% in 2002 in comparison to 2001 (Economic Survey 2003). It is anticipated that this sub-sector will continue to grow, especially with the end of Telkom Kenya's monopoly and with further liberalization of the sector from 30 June 2004.

2.2 National Economic Strategy

2.2.1 Status of ICT Plans

In general, the government has recognized the role of ICT in national development and the need to develop a national ICT policy that will act as a catalyst for responsive and growth-enhancing ICT sector for the benefit of all Kenyans. The government's economic blue print (Economic Recovery Strategy for Wealth and Employment Creation, 2003-2007), for example, recognizes that the ICT sector "is important to the realization of the required improvement in productivity and empowerment of the citizenry".

As part of the liberalization process, the government intended to sell 49% of TKL to enable TKL achieve increased growth. However, this move has failed for a number of reasons. According to the Economic Recovery Strategy for Wealth and Employment Creation, the government still aims at restructuring TKL in readiness for privatization in 2004. Other restructuring actions and their status that the current government intends to achieve in order to increase competition and lower costs in the telecommunications sector are summarized in Table 2.9 below.

Table 2.9: Status of the Government's Interventions on the Communications Sector

Planned Interventions	Planned Timeframe	Status	Comments
Establish an Inter-Ministerial Committee to mainstream ICT in the government's operations	No timeframe	The Committee has been established. Its key function is to oversee the implementation of e-government strategy, which now has been developed. It is however not clear whether this Committee is operational as at September 2004	Only the structures for development and implementation of e-government have been created. Structures for the national ICT have not been created. Perhaps the current structures which are not harmonized will continue to operate for some time
Mainstream ICT into the government's operations		Some equipment purchased	There is poor ICT infrastructure, including hardly any applications, and lack of an ICT policy
Invest in adequate ICT education and training, especially mainstream ICT into education curriculum	No timeframe	No known actions have been taken	
Implement integrated financial management information system (IFMIS)		On-going but behind schedule	Local area networks do not exist in many ministries and there is resistance from staff
Tax reduction on ICT		Tax on computers removed but tax on other categories of ICT still in force	
Operationalize ICT policy		Official ICT policy has not been released	Several drafts have been circulating and there has been limited involvement of stakeholders in the development process
Privatize Telkom Kenya Ltd.	2003-2005	No known actions have been taken yet, including significant restructuring and the enactment of the Privatisation Bill	It is understood that the government committed itself to privatisation in the February 2004 International Investment Conference
License a third mobile operator	2003-2004	Work on this started in 2003 but the licensing process has been protracted by law suits and internal wrangling amongst the partners. The winning bidder (Econet Wireless) was given a timeframe within which to pay the licence fee. This timeframe expires on in October 2004	The licensing process is yet to be finalized. It will be interesting to see whether Econet Wireless pays for the licence in time and what happens if it does not.
License a second national fixed line operator	2003-2004	The licensing process has been protracted by alleged government's interference and law suits	The Public Procurement Complaints Review and Appeals Board ruled that CCK invites fresh bids. This however may be complicated by the fact that there is still a court case filed by one of the competitors and that CCK adopted an open-market

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Planned Interventions	Planned Timeframe	Status	Comments
			licensing framework in September, 2004
License four Internet gateway service operators	2003-2004	10 Internet backbone and gateway operators were gazetted for licensing on 3 September 2004	CCK adopted a new licensing framework at the end of TKL's exclusivity period
Fully liberalize the use of VSAT services	2003-2004	Two commercial VSAT operators were gazetted for licensing on 3 September 2004	The new licensing framework allows licensing of VSAT operators on a first come first served basis and for the operators to carry any form of multi-media traffic, including VoIP
License at least 10 national data carriers	Not stated, but June 2004 assumed	Nine Public Data Network Operator (PDNO) licenses have been issued	The new licensing framework allows licensing of PDNOs on a first-come-first-served basis and for the operators to establish international gateways for data and to carry any form of multi-media traffic, including VoIP
Develop and implement an e-government policy	June 2004	The e-government strategy was produced in March 2004	The e-government strategy seems to be ahead of the national ICT policy, creating possibilities of a mismatch. Very little had been implemented as at September 2004, however
Fully liberalize the air waves	2003-2004	The liberalization has continued	A drafts broadcasting policy and a draft broadcasting bill were shelved when communications and information came together to form a new ministry
Improve the legal framework for the media and broadcasting sectors	No timeframe	No known actions have been taken	A drafts broadcasting policy and a draft broadcasting bill were both shelved when communications and information came together to form a new Ministry
Review policy on vernacular services to ensure the services fully exploit the existing potential in community broadcasting	No timeframe	No known actions have been taken	A drafts broadcasting policy and a draft broadcasting bill were both shelved when communications and information came together to form a new Ministry
Implement a well targeted tax reduction and/or tax incentives on computer software and hardware to make them affordable to micro-enterprises and low-income earners	No timeframe	Duties on computers removed	Duties on software, telecommunications and other ICT items still exist
Review the legal framework to remove	No timeframe	No known actions have been taken	

Planned Interventions	Planned Timeframe	Status	Comments
impediments that have discouraged adoption and use of e-commerce			

Source: ERS and daily newspapers

The planned liberalization, if implemented, will to some extent promote UA. This project however remains critical in extending services to the rural areas.

2.2.2 Other Interventions Pertinent to Universal Access

The following is a summary of the key interventions that are pertinent to UA that the government has promised to fulfil as per the ERS:

a) Macroeconomic framework

- create 500,000 jobs annually
- reduce poverty level by at least 5% from the current 56.8%
- achieve a high GDP growth rate—rising from 1.1% in 2002 to 2.3% in 2003 and 7% in 2006
- increase domestic savings so as to enable higher levels of investment for sustainable development

b) Infrastructure

- accelerate the implementation of the *Roads 2000 Programme* by 2004, which involves development of rural access roads which will help the poor by improving their mobility
- integrate IT network between Kenya Ports Authority (KPA), Kenya Revenue Authority (KRA), Kenya Railways Corporation (KRC) and other port users in order to facilitate and shorten the period of processing documents, from the current two to four days to one day. The intention is to make Mombasa an e-port and eliminate/reduce the large number of documentation required
- create a specific statutory body to implement the rural electrification programme with the aim of enhancing connectivity to at least 40%
- amend the Electric Power Act to facilitate competition at all levels of generation, supply, and distribution by 2003-2004
- diversify power supply sources by accessing RSA pool and enhancing imports from Uganda by 2006
- complete Sondu-Miriu power project and make deliberate efforts to extend electricity services to rural areas and targeted urban areas to increase accessibility to both the rural population and the urban poor by 2003-2004

c) Agriculture⁸

- make financial services more accessible to rural communities and improve marketing services

⁸ Partly from Strategy for Revitalizing Agriculture, 2004-2014, Ministries of Agriculture and Livestock and Fisheries Development, March 2004

- review and rationalize all taxes, cess, fees and other levies charged on agriculture by local authorities and the central government
- explore the possibility of moving away from the taxation in form of duties and levies on agricultural produce to taxing income
- provide tax incentives to encourage agri-business development in the rural areas, including waiving taxes and levies on power
- promote rural refineries and strengthen quality control in 2003-2007 in order to exploit the potential for honey and bee products
- re-establish the Cotton Board and clear outstanding debts, rehabilitate and expand irrigation schemes and take advantage of the American Growth Opportunity for Africa (AGOA) and European Union (EU) initiatives in 2003-2007 to revamp growth in the cotton industry and reduce the cost of cotton production
- restructure the public extension service system to become Agricultural Advisory Service that is lean at the national level and devolved to district and location levels
- develop micro-finance institutions for the agricultural sector in 2003-2006 to increase smallholders' access to credit

d) Trade and Industry

- improve the investment environment in 2003 by putting in place an Investment Code that consolidates into one parliamentary act all incentives, property rights' protection and institutional arrangements to reduce the red tape and cost of bureaucracy; the Code will provide for the creation of a one-stop Investment Authority
- computerize the entire of investment-related offices, including the immigration, customs, security vetting services, lands office and Registrar of Companies to ensure that investors and the Investment Authority have real-time access to relevant data and information
- identify suitable zones (through local authorities) with basic infrastructure which will serve as incubators for MSEs
- complete the Sessional Paper on MSEs in 2003-2004 with a focus on employment creation and poverty reduction
- formulate a comprehensive fisheries policy and institutional capacity building in 2003-2007 to, among others, lead to increased income for fisher families
- establish export processing villages (EPV) for smallholder producers in 2004-2007 as part of implementing a trade policy that promotes regional and domestic trade and takes advantage of NEPAD opportunities and leads to increased micro enterprises exports

e) Health

- set up special health care endowment fund in 2003-2007 (as part of setting up the National Social Health Insurance Fund [NSHIF]) to target vulnerable groups, for instance the aged, the disabled and other deserving persons
- rehabilitate existing health facilities in 2003-2007
- train communities on HIV/AIDS home-based care by 2006 to reduce the prevalence of HIV/AIDS
- implement the HIV/AIDS curriculum in all schools

f) Arid and Semi-arid Lands

- provide adequate water for range-lands by sinking boreholes and constructing dams at strategic locations in the region
- develop support infrastructure, including roads and stock routes with water facilities

- allocate a larger portion of the revenues generated from game reserves and national parks to community projects
- improve infrastructure in 2003-2007, especially the road network and telecommunication system to facilitate the free movement and exchange of goods and services
- facilitate the establishment of livestock-based industries in pastoral areas
- offer appropriate investment incentives for private investors targeting ASALs
- Strengthen community-based health care programmes and promote mobile outreach clinics for remote areas in 2003-2007

Very little however has been achieved in implementing the above interventions. This is the case with most of the elements of the implementation matrix in the ERS. Perhaps with the creation of the Economic and Social Council⁹ (see Special Kenya Gazette for 21 September, 2004), there will be renewed zeal to implement, monitor and evaluate the action plan contained in the ERS.

2.3 Summary of Key Opportunities and Challenges

From the above review of the national context, the following are the key opportunities and challenges with respect to communication services and rural areas.

a) Opportunities

- the intention by the government to carry out a wide range of interventions in ICT

b) Challenges

- low income levels and high levels of poverty
- large proportion of the population is illiterate
- high proportion of the population is young
- slow economic growth
- limited support physical infrastructure, especially electricity and roads

⁹ The National Economic and Social Council's (NESC) mandate is to (a) create a forum in which the government, the private sector and the labour unions can discuss and identify policy issues and recommend to the government for implementation of such issues, (b) gather, analyse and compile information on economic development and trends and submit such information to the Cabinet with appropriate recommendations, (c) appraise and evaluate the success of various programmes and activities of the government, including the Economic Recovery Investment programme, (d) develop and recommend to the cabinet coordinated policies that will promote social equity economic growth, create employment and reduce poverty and inequality, (e) recommend and make suggestions on key areas as sought by the government, the private sector or the civil society, (f) enhance prioritizing by identifying the most critical social and economic areas that could in turn fuel economic growth and job creation, thus reducing poverty, (g) make better use of the private and civil society sectors to improve on economic planning, and (h) consult higher institutions and research bodies for efficient planning.

3. Communications Sector Review

Policy and Regulation

The policy remains the responsibility of the government. The KCA 1998 established the National Communication Secretariat (NCS), headed by a Communication Secretary, whose main objective is to **advise the government on the adoption of a communication policy**, which among other things encourages competition and efficiency in the provision of communication services and fosters full and efficient use of telecommunication resources, including effective use of the radio spectrum.

The **CCK** is an independent regulator whose objectives are **to licence and regulate telecommunications, radio communication and postal services**. The CCK's **vision** is to **"enable access to reliable communications services by all Kenyans"**, while its **mission** is to **"ensure that the communications sector contributes to the country's overall development through efficient and enabling regulation and public participation"**. More details on CCK can be found in its website (<http://www.cck.go.ke>).

It is not clear which arm of the government deals with matters relating to IT. At the same time, there is no regulator for the IT sub-sector. Obviously CCK regulates some aspects of the IT sector.

Given the convergence of telecommunications, broadcasting and IT, it is expected that the responsibilities for policy and regulation for these sub-sectors will lay squarely on the new Ministry of Information and Communication. With convergence, for example, it is reasonable to expect that one independent regulator regulates telecommunications, postal, broadcasting and IT. By making broadcasting regulation as part of its mandate, the CCK would thus be responsible for, among other functions, the licensing and the assignment of broadcasting frequencies, the regulation of ownership of stations (including content regulation), and the enforcement of fair competition practices.

Given the convergence, it is similarly reasonable to expect that all policy matters in telecommunications, postal, broadcasting and IT are brought under one roof. The government has created a structure on e-government that is in another ministry, the Office of the President. Other than the coming together of Information and Communications in one ministry, hardly anything else has changed. The state of affairs where ICT responsibilities were distributed in different arms of the government¹⁰, with little, if any, coordination prevails. This situation has to change if

¹⁰ The Ministry of Information and Communication (MoIC) has the CCK, NCS, TKL and PCK (the last two are parastatals in the Ministry), the Ministry of Finance has the Government IT Services (GITS) in charge of ICT in the government, the Office of the President has the Directorate of e-Government in charge of e-government and

Kenya is to harness the potential of the whole spectrum of ICT for national socio-economic development and to exploit the inherent synergies in the sub-sectors.

National ICT Policy

In December 2001, the government, through the Minister for Transport and Communications, issued the Telecommunications and Postal Sector Policy Guidelines. The objectives and targets of this policy statement are:

1. The overall government's objective for the sector is *to optimize its contribution to the development of the Kenyan economy as a whole by ensuring the availability of efficient, reliable and affordable communication services throughout the country. In the area of telecommunications services for instance, it is intended:*
 - (a) *To improve penetration in the rural areas from the present 0.16 lines to 5 lines per 100 people by the year 2015.*
 - (b) *To improve service penetration in urban areas from the present 4 lines to 20 lines per 100 people by the year 2015.*
2. In the area of postal services, it is observed that the network is already fairly extensive. The main objective, therefore, will be *to ensure high quality service, cost effective expansion and financial self-sustenance.*

With respect to UA, the policy statement has provided in Part 3.4.1, the following:

The government will continue to emphasize the provision of basic postal and telecommunication services to all unserved or under-served areas at affordable rates. All players will be expected to contribute towards this goal. Appropriate regulations and licensing procedures will be put into place to ensure compliance. However, where the provision of such services is deemed to be uneconomical, the government will undertake to avail appropriate subventions.

The UA objectives and targets set out in the official policy above are out of line with the prevailing circumstances. Targets, for example, are only set for fixed telephone lines; the policy does not address mobile telephones. Given that the mobile telephone penetration is about seven times that of fixed telephone lines (see sub-section 3.4 below), this indeed is a very serious omission. At the same time, a significant part of the rural areas has a mobile telephone signal yet the rural people do not make use of the communication services. This may signal that part of the problem is not on the supply side, which is the major underlying assumption of the policy position summarized above. Further, very little has been achieved towards realizing the set targets. It therefore means that the mechanisms that have been put in place to implement the policy, for example, the liberalization of fixed telecommunication services, have not worked as expected.

the Ministry of Education, Science and Technology (MoEST) has the Technical Training Department and the National Council for Science and Technology. All these arms have varying mandates over ICT.

For more than a year, the government has been developing a national ICT policy¹¹. This document has remained confidential, however, circulating within the government's offices, with the rest of the stakeholders having no access to it. Unfortunately, the document has never been finalized, like others that have preceded it. When the new Ministry of Information and Communication was created in mid-2004, the new Minister rejected the draft national ICT policy and both the national broadcasting policy and the broadcasting bill. The industry is anxiously waiting for a way forward. It makes sense that the new policy takes into account telecommunications, postal, broadcasting and IT services.

With respect to UA, this report contains many issues that have policy implications. It is reasonable to assume that the recommendations of this report will be taken into account in the new policy. The government has in the past given assurances that the national ICT policy will be amended to incorporate the recommendations of this study. In any case, policies are a dynamic phenomenon, which should change as circumstances change.

In March 2004, the government released the e-government strategy. The Cabinet Office in the Office of the President developed this strategy. The objectives of the e-government strategy are to enhance the transparency, accountability and good governance of the government, make the government more result oriented, efficient and citizen centered, and enable citizens and businesses to access the government's services and information as efficiently and as effectively as possible through the use of ICT. The strategy release, which includes a detailed and ambitious implementation plan, signalled the readiness to implement ICT in the government. Whilst this is a welcome initiative, it nevertheless demonstrates the government's ad-hoc approach to ICT policy and strategy development and implementation. It would have been more appropriate if the e-government strategy were being implemented within a defined national ICT policy framework. The following, for example, has compromised the ability for a successful rollout of the e-government strategy:

- Lack of an ICT human resource development strategy; that the ICT technical and managerial capacity in the government is highly inadequate worsens this.
- There is no change management strategy. The government has no capacity to manage the change brought about by ICT unless there is a well-defined change management strategy.

¹¹ This is not the first time the government has attempted to develop a national ICT policy. Efforts have been expended to this end starting in the 1980s but unfortunately no final output has ever been finalized. The reasons for this are beyond the scope of this study.

- The sources of the financial resources to implement the strategy have not been defined.

In the long term (beyond 2007), the e-government strategy aims at creating a common framework for a cost-effective delivery of e-government services to the citizens and business and between government departments. Although this will have implications for the provision of ICT services in the rural areas, the strategy is not clear how citizens, especially in the rural areas, would have access to e-government services.

Communications Sector Reform

The Kenya Posts and Telecommunications Corporation (KP&TC), the precursor to the current public licensees in the telecommunications and postal sectors, was an offshoot of the East African Posts and Telecommunications Corporation (EAP&TC). EAP&TC had been formed during the late 1960s as a common infrastructure carrier in line with the then the East African Community (EAC). KP&TC was a state monopoly over telecommunications and postal services.

The first policy statement specific to telecommunications and postal sector liberalisation was issued in 1997. This culminated in the KCA 1998 and the Postal Corporation Act, 1998. The KCA 1998, which replaced the Kenya Posts and Telecommunications Corporation Act (Cap 411), came into effect on 1 July 1999. As a result of these Acts, the KP&TC was split into three separate entities: TKL, the Postal Corporation of Kenya (PCK), and the CCK. At the same time, a National Communications Secretariat was established within the Ministry of Information, Transport and Communications, to serve as the policy advisory arm of the government on matters relating to the communications sector, while an Appeals Tribunal serves as the independent arbitrator.

As part of the post-exclusivity regulatory strategy, the Director General of the CCK issued a statement in September 2004 containing a new licensing framework. The general goal of this framework is "to ensure that the regulatory environment in the sector is friendly to investment and conducive to the provision of modern communication services". The specific objectives of the new licensing framework are to ensure that Kenya has:

- a more dynamic and competitive ICT environment
- improved access to ICT infrastructure and services
- choice in the provision of communication services to meet socio-economic needs of the society

The new licensing framework will:

- allow cellular mobile operators to construct and operate their own international gateways if they choose to do so; this was largely necessitated by the need for diversity in international links, high traffic volumes, need to expand and better manager roaming services, and so on
- provide for the licensing of additional Internet backbone and gateway operators, broadcasting signal distributors and commercial VSAT operators on a first-come-first-served basis
- allow PDNOs to establish international gateways for data communications services
- allow Internet backbone and gateway operators, broadcast signal distributors, commercial VSAT operators and PDNOs to carry any form of multimedia traffic, for example, VoIP

One notable aspect of the new licensing framework is that the CCK is abandoning licensing based on a bidding process in favour of open market-based licensing. The CCK argues that licensing through a bidding process, especially in a liberalized market, is “not only unnecessary but undesirable and inconsistent with market dynamics”. The problems of using the bidding process were evident in the licensing of rural telecommunications operators (RTOs), commercial trunked radio operators (CTROs) and the third GSM operator.

The post-exclusivity statement by CCK’s Director General in September 2004 states that in the medium to long term, CCK “shall adopt a unified and absolute technology neutral licensing framework that permits any form of communications infrastructure to be used to provide any type of communications service that is technically capable of providing”. It goes further to suggest that in the next two to five years, the market structure, largely driven by technological convergence, will be technology neutral with the following categories:

- Network Facilities Providers (NFPs)--to own and operate any form of communications infrastructure
- Applications Service Providers (ASPs)--to provide all forms of services to end users using the network services of a NFP
- Contents Service Providers (CSPs)—to provide content services, for example, broadcasting material and information services

The new licensing framework is likely to lead to reduced costs of communication, broader choice of service providers, more rapid rollout and more widespread coverage by operators, and better and more reliable services. This may in turn lead to a better penetration of communication services in the rural areas. Specifically, operators who considered using their equipment to provide only one licensed service in the rural areas as unprofitable may now find rural operations are more profitable, for example, public data network operators can now use the

same equipment to provide voice services, in addition to data services, in the rural areas.

The sector liberalization as implemented by the CCK implementation has significantly changed the communications sub-sector in the country. A summary of what has been achieved with the liberalization initiatives is shown in Table 3.1 below:

Table 3.1: Licensed Operators

Type of Operators/Services	Licensed Operators
Fixed line operators	TKL (a national operator) ¹²
	Bell Western Ltd. (a regional operator)
Mobile operators	Kencell Communications Ltd
	Safaricom Ltd. ¹³
	3 rd mobile operator licensing not yet completed
Internet backbone operators	TKL
	10 were gazetted on 3 September 2004 for licensing
Public data network operators	Six operators, including TKL
Internet Service Providers	78 licensed--fewer than half are operational
Internet Exchange Point Providers	Two
Local loop operators	Four licensed
	Two were gazetted on September 3, 2004 for licensing
GMPCS service providers	One was gazetted on 3 September 2004 for licensing. Does anyone else provide these services??
VAS-premium service providers	17 One was gazetted on 3 September 2004 for licensing
National commercial VSAT operators	TKL
	Alldean Satellite network (Kenya) Ltd.
	Two were gazetted on 3 September 2004 for licensing
Postal operators	PCK
Private courier operators	74 licensed
Broadcasting--TV and	12 television broadcasters

¹² The licensing of a second national operator (SNO) started in 2003/2004 with a view to issuing a license after the end of TKL's exclusivity period on 30 June 2004. This process however has been delayed by legal suits and the government's interference. It is not clear how the licensing process will proceed given a pending legal suit and a change in the licensing framework as outlined in section 2.

¹³ The licensing of a third mobile operator started in 2002/2003. The licensing has been delayed by a number of factors, including internal wrangling between partners and legal suits. The CCK expects to grant a licence in 2004/2005 and thereafter the operator is expected to begin service rollout.

Type of Operators/Services	Licensed Operators
Radio ¹⁴	<ul style="list-style-type: none"> ▪ 28 radio broadcasters but only 21 on air as at November 2003

Source: CCK

Overview of Performance in Communications

Telephone Network Services

Fixed Telephone Network Services

The performance of fixed telephone network services, including performance in the rural areas, and TKL's rollout obligations over the last five years are summarized in tables 3.2 and 3.3 below, respectively.

Table 3.2: Summary of Fixed Telephone Network Performance

Year	Exchange Capacity	Subscriber Connections	Waiters	Pay-Phones	Lines in the Rural Areas	% of Lines in the Rural Areas
1999/2000	420,370	296,400	>100,000	9,000	14,779	5.0%
2000/2001	446,302	321,482	111,866	9,135	17,486	5.4%
2001/2002	490,000	328,116	134,290	9,264	18,238	5.6%
2002/2003	508,230	328,358	130,829	9,964	19,288	5.9%
2003/2004	531,442	299,255	> 117,298	9,798	NA	NA

Source: CCK

NA – Not Available

Table 3.3: TKL's Rollout Obligations for New Lines and Payphones

Year No.	Actual Year	New Urban Lines	New Rural Lines	Total New Lines	New Payphones
1 st	2000	20,000	5,000	25,000	2,500
2 nd	2001	55,000	5,000	60,000	5,000
3 rd	2002	70,000	5,000	75,000	5,000
4 th	2003	70,000	5,000	75,000	5,000
5 th	2004	70,000	5,000	75,000	5,000
Total		285,000	25,000	310,000	22,500

Source: CCK

In addition, fixed telephone lines in the country have been based largely in the urban areas, with Nairobi having the highest teledensity. By 2003, Nairobi had 56% of the subscribers while the remaining 44% subscribers are distributed in the other provinces as follows: Coast (13%), Rift Valley (12%), Western (2%), Nyanza (4%),

¹⁴ CCK does not license broadcasters – it only allocates the frequencies for approved broadcasters.

Eastern (5%), North Eastern (1%) and Central (7%) (CCK's Annual Report, 2003/2004).

With respect to public payphones, the number has increased from 588 in 1981 to about 10,000 (less than 3% of the main lines) by 2004, with very little increase in the last five years. Again as in the fixed telephone lines, the distribution of public pay phones is skewed towards urban areas, with Nairobi having a disproportionate share of the total (over 20%).

In summary, the following points can be made:

- **Exchange capacity and subscriber connections.** The exchange capacity has grown steadily, albeit at a very low rate. In comparison, subscriber connections have hardly changed in the last five years; indeed, they went down between 2003 and 2004. This may be attributed to preference for mobile telephones over fixed telephones; very limited availability of long-term funds to invest due to delays in privatizing TKL; poor customer service, including billing problems; and so on.
- **Waiters.** At over 100,000, the number of waiters has remained fairly constant over the period. The unmet demand however is likely higher than this given that customers are unlikely to apply for telephones given their knowledge of TKL's poor delivery of services.
- **Payphones.** These have remained less than 10,000. The increase every year has been less than 500 against an annual licence of 5,000. Indeed, between 2003 and 2004, the number of payphones went down slightly. Given that payphones are vital in enhancing access to telecommunication services by the majority of ordinary Kenyans, this has enormous negative implications for UA to telecommunication services.
- **Telephone connections rollout obligations.** TKL failed to meet its rollout obligations for telephone connections. This made it liable for a fine as per its licence conditions. The CCK therefore fined TKL for its inability to meet the first three-year rollout obligations. A fine of KShs. 58 million (less than US\$ 1m) is far less than the amount it would cost TKL to rollout the additional lines called for by its licence (Kane, 2002).
- **Payphone rollout obligations.** TKL failed to meet its rollout obligations for payphones by a large margin. The fine mentioned in the previous paragraph included the missed targets for payphones.
- **Lines in the rural areas.** The number of telephone lines in the rural areas is negligible, typically about 5% of the total. Given that about 80% of the population lives in the rural areas, this trend needs to be reversed, using the recommendations contained in this report.

Mobile Telephone Network Services

Mobile telephony was first introduced in Kenya in 1992, and the technology has moved from the initial External Total Access Communications Systems (ETACS) to the second and third generation of Global Mobile Systems (GSM).

The mobile cellular phone market is currently operating a duopoly with two service providers;

- SafariCom Limited, a joint venture between TKL owning 60% and Vodafone UK owning 40%
- Kencell Communications Limited, a joint venture with Celtel International¹⁵ owning about 60% and Vivendi Telecom International owning 40%

Safaricom was Kenya's first GSM operator and began offering services in 1997. Subscriber growth however did not take off until 2000 after a combination of factors, including the licensing of a competing GSM operator and the investment provided by Vodafone for network expansion. Kencell was the first licensed mobile operator and became the second GSM operator in January 2000. Even with this limited liberalization in the cellular mobile market, the impact has been far-reaching, especially with respect to mobile phone penetration. Table 3.4 below shows the performance of the two operators in this market over the last five years.

Table 3.4: Summary of Mobile Telephone Network Performance

Year	Safaricom capacity	Kencell capacity	Total capacity	Safaricom connections	Kencell connections	Total connections
1999/2000	NA	NA	24,000	54,000	60,000	23,757
2000/2001	NA	NA	640,000	325,235	259,896	340,731
2001/2002	NA	NA	1,220,000	728,163	458,959	944,128
2002/2003	1,500,000	NA	NA	1,000,000	590,785	1,590,785
2003/2004	2,935,000	1,000,000	3,935,000	1,627,378	918,779	2,546,157

Key: NA—Not Available

Source: CCK

With respect to obligations, the two mobile operators have over all the years performed well above their rollout obligations. In terms of coverage¹⁶, Safaricom's obligations are stated in terms of towns and highways and were to end in 2002. The coverage obligations of both operators are as shown in tables 3.5 and 3.6 below.

¹⁵ In 2003/2004, Vivendi International, a strategic partner with Sameer Limited of Kenya, sold its equity shareholding in Kencell to Celtel International. Celtel has presence in a number of African countries such as Uganda, the Democratic Republic of Congo, and Zambia.

¹⁶ Coverage in the licences of both operators is defined as signal availability and service availability in urban areas and within two kilometres of covered highways.

Table 3.5: Safaricom's Coverage Obligations

Phase	Coverage (Urban Areas and Interconnecting Highways)
Phase 1 (2000-2001)	<ul style="list-style-type: none"> ▪ Mombasa, Nairobi ▪ Greater Nairobi (Athi River, Ngong, Karuri, Kiambu, Thika, Ruiru, Limuru) ▪ Nakuru, Naivasha, Gilgil, Kisumu, Kericho, Eldoret, Kabarnet, Molo, Njoro, Magadi, Nairobi—Kisumu Highway ▪ Nyeri, Embu, Meru
Phase 2 (2001-2002)	<ul style="list-style-type: none"> ▪ Malindi, Nanyuki, Kitale, Kisii, Siaya, Busia, Bungoma, Kakamega, Webuye, Mumias, Voi, Nairobi—Mombasa Highway

Source: CCK

Table 3.6: Kencell's Coverage Obligations

Phase	Urban Areas coverage	Major Roadways and Railways
Phase 1 (March, 2000– October, 2000)	<ul style="list-style-type: none"> ▪ Greater Nairobi ▪ Mombasa 	<ul style="list-style-type: none"> ▪ Nairobi—Athi River Highway
Phase 2 (October, 2000— June, 2001)	<ul style="list-style-type: none"> ▪ Nyandarua ▪ Malindi, Kilifi, Kwale ▪ Kisumu, Nyamira ▪ Nakuru, Kericho, Eldoret, Uasin—Gishu 	<ul style="list-style-type: none"> ▪ Nairobi—Nakuru—Molo—Kericho—Kisumu Road and Railway ▪ Kisumu—Kakamega—Bungoma—Eldoret Road & Railway ▪ Nakuru—Eldoret—Kitale Road & Railway ▪ Vanga—Mombasa—Malindi Road ▪ Mombasa — Kwale Road
Phase 3 (July, 2001– December, 2001)	<ul style="list-style-type: none"> ▪ Tran—Nzoia, Kitale, Kabarnet, Baringo ▪ Narok ▪ Elgeyo Marakwet ▪ Bungoma ▪ Kakamega ▪ Busia ▪ Vihiga ▪ Maasai Mara 	<ul style="list-style-type: none"> ▪ Kakamega—Eldoret Road ▪ Nakuru—Kabarnet—Webuye Road ▪ Kisumu—Kisii—Homa Bay Road ▪ Kisumu—Busia Road
Phase 4 (January, 2002— June, 2002)	<ul style="list-style-type: none"> ▪ Thika, Kiambu, Nyeri, Kirinyaga ▪ Murang'a ▪ Meru, Embu ▪ Isiolo ▪ Tharaka Nithi ▪ Kajiado ▪ Nandi ▪ Mount Kenya National Park 	<ul style="list-style-type: none"> ▪ Nairobi—Thika Road ▪ Thika—Embu—Meru—Isiolo—Nanyuki—Nyeri—Thika road ▪ Around Mount Kenya Roads & Railways

Phase	Urban Areas coverage	Major Roadways and Railways
Phase 5 (June, 2002— December, 2002)	<ul style="list-style-type: none"> ▪ Voi, Lamu (VSAT)* ▪ Machakos, Kitui ▪ Garissa, Wajir (VSAT)* ▪ Kisii, Homa Bay, Siaya ▪ Amboseli, Tsavo West National Parks 	<ul style="list-style-type: none"> ▪ Nairobi—Voi—Mombasa Road & Railways ▪ Machakos—Kitui Road ▪ Nairobi—Kajiado—Namanga Road

*Coverage of these areas as specified is subject to Kencell being allowed to utilise the technology of their choice, for example, VSAT technology.

Source: CCK

By the end of 2002, Safaricom had covered all the areas as per their licence obligations. Indeed by June 2004, both operators had gone beyond the areas specified in their licences.

With respect to mobile payphones, Safaricom did not have any obligations. It nevertheless came up with a community payphone model, which actually places the burden of installation on business people. By March 2004, Safaricom's community phones numbered 2,141.

In comparison, Kencell was obligated to install 1,000 payphones by the end of 2003. The licence does not specify where the payphones are to be installed. By October 2003, the company had installed 814 unmanned payphones distributed in all the regions of the country. It had also been negotiating with the CCK to be allowed to adopt the Safaricom model of community phones instead of fixed payphones, citing such reasons as quick rollout, costs, and vandalism. By March 2004, the CCK had allowed Kencell to operate community phones (Simi Yetu). Thereafter, Kencell shifted its focus to community payphones. By June 2004, Kencell had over 2,000 community payphones (CCK's Annual Report, 2003/2004).

In summary, the following points can be noted:

-
- **Network growth.** The mobile network surpassed the fixed network in 2000/2001 and has since then experienced phenomenal growth. By 2003/2004, the mobile network was seven times the size of the fixed network. Although mobile services are more expensive than fixed services, many people have opted for this "premium" service. This may be attributed to the relative better customer service, the ease with which connections are obtained and the relative reliability of the mobile networks.
 - **Cost.** The introduction of competition has resulted in drastic reduction in connection charges and handset prices. By 2003/2004, for example, a low-end handset could retail at KShs. 1,000 to KShs. 2,000 in comparison to over KShs. 200,000 in 1999/2000. This has led to increased demand and usage of the service in rural and urban areas.
-

- **Coverage obligations.** The two operators exceeded both their rollout and coverage obligations. The quality of service performance however was below expectation as evidenced by frequent congestion and high call-drop rates.
 - **Community payphones.** Both operators have been rolling out community payphones. Although there is limited rollout of these payphones in the rural areas, they are one of the best ways of extending access to telephone and other services in the rural areas.
-

Postal/Courier Services

The KCA 1998 mandates the CCK to license and regulate postal/courier services in Kenya. This responsibility involves the issuance of licences to all operators, the regulation of tariffs for basic services, the enforcement of regulations to ensure compliance with licence conditions, and the creation of order in the postal/courier market.

The PCK, which was established by the Postal Corporation Act, 1998, is the public licensee for postal services. According to its licence from the CCK, its functions are:

- to provide postal services (letters and other postal items) in Kenya
- to carry out postal financial services
- to provide courier services, through EMS courier services

The communications policy has given the PCK, as the public licensee for postal services, exclusivity on the following services:

- delivery of letters with weights up to a maximum of 350 grammes,
- issuance of stamps and philatelic services
- provision of letter boxes

This policy does not however give a specific timeframe within which the PCK will retain monopoly over reserved services. It is important, as we move towards enhanced competition, that this exclusivity is reviewed. In addition, given that this project recommends mechanisms for funding UA to communication services, including universal postal services, it no longer makes sense to restrict competition on letters up to 350 grammes. In any case, compelling courier operators to charge at least five times the tariff of PCK goes against the spirit of affordability of services, which is critical for universal access. This also needs to be reviewed.

The PCK's rollout obligation for postal outlets in 2005 is 1,000, with each outlet covering 352 square kilometres and 20,000 people per outlet. Since the

liberalization of postal services in 1999, post office outlets have steadily declined from 1,036 to 872 in 2004. This has largely been attributed to the closure of non-commercial outlets countrywide as a result of commercialization. This trend of decline in postal outlets is likely to continue, given the need to make outlets more commercially viable, raising fears that the PCK may have difficulties meeting its rollout obligations.

The performance of the postal/courier sub-sector for the last six years is summarized in Table 3.7 below.

Table 3.7 Postal/Courier Sub-Sector Performance

	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
Post office outlets	1,036	909	900	891	890	872
Private letter boxes	343,601	351,441	388,281	394,121	397,731	395,811
Stamp vending licences	3,060	3,840	4,193	3,650	4,466	3,733
Private courier outlets	-	183	185	320	330	341
Licensed courier operators	-	21	40	52	63	74

Source: CCK

In spite of its wider network and dominance, the PCK continues to face competition from new entrants. These operators only operate on the most profitable areas¹⁷. Their competition on the courier market has led to notable decline in business transactions in mail and parcels handled. As noted above, this competition may have partly contributed to the decline in the number of post office outlets.

In 2003/2004, the PCK started providing Internet services through its Post Office outlets using VSAT throughout the country (Post Surf initiative). The government largely supported this initiative; as a result, 504 of the 872 outlets were connected. These outlets, many of which are in district headquarters¹⁸, can provide Internet services, including web browsing, e-mail and Internet fax. The PCK is using the VSAT infrastructure to provide voice communication between the connected post offices and plans to use the same infrastructure to offer e-government and money transfer services, among other services, to the public¹⁹. The use of VSAT to provide Internet and other services is one of the viable options to provide communication services in the rural areas.

¹⁷ Although Table 3.7 shows a number of licensed courier operators, a study by Strategic Business Options Ltd identified over 100 courier firms operating without a licence in various parts of the country. The CCK has identified most of them with a view to bringing them under its regulatory regime.

¹⁸ Some of the places where Internet has been provided via the Posta Surf initiative (including district headquarters) did not have Internet before as TKL's points of presence were not available.

¹⁹ This is subject to sorting out the regulatory issues involved.

Other Services

There was steady growth in other market segments as shown in Table 3.8 below.

Table 3.8: Performance of other Market Segments

Licence Category	Number of Licensees (Cumulative)				
	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
Vendors & Contractors	184	740	783	813	888
Technical personnel	30	71	108	139	182
Cyber Cafes/Telephone Bureau	-	-	-	51	70
Internet Service Providers	43	66	72	76	78
Internet Exchange Point Providers	-	-	1	2	2
Paging Service Providers	14	16	12	12	2
Value Added Service Providers	-	1	1	3	17
Public Data Network Operators	1	1	1	4	6
Public Switched Network Operators	1	1	1	2	2
VSAT Hub Operators	1	1	1	2	2
Local Loop Operators	-	-	-	2	4
VSAT Terminal Licences	36	56	75	130	336

Source: CCK

Local loop operators (LLOs) are one of the more interesting categories for UA. A consultative meeting between the licensed LLOs, the CCK and the incumbent operators in 2003/2004 agreed that these operators shall be allowed to connect to fixed and mobile operators and operate a full fixed network within administrative districts (CCK's Annual Report, 2003/2004). Once these operators start rolling out their networks, they are likely to make inroads in the rural areas. Perhaps the mechanisms proposed in this report will attract them to operate in the rural areas.

Rural Electrification

Communication services depend heavily on electric power. According to information obtained from the Ministry of Energy, the status of rural electrification is summarized as follows:

- **Penetration.** The rural electrification programme was started in 1973. The rate of penetration however had been slow, with only 91,069 directly metered consumers having benefited from the programme by January 2004. This represents a penetration of about 4%.
- **Cost.** The average cost of supplying a rural consumer was KShs. 180,000, which is about seven times the national per capita income in 2002.
- **Utilization.** Despite the high cost, very few of those connected in rural markets have made much economic use of the electricity. This may be

attributed to very high levels of poverty, lack of awareness on the potential for electricity to stimulate income-generating activities and lack of appropriate financing schemes to promote commercial and industrial enterprises.

- **Levy.** The 5% rural electrification levy introduced in 1998 is largely used to finance net operating losses, leaving very little for system expansion.
- **Planning.** The rural electrification programme planning is not properly incorporated into integrated energy and development planning. An inter-ministerial committee, including the Kenya Power and Lighting Company (KPLC), which also doubles as the implementing contractor, has been running the programme.

Summary of Key Opportunities and Challenges

From the above review of the communications sector, the following are the key opportunities and challenges with respect to communication services and rural areas.

(a) Opportunities

- the coming together of Information and Communications in a new ministry
- the new licensing framework released by the CCK in September 2004
- the maturing of the CCK as a fairly independent regulator

(b) Challenges

- the government's ad-hoc approach to ICT policy and strategy formulation and implementation
- the low penetration of fixed telecommunications infrastructure in the rural areas
- the decline in fixed telephone connections despite increased exchange capacity
- the steady closure of some of the uneconomical post office outlets
- limited penetration of rural electrification
- the policy framework governing postal services

4. Supply Analysis and Recommendations

This chapter summarizes the results of the study that focused on establishing the factors that inhibit operators and other suppliers from providing communication services in rural areas in Kenya and recommending appropriate supply strategies. This summary focuses on an analysis of the supply situation and makes recommendations.

Supply Analysis

Coverage Situation

The status of coverage of the various communication services, including power, is shown in Annex 1. The data is restricted to districts and divisions because data at lower level is very difficult to obtain. The key features of the coverage situation are summarized below:

- **Telecommunication services.** TKL has 100% coverage for fixed telephone services in every district. The total coverage, whether by automatic or manual exchanges, is shown in Annex 1. The initial coverage by the mobile network operators is shown in tables 3.5 and 3.6 in chapter 3 above. Annex 1 shows the more recent coverage²⁰. The data in this table is however not very accurate.
- **Postal/Courier Services.** Since the liberalization of postal services in 1999, post office outlets have steadily declined from 1,036 to 872 in 2004. This has largely been attributed to the closure of non-commercial outlets countrywide as a result of commercialization. The total coverage, whether by head office, departmental or sub-post offices, is shown in Annex 1. The private courier firms are concentrated in major towns and along major transport routes, which are covered by PCK.
- **Internet and Data Services.** TKL's Internet points of presence in the various towns in the provinces are shown in Table 4.1 below:

Table 4.1: TKL's Internet Points of Presence

Province	Exchanges/Towns ²¹
1. Nairobi	City Centre, Milimani, Parklands, Westlands, Nairobi West, Nairobi South, Karen, Jamhuri, Embakasi, Kileleshwa, Ruaraka, Stima Plaza, Kahawa, Karuri, Kariobangi, Ngong, Uthiru, Gigiri, Eastleigh, Kabete
2. Coast	City Centre, Nyali, Makupa, Bamburi, Diani, Changamwe
3. Eastern	Machakos, Athi River, Meru

²⁰ Kencell reported that it had covered 20% of the land mass but 55% of the Kenyan population.

²¹ The Internet POPs (or Jambonet POPs) are via Kenstream nodes installed in the telephone exchanges in the towns shown.

Province	Exchanges/Towns ²¹
4. Rift Valley	Nakuru, Eldoret, Kabarnet, Kapsabet, Naivasha, Kericho, Menengai, Kitale
5. Central	Nyeri, Thika
6. Nyanza	Kisumu, Kisii
7. Western	Kakamega
8. North Eastern	Garissa

Source: TKL, October 2004

With these POPs, ISPs can provide Internet services within those towns or locations.

The PCK has established Internet services using 540 VSAT terminals in 360 of its 872 postal outlets (Posta Surf initiative). These are concentrated in various post office locations within Nairobi, Mombasa, Kisumu, Nakuru, Nyeri, Eldoret, Meru and Kitale districts. This has increased Internet points of presence to those provided by TKL. Given the widespread nature of post offices, the PCK's Posta Surf initiative has penetrated areas that did not previously have Internet services. The presence of Internet via the Posta Surf project is shown in the table in Annex 1 with X PO.

In addition, the public data network operators, who were licensed from 2003, have concentrated their networks in Nairobi. They are now beginning to move out into provincial capitals, extending Jambonet points of presence. Now that these operators can provide voice communication and establish their own Internet gateways, we expect to experience more penetration into the rural areas.

- **Broadcasting services.** The status of coverage by radio and television is shown in Annex 1. For television, the data used was from the KBC, which generally represents the coverage by all TV broadcasters. The same data shows that the following districts (Table 4.2) have limited or no coverage:

Table 4.2: Districts with little or no Television coverage

Province	Districts
1. Nairobi	-
2. Coast	Kilifi, Kwale, Taita—Taveta, Lamu, Tana River
3. Eastern	Kitui, Mwingi, Makueni, Marsabit, Moyale
4. Rift Valley	Baringo, West Pokot, Turkana, Samburu, Elgeyo Marakwet, Trans Nzoia, Laikipia, Narok
5. Central	Nyandarua
6. Nyanza	Siaya, Kuria, Homa Bay, Suba, Bondo, Gucha
7. Western	Mt. Elgon
8. North Eastern	Garissa, Mandera, Wajir, Ijara (the whole province is not covered)

The following is the current situation with respect to radio and television targets:

- i. KBC radio covers 95% of the population
- ii. KBC television covers 65% of the population
- iii. 87.2% of households have a radio set
- iv. 17.1% of households have a TV set

▪ **Rural electricity service.** As outlined in chapter 3 (section 3.5) and according to Sessional Paper No. 4 of 2004 on Energy Sector Policy, the penetration of rural electrification (electricity service connections as a percentage of the rural population) is about 4%. According to this Sessional Paper, the goal is to increase this to 20% by 2010. The following additional information was obtained from the person in charge of rural electrification in the Ministry of Energy:

- i. There are no national rural electrification plans yet.
- ii. The French Government had committed EUR 30 million for rural electrification immediately. The demand however is estimated at EUR 45 million. Based on priorities, an allocation of the EUR 30 million will be done by November 2004.
- iii. The Ministry is in the process of compiling the five priority projects to be funded in each district and expects this to be over by December 2004.
- iv. It is expensive to extend the national grid in North Eastern Province. The plans are to provide solar power of 400 Amp-hours to each of the following secondary schools by February 2005 (Table 4.3):

Table 4.3: Secondary Schools to Have Solar Power in North Eastern Province

District	Secondary School
Garissa	Modogashe, Sankuri, Dadaab, Bura, Balambala
Wajir	Habaswein Boys, Habaswein Girls, Griftu, Khorofuharar, Furaha, Bute
Mandera	Takaba, Arabia, Elwak, Rhamu, Sheikh Ali
Ijara	Shurie

Excluding radio and television services, which have a relatively large coverage of the population, Annex 1 shows that 139 (out of 480, excluding Nairobi) divisions are not covered.

The distribution of these uncovered areas in the provinces and as a percentage of the total divisions is shown in Table 4.4 below.

Table 4.4: Distribution of Uncovered Divisions

Province	Rural Poverty	Total Divisions	Divisions Uncovered	Districts Involved	Percent of Divisions
1. Nairobi		8	0	0	0.0%
2. Central	31	36	0	0	0.0%
3. Coast	61	40	7	5	17.5%
4. Eastern	58	100	36	12	36.0%
5. North Eastern	70	47	31	3	66.0%
6. Nyanza	64	65	21	10	32.3%
7. Rift Valley	48	149	37	14	24.8%
8. Western	60	43	7	5	16.3%
TOTAL/AVERAGE		488	139	49	29.0%

From this table, the 139 divisions are in 49 districts. The North Eastern Province has the worst coverage, with two thirds of its divisions uncovered; Eastern and Nyanza, each with about a third of its divisions uncovered, follow it. The three provinces also have some of the worst poverty levels. Overall, excluding Nairobi, 29% of the divisions are uncovered.

The costs of providing services in these uncovered areas are worked out in chapter 7 under the UA funding strategy.

Key Challenges

The key challenges that operators face in providing communication services to the rural areas are:

a) Telecommunication Services

- **Demand.** The demand for exclusive line connections is low due to cost that the rural people consider high. All the telephone operators have come up with packages that enable many people share the cost of ownership of a telephone; the packages are therefore suitable for deployment in the rural areas. These packages are reviewed in the next sub-section.
- **Commercial viability.** Profitability in rural areas is low with low revenue generation and low return on investment (ROI). Nairobi and Mombasa, for example, contribute 80% of the TKL's revenues. It follows that an operator will focus in the areas that provide most revenues, leaving out rural areas. The respondents stated that if there was some sort of subsidization, they would go to the rural areas. In addition, base transmitting station costs are high for much lower traffic than in urban areas; consequently recouping the investment is difficult in the rural areas. Operators indicated that availability of appropriate incentives would attract them to the rural areas.
- **Cost of leased lines.** TKL's leased lines are expensive, negatively impacting access to communication services.

- **Type approval.** The cost of type approval to the suppliers is high. In addition, the CCK does not have an adequate capacity to track and type-approve emerging and changing technologies.
- **Support capacity.** There is lack of human support capacity in the rural areas.

b) Postal/Courier Services

- **Cost of parcel distribution.** The current door-to-door service for courier is expensive because it entails creating a huge distribution network.
- **Poor road infrastructure.** This affects the capacity and cost to deliver to many parts of the rural areas.
- **Security.** This particularly with respect to the theft of motorbikes that do the distribution.
- **Low disposal income** to meet the high cost of access or use courier services.
- **The government's procedures.** The PCK would like to roll out an e-wallet project in order to offer improved financial services to the rural areas but is restricted by Central Bank's rules on deposits. Profits of the e-wallet services will help justify rural expansion. In addition, the PCK, as public organization, is tied to the public procurement processes, which are too long. One consequence is that potential suppliers lose faith in the process, which in turn negatively affects the capacity to offer urban and rural services.

c) Broadcasting Services

- **The government's bureaucratic procedures.** The process of obtaining broadcasting frequencies and licences is time consuming and frustrating. In addition, there is no clear framework on licensing in broadcasting. It is hoped that the new Ministry of Information and Communications will take up this challenge.
- **Low-income levels.** Rural areas are not able to attract funding to meet the high cost of investment (advertising) because of the people's low disposable incomes.
- **Poor and unreliable road infrastructure.** This increases the maintenance cost.
- **Lack of electricity.** This affects both the broadcaster and the consumer.
- **Unavailable and/or expensive telecommunications infrastructure.** This is required for signal distribution.
- **Location and language.** Rural coverage is limited by the location and language.

d) Internet and Data Services

- **Inadequate national Internet bandwidth.** TKL's Internet bandwidth is inadequate to meet the requirements of ISPs and other customers.
- **Cost of backhaul links.** The cost of backhaul links from TKL and Alldean Satellite Networks Ltd. is high for ISPs.
- **Cost of frequency spectrum fees.** The charging model for frequency spectrum fees is based on voice communication, which makes it high. At

the same time, there is no differentiation for rural operators. A mechanism for reducing the fees for rural operators would reduce the cost of rural operations, in turn reducing the cost to the customer.

- **Illiteracy and language.** Many people in the rural areas cannot use the Internet because of illiteracy and language barriers.

e) Other General Challenges

- **The government's bureaucratic procedures.** Clearing imported products at the ports of entry can take up to one month (turnaround in other ports, for example, Dubai takes hours), with inspections of equipment by the CCK often adding up to this delay.
- **Standards in IT.** There is no legal framework to enforce IT standards and no mechanism to discipline wayward professionals.

Key Costs

Duties and Taxes

Most of the operators argued that import duties are too high. Although the government had zero-rated computers, the duties on other equipment required to provide communication services are still high. The following are the import duties and taxes for key equipment used in communication:

▪ Telecommunication equipment (HS code 8517)	15%
▪ Radio equipment (HS code 8525)	25%
▪ Fibre optic equipment (HS code 8544.70)	15%
▪ Computers (HS 847330 and 8471)	0%
▪ Other accessories, e.g. racks	25%

The government zero-rated cellular phone instruments (HS 8525.20.91), which has been a significant factor in reducing the cost of cellular phones. However, there currently is a 10% excise tax on airtime for mobile telephone operations. This makes the cost of communication expensive to the customers.

Logistics of import and transport to sites increases costs up to 10%. In addition, logistics cause delays due to bureaucracy in the ports of entry.

Frequency Spectrum Fees

The purpose of charging frequency spectrum fees is to meet the costs of spectrum administration and maintenance, including the costs of assignments, interference resolutions, spectrum clearance and other matters pertaining to the smooth and efficient utilization of the spectrum. The fees charged do not discriminate between urban and rural operators, though for the latter the cost per customer is much higher given the comparatively smaller number of customers. At the same time,

the models and considerations used to calculate the fees are largely borrowed from ITU and are engineering-oriented. They therefore tend to give amounts that are much higher than the cost of spectrum administration and maintenance. The current frequency spectrum fee schedule, which gives the methods of calculating the fees (see CCK's website), is based on engineering models. The basis needs to be changed from engineering to economic models.

It is recommended that this schedule be revised to reflect the true cost of administering and maintaining the frequency spectrum. At the same time, socio-economic considerations with respect to what will be achieved using the equipment whose frequency is allocated in a certain area needs to become a major consideration in this review. In addition, there should be a significant cost rebate, as an incentive, for rural-based operators. There is already precedence on this. CCK gives 50% rebate on frequency spectrum fees for all rural microwave links, where rural links are defined as those outside the municipalities of Nairobi, Mombasa, Kisumu, Eldoret, Nakuru, and Nyeri.

Rural Packages

The various operators have come up with a number of packages that are suitable for the rural areas. These are Simu ya Jamii, Simu Yetu and Mzalendo, as outlined in the box below.

Simu ya Jamii is Safaricom's brand name of a public payphone or community phone. It retails airtime through payphones operated by small-scale entrepreneurs. Companies such as Dial Africa Ltd buy bulk airtime minutes from Safaricom at a special tariff of KShs. 20 and retail the airtime through kiosk operators. The kiosk operators in turn sell the airtime at a price of up to KShs. 5 for three seconds. Adondo, the more dominant telephone set, has predominantly been used for telephone calls. It however can be used to dispense airtime (a printer costing about KShs. 20,000 is required) as well as to provide fax and Internet services (a personal computer is required).

Low entry barriers has enabled many micro-entrepreneurs to invest in Simu ya Jamii kiosks in various parts of the country thereby making access to mobile services more accessible and affordable. The cost of these phones has been coming down and most are now between KShs. 20,000 and KShs. 30,000. These public payphone may be powered by mains power or car battery, and therefore be deployed anywhere in the rural areas as a community phone. This phone has also been found useful to people with personal phones because of the attractive tariffs—that one needs KShs. 5 or less to make a call in comparison to purchasing air time for more than at least KShs. 100 to KShs. 250. The attractiveness is more in what one has to spend in order to make a call than a case of lower tariffs—a perception issue.

Simu Yetu is Kencell's community payphone, which replaced the unattended public payphone.

Mzalendo is a TKL initiative for the unattended single public payphone to compete with the mobile operators' community phone initiatives. In addition, TKL has started rolling out telecentres as a strategy to enable many people to share the cost of ownership of

telephone facilities. These telecentres offer a combination of a range of services, including Internet, fax, photocopying and telephone services. The telecentres are being marketed to entrepreneurs who have the money and are willing to invest in this type of business. TKL only provides the lockable public payphones and the branding of the facility. The entrepreneur would keep all the revenue from the other services and share the public payphone revenue with TKL. Given the high cost of the telecentres, between KShs. 300,000 – 800,000, the telecentre initiative is more feasible in the urban and peri-urban areas. Mzalendo, where investment for a single telephone may soon go below KShs. 20,000 is more appealing for the rural areas. The key cost challenge is the cost of a telephone booth if the micro-entrepreneur is to operate in an open area – which is currently KShs. 40,000.

It is important to note that a number of micro-finance institutions (MFIs) are now providing loans to rural people to become operators of the community payphone packages that have been created. For example, K-Rep is providing upto 100% loan to micro-entrepreneurs to purchase Simu ya Jamii. The applicant pays 1% of loan value for the application form and a further 1% of the loan value for insurance. The security for this loan is either a group guarantee or moveable assets (for example, the Adondo telephone instrument itself) and a cash collateral of 20% of the loan amount. This collateral is refunded at the end of the loan repayment. In order to qualify, the loatee must provide for assessment a guarantor if unemployed, business cash flow if self employed, and payslips if a salaried employee. The key challenges that K-Rep has experienced in extending loans to purchase the mobile phone facility are:

- many cheaper competing products (K-Rep supports the acquisition of the Adondo phone facility)
- loan repayments defaulting, largely because of competition
- licensing by local authorities (trade license of KShs. 5,000 is required)
- lack of availability of a bank or non-bank financial institution in the rural areas; most of these are in urban and peri-urban areas

Other Costs

The other key costs are outlined below for each service:

- **telecommunications**—logistics of transporting equipment from port of entry to site (this can contribute up to 10% of the total cost)
- **broadcasting**—recurrent cost of commercial power and back up for transmission equipment; cost of towers; and the cost of maintenance
- **postal/courier**—logistics for mail and parcel distribution
- **Internet and data**—recurrent cost of bandwidth

Supply Recommendations

The following are recommendations to help service providers to expand services to the rural areas:

- a) Establish a rural communications stakeholder forum, which will address issues affecting stakeholders for rural communications on a regular basis. This forum will help integrate rural communications development with other rural development issues and create synergy among the operator initiatives.
- b) Define a flagship application that anchors growth in the rural areas. If, for example, education is determined to be the flagship application, then the rural ICT strategy should target all schools over a defined time frame. This gives ICTs a guiding purpose and role as a catalyst in rural development.
- c) Implement a framework that compensates the extra cost borne by operators while serving the rural areas. An alternative approach would be to empower the rural consumers to pay for the services provided. This could be a funding mechanism or incentive to reduce added costs of operations in rural areas. One area for consideration is taxation. A rebate should be considered for rural operations. Such an incentive has been in place for manufacturers in rural areas.
- d) Review licensing fees philosophy to be related to the potential clientele to be served. In radio spectrum licensing, the fees should be reviewed to reflect the potential clientele in the area, to reflect the socio-economic impacts of providing communication services in the area and to act as an incentive for rural operators.
- e) Encourage operators to share infrastructure in the rural areas to reduce costs. In the long run, the operators should be encouraged to consider local roaming in the rural areas.
- f) Research and development should be tailored to address the needs of the rural market. The CCK should establish a framework to work closely with NCST to prioritize research in ICTs and specifically rural ICT tools and applications.
- g) Tailor human resource development to support training needs of the rural areas. A case in point is to standardize curriculum not to disadvantage ICT training institutions in the rural areas.

5. Demand Analysis and Recommendations

This chapter presents the methodology that was used to carry out the baseline survey and summarizes the findings. The findings are summarized along the issues of availability, accessibility, affordability, demand for and knowledge of services and user preferences for the key types of communication services. The chapter ends with some recommendations.

5.1 Baseline Study Methodology

Kenya is administratively divided into eight provinces and 72 districts. Each district has been further sub-divided into divisions, each division into locations and each location into sub-locations. During the Population and Housing Census of 1999, the sub-locations were segmented into convenient census areas known as EAs. These enumeration areas have census information categorised by an administrative area so as to facilitate ease of access. This information was used in designing the fourth National Sample Survey and Evaluation Programme (NASSEP IV) master sample. This master sample provides the framework for all household sample surveys in the country. NASSEP IV has 1,800 EAs of which 1,260 are designated as rural and the rest are designated as urban. The EAs were developed into clusters and these are the sampling sites for household surveys. Each cluster has a map and a household listing used for the identification of the clusters and selected households.

The rural areas of Kenya constituted the study population. In the development of the sampling frame, rural areas were defined as conglomerations of EAs with population sizes below 2,000 people and excluded designated district headquarters. "Rural areas" is therefore here used to refer to all parts of the country that fall within sampled districts but that fall outside the boundaries of designated cities, municipalities, towns, and urban centres in line with the CBS classification of rural, urban, and peri-urban. This classification ties in with the provisions for setting communication tariffs in Kenya.

In collaboration with the CCK and the Central Bureau of Statistics (CBS), the rural areas of Kenya were stratified into zones on the basis of the number and type of communications services available, namely, postal, fixed telephone line, mobile telephone, courier, Internet services, and broadcasting. Four strata were envisaged. Subsequently, these strata were mapped out in terms of the districts that they cover, using existing administrative boundaries and on the basis of which a total of 12 districts were randomly selected. Each selected district was then broken down into clusters using the CBS's national sampling frame, for purposes of expanding diversity and so as to increase the possibility of inclusion in the sample. In selecting the clusters, special attention was paid to variations in ecology,

cultural practices, physical infrastructure, economic activities, population density and service delivery, among others.

5.1.1 Sample Selection

The rural parts of the country were stratified into zones on the basis of the number and type of communication services available, namely, postal, fixed telephone line, mobile telephone, courier, Internet access, and broadcasting. This categorization was made possible with the use of network maps and related information from service providers including the PCK, TKL, Safaricom, Kencell, the Nation Media Group, Akamba Bus, and Securicor, among others. Thereafter, the distribution of these services was mapped out in terms of the districts that they cover, using existing administrative boundaries. Four strata were observed as depicted in Table 5.1 below.

Actual sample selection involved a multi-stage sampling procedure and was based on the NASSEP IV national sampling frame as developed by the CBS. First, a total of 16 districts were randomly selected from the four strata using the Probability Proportional to Size (PPS) method. In all cases, the urban segments of the districts were excluded from each of the stratum's population before sample allocation and selection. Special attention was paid to variations in ecology, cultural practices, physical infrastructure, economic activities, population density and service delivery, among others.

The allocation of the sample of households to the four strata was proportionate to the total number of households in the districts forming each stratum, based on the results of the 1999 Population and Housing Census. After allocation of the sample to the strata, the next allocation was made to the selected districts in each stratum. This was done proportionate to the population size of the selected districts.

Each of the selected districts was then broken down into its various clusters for purposes of expanding diversity and so as to increase the possibility of inclusion in the sample. Selection of clusters from the selected districts was done using the Equal Probability Sampling Method (EPSEM) and on the basis of which a total of 86 clusters were randomly selected. Each cluster was allocated 13 households except for Garissa, whose three clusters were over-sampled (with 20 households each) to give an adequate sample.

The sample size for the survey has been designed to provide rural national estimates without dis-aggregating to lower levels. A sample of 1139 households was selected spread over 86 clusters.

Table 5.1: Distribution of the Sample by Strata and by District

Stratum	Number of Clusters	Number of Households
One Service		
Lugari	3	39
Rachuonyo	4	52
Two Services		
Kuria	3	39
Keiyo	3	39
Makueni	8	104
Three Services		
Nyambene	9	117
Garissa	3	60
Four Services		
Bungoma	8	104
Kisumu	4	52
Kisii	5	65
Nakuru	10	130
Narok	4	52
Kirinyaga	6	78
Thika	6	78
Meru Central	6	78
Kwale	4	52
Total	86	1139

The household was the unit of analysis, and the head of household was the respondent. An interviewer-administered questionnaire with both closed and open-ended questions was used to solicit responses from both male and female heads of households. Identification of the clusters was done using cluster maps and using the assistance of field guides. Within each cluster, household listings made possible the identification of selected households. Where a household head was absent for long periods, the selected household was replaced randomly.

In addition, several key informants were selected from among the community and within sampled districts on the basis of their level of expertise and experience. These included the business community and groups such as cyber café and telecentre owners, payphone users, mobile telephone owners, private line owners, post office box owners, heads of institutions, community-based organisations (CBOs), non-governmental organisations (NGOs), video house operators, community leaders, and other gatekeepers. The aim was to assess what in their perception, is the importance of communication services in their localities, what they see as key challenges and how, in their view, UA could be attained.

General perceptions and discussions on how to enhance universal access were captured in Focus Group Discussions (FGDs). Participants were drawn from within the same cluster as the survey, omitting individuals who would have participated in completing the questionnaires. Special attention was paid to variations in the

socio-economic characteristics of participants and actual access and utilisation of communication services. Twelve FGDs were held, spread out across some of the following categorisations: primary school-going youth, secondary school-going youth, youth out of school, farmers/herders, women, men, and payphone users. Each FGD comprised about ten participants.

The quantitative baseline survey data was analyzed with the aid of the SPSS package. Information gathered through key informant interviews and FGDs was transcribed and used to triangulate observations made through the survey data. The primary objective is to demonstrate what the CCK should take into account while developing a strategic policy towards UA to communication services in rural Kenya.

5.2 Results

5.2.1 Availability

5.2.1.1 Postal/Courier Services

Postal services are widely distributed in the country. As observed in chapter 3, however, there are 872 postal outlets in the country, with 36,365 inhabitants having access to an outlet. In comparison, courier services are generally limited in rural Kenya. Only 12% of the respondents reported availability within their locality.

5.2.1.2 Fixed Telephone Services

As argued in chapter 3, the penetration of the fixed telephone network is limited. Indeed, in 2004, the fixed line teledensity fell for the first time to below 1% (0.944) while that for mobile telephones went past 8% (see tables 3.2 and 3.4 in chapter 3).

5.2.1.3 Mobile Telephone Services

As illustrated in chapter 3, the penetration of the mobile telephone network has been increasing rapidly in the last five years. By 2004, the mobile line teledensity had gone beyond 8% (see Table 3.4 in chapter 3).

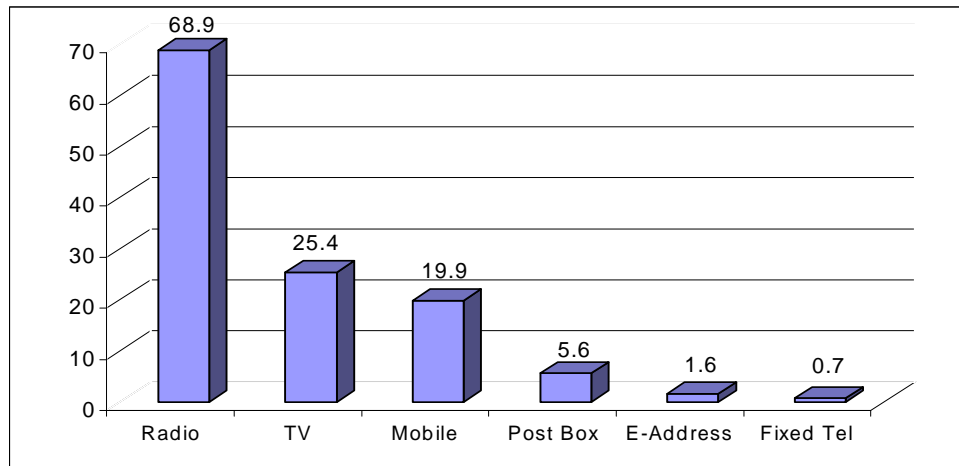
Close to 82% of the respondents indicated that there was mobile coverage in their residential areas. Another 9% however did not know whether there was coverage or not. The remaining households (8.6%) reported no coverage.

5.2.1.4 Broadcasting Services

Most people power their radios using dry cells (80%). A few use car batteries (9%), electricity (8%), or solar energy (4%).

Figure 5.1 below shows the ownership of the various end-user communication equipment.

Figure 5.1: Ownership of listed communication equipment



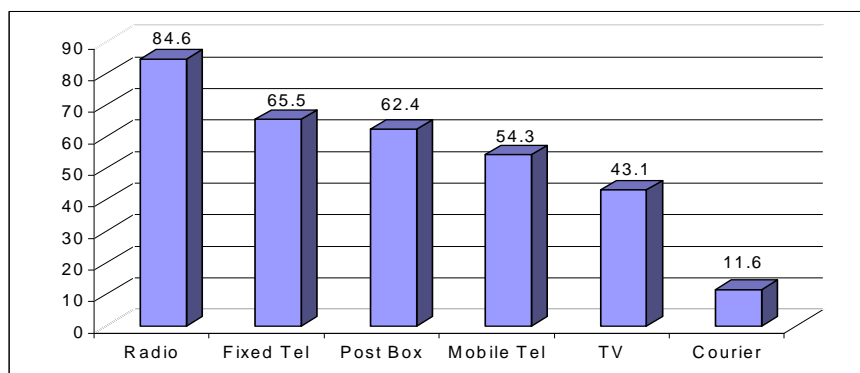
Therefore, other than radio where we are approaching universal service, the other services require public access points in order to increase the level of access by as many Kenyans as possible.

5.2.2 Accessibility

5.2.2.1 General Access

Despite the limited provision and ownership of communication equipment, many people reported having access to various services. Figure 5.2 below shows the general access to the various communication services.

Figure 5.2: The proportion of people reporting access to communication services (%)



The specific access situation is summarized below for the various services:

- **Fixed telephone services.** The majority of people without a fixed telephone line at home depend on a public telephone booth (88%), while another 12% depend on the telecentre or telephone booth, neighbours or place of work. The telephone booth was named by 61% of the respondents as the facility where they received their last telephone call. The rest of the people reported that they received their last telephone call through relatives, business associates, or nearby public facilities.
- **Mobile telephone services.** Households with no access to a mobile telephone (46%) mainly explained this in terms of associated expenses. Almost all of these households stated that mobile telephones are expensive to acquire and to maintain. The rest reported having no need for a mobile telephone, while a few of them reported lack of network in their areas of residence.

Many of the households access the mobile telephone through relatives (22%), or friends and neighbours (54%). About 20% of the households own a mobile telephone and 4% depend on telecentres. The rest depend on employers or public offices such as the chief, the assistant chief or the church pastor.

- **IT services.** Most of the faxes were sent from a commercial centre (60%). Over one third of the people sent them from their work place, and another 6% sent their last fax from a friend's place.
- **Postal services.** Those with no access to a post office box explained that they have no need for one; a situation attributed to the fact that they do not receive letters and/or can neither read nor write. An equally significant proportion of households with no access to a post office box stated that it could not afford to acquire and maintain such a facility. A few other people reported that postal services are too far away or unavailable and a similar proportion argued that there was no reason they did not have access to a post office box; this particular group had never stopped to wonder why it had no access to a post office box and whether they needed one.
- **Courier services.** Courier services were generally within reach of a small population given that these services are concentrated in large towns.
- **Radio services.** People without access to radio services said that this is because they find radio to be expensive to acquire and maintain. Another 10% reported that they used to have access but the situation has since changed because their radio got stolen or it was broken down. About one fifth of the population (19%) however did not have access to a radio because they saw no need for one.
- **Television services.** The majority among households with no access to television explained that they find television sets expensive to acquire. The

rest reported that they do not have the necessary infrastructure, mainly electricity and the required signal for reception. A few people stated that they see no need for television while others reported that they have no knowledge of what a television does and thus see no value in seeking access.

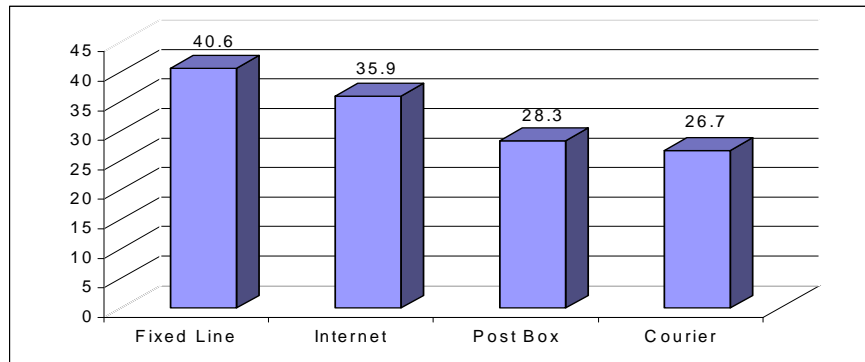
Only 58% of the households with access to television own a set. The rest depend on family members, relatives, friends, neighbours or social places. Over ten television stations were listed as accessible. The KBC Television was top followed by KTN, Nation, Citizen and Family. Some of the television stations listed operate from neighbouring countries, such as Tanzania, Uganda, and Somalia.

Although access to TV is a function of resources, there are situations where some households are unable to access television even when incomes are comparatively high. One of the key concerns among rural communities is that television stations use a language that they do not understand. The easy option here is to adopt regional/national languages in the presentation of television programmes.

5.2.2.2 Distances to Access Services

Figure 5.3 below shows the proportion of people living within three kilometres of the listed services.

Figure 5.3: The proportion of people living 3 kilometres from each of the listed services



The majority of rural dwellers therefore live at least more than three kilometres from the nearest service points. Specific distances for the various services are outlined below:

- **Fixed telephone services.** Households travel an average of six kilometres to the nearest telephone, and in some instances, up to 100 kilometres to the

nearest facility. This costs an average of KShs. 50, and ranges between KShs. 10 and KShs. 200. Interestingly, most households (70%) reported that they often make the trip just to access a telephone. A few households combine the trip to make a telephone call with other business. This is largely because of the long distances to the nearest telephone facility and associated expenses or just because there is often no urgency in their messages.

- **Mobile telephone services.** Over 57% of the households reported that the mobile telephone network was only a kilometre away from their homes and this was no more than three kilometres for 90% of the households. Some households reported no coverage within walking distances. On average, households not covered travel for three kilometres to the nearest mobile network area.

Most people with mobile telephones re-charge their handsets at home using electricity (37%), car battery, (15%) or solar energy (8%). The rest depend on nearby shopping centres (24%), friends and neighbours (8%), nearby institutions (4%), or their workplace (3%).

Households that re-charge their handsets outside the home travel an average of nine kilometres to the source of energy. Whereas some people cover up to 120 kilometres to the nearest source of energy, the majority covers between two and three kilometres. Re-charging the mobile telephone costs between KShs. 10 and KShs. 100, and most people pay only KShs. 20.

- **Internet services.** On average, people travel more than 22 kilometres to reach the nearest provider and this was found to go as high as 141 kilometres. The service is accessed through cyber cafes (65%), friends (16%), and work place (14%); 6% of the population accesses Internet through the post office.
- **Postal services.** On average rural people live about 10 kilometres from the nearest post office. For some, these distances run up to 120 kilometres²².
- **Courier services.** Most households estimated that the nearest courier service was about four kilometres away, although this ranged between one and 120 kilometres away.

5.2.2.3 Access by Category

With respect to variations in access by region, gender, age, marital status, level of education, and income activities, the results are summarized below for the various services:

²² Most rural areas are served by the sub-post office category (63%). Moreover, one in ten rural households depends on postal agencies or franchise holders (9%), many of which are located within local shops. About one third of the population is, however, accessible to departmental (26%) or head office category (3%).

(a) Post office box

- i. **Region.** Western Province had the largest number of households reporting access to a post office box (84%). Rift Valley (67%), Central (65%), and Eastern (60%) provinces followed this province. Nyanza (59%) and Coast (51%) Provinces follow them with less than two thirds of their population having access. None of the respondents from North Eastern Province reported having access, partly because of the unique nature of their settlement.

Largely households living in Nyanza and Western provinces access courier services. Rural households in both Coast and North Eastern provinces did not utilize courier services. The varied utilization of courier services suggests that access is dependent on the availability and distances travelled, or the possible availability of alternatives.

- ii. **Gender.** While 66% of male-headed households had access to a post office box, 59% of female-headed households had access to a post office box. More men than women therefore have access to a post office box and, by extension, ready access to this mode of communication. Similar patterns were observed with regard to the utilization of courier services between men and women.
- iii. **Age.** Generally, access to a post office box tends to favour younger people, mainly those in their middle age. About two thirds of households headed by people aged between 35 and 64 years had access to a post office box as compared to 61% among those aged between 15 and 34 years. Only slightly more than one half of households headed by people aged between 65 and 74 years had access to a post office box; the proportion was lowest among households headed by people aged 75 years or more (37%).
- iv. **Marital status.** Households headed by people who have never married constituted the majority among people with access to a post office box, followed by those married and in monogamous unions. Fewer households among those that reported being polygamous or divorced had access to a post office box. Widows and widowers were the most disadvantaged with regard to having access to a post office box.
- v. **Level of education.** Households with university level education enjoyed a UA to postal services (100%). Those with post-secondary education (86%) and secondary school education (80%) follow. Access to postal services was least available to households headed by people with no formal education or those with adult education skills.
- vi. **Economic activities.** Access to a post office box is highest (80%) amongst households that are engaged in off-farm economic activities. Households

where most adults have remained on-farm are less likely (62%) to have access to a post office box. This confirms the general observation that rural households are the most disadvantaged with respect to obtaining access to various communication services.

- vii. **Level of income.** All 100% of households with a cash income of over KShs. 20,000 per month had access to a post office box. Indeed, the general pattern suggests that the higher the monthly income, the larger the number of households with access to a post office box. Households with monthly incomes falling below KShs. 6,000 were among the fewest people with access to a post office box. However, 44% of households with no monthly income reported having access to a post office box. The latter observation suggests that access to a post office box goes beyond an ability to pay. Some people obtain access even when they are not in a position to directly pay for the service.

(b) Fixed telephone services

- i. **Region.** The Rift Valley Province reported the highest proportion of households with access to a fixed telephone (79%), followed by Central (73%), Western (69%) Nyanza (61%) and Coast and Eastern (59% each); the North Eastern Province is the least served (32%).
- ii. **Gender.** More men (71%) than women (61%) have access to a fixed telephone service. This is in line with the general observation that women are relatively disadvantaged. That the disparities are not large suggests that other factors may account for these variations, however.
- iii. **Age.** The fixed telephone is mostly sought after by the relatively young, between the age of 15 and 44 years (with each age category having more than 66% having access). People of the age of 75 years and above have the least access (less than 30%).
- iv. **Level of education.** All respondents with university level education had sought the use of a fixed telephone line compared to 89% of those with post-secondary and 83% for respondents with secondary school education. Less than two thirds of people with primary school level education sought use of a fixed telephone line while one third of people without formal schooling sought use of a fixed telephone line.
- v. **Economic activity.** The majority (over 80%) of those engaged in off-farm economic activities, mainly wage employment had access to a fixed telephone line, followed by households engaged in farming (63.2%) and households that undertook petty business or were self-employed (55.8%).
- vi. **Income level.** All households earning over KShs. 20,000 a month had access to a fixed telephone line. The proportion of households having access to a fixed telephone line varied in other income groups in a graduating scale with only half of the lowest income earners accessing fixed telephone services. Surprisingly, however, more than 50% of the

households without a monthly income had accessed a fixed telephone line.

(c) Mobile telephone services

- i. **Region.** The majority of people with access to a mobile telephone were from Nyanza province (63%), followed by Western (57%), Rift Valley (56%), and Central provinces (55%). Only half of the population in each of Eastern and Coast provinces reported having access to a mobile telephone. None of the respondents from North Eastern Province had access to a mobile telephone. Evidently, availability of network is in itself not sufficient to ensure access to this service.
- ii. **Gender.** Men have a higher level of access (57%) than women (52%). This could be attributed to that more men than women command access to a cash income.
- iii. **Age.** The mobile telephone is most accessible to people aged between 35 and 54 years who are largely the economically and sometimes financially stable segments of the population. A significant proportion of people aged below 25 years however has access to a mobile telephone. People in mid 70s and beyond are relatively disadvantaged in this respect.
- iv. **Level of education.** All people with university level education reported total access to a mobile telephone. The proportions were equally significant among households with secondary or post-secondary education. Primary school leavers and people with no formal education had the lowest access.
- v. **Economic activity.** People with salaried employment constitute the majority among mobile telephone owners (70%), closely followed by those engaged in self-employment or petty trade (65%) and other forms of off-farm engagements. Only less than one half of households that derived their livelihood from farming had access to the mobile telephone. Mobile telephones therefore are not readily available to the majority in the rural areas who are engaged in farming.
- vi. **Income level.** More than half of the households that earn at least KShs. 6,000 per month have access to a mobile telephone. Indeed, all households who earn more than KShs. 20,000 per month have access to a mobile telephone. The proportion of households with access to a mobile telephone reduces with the level of monthly income. A section of households that reported zero monthly income has access to a mobile telephone, however, suggesting therefore that in some instances, access to a mobile is beyond one's income, especially for the low-income earners. This is a pointer towards the usefulness of social ties in enhancing access to communication services among disadvantaged groups.

(d) IT services

- i. **Region.** The proportion of the population with access to a computer is highest in Nyanza (13.4%), Coast (12.5%) and Eastern (10.3%) provinces, followed by Rift Valley (6.7%) and Central (6.1%) provinces. Western Province registered the lowest access to computers (3%). None of the respondents from North Eastern had ever accessed a computer.

The majority of the people that reported having access to the Internet are from Nyanza, Rift Valley and Coast provinces. Eastern and Western provinces registered the lowest levels of access while North Eastern and Central provinces reported no access to the Internet. Interestingly, the levels of Internet access do not necessarily vary with access to the computer.

- ii. **Gender.** More men than women have access to computers and the Internet.
- iii. **Age.** People aged below 54 years dominate access to computers. Indeed, none of the people in the age category 65 years and above had access to a computer.

Only people aged 54 years and below reported having had access to Internet facilities, and those aged between 35 and 44 years dominated access to Internet facilities. None of the people aged 55 years or more reported having had access to the Internet.

- iv. **Level of education.** Respondents with university level education reported the highest access (83.3%), while people who had only adult or primary school education had no access to a computer. Although some of the people who reported having no formal education indicated that they have access to computers, the general trend suggests that access to computers is a function of some desire for them and this is dependent on having a level of basic education and skills.

Most people who sought use of the Internet were drawn from university graduates (83.3%) and those who had attended some post-secondary training (28.6%).

- v. **Economic activity.** Most of the people that were engaged in self-employment, including petty trade, had more access to a computer (16.4%) than those in wage employment (13.2%) or in farming (4.2%). Given that the majority of the rural people engage in farming, there is therefore very limited access to computers in the rural areas.

The Internet seemed most accessible to people engaged in wage employment (40.6%) as compared to those in self-employment (25%) or in farming (2.5%). This could be attributed to that wage employment might also avail such facilities as the Internet, especially in rural settings.

- vi. **Income level.** Most people who reported having access to the Internet had some of the highest incomes within their settings.

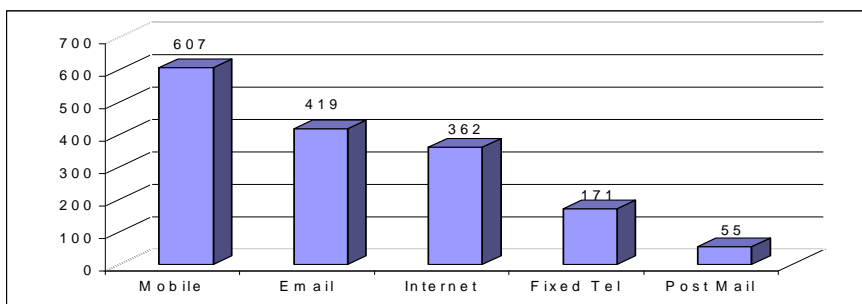
(e) Broadcasting services

- i. **Region.** Generally, radio services are accessible to the majority of rural households. All regions except North Eastern Province reported good reception, while Coast and North Eastern provinces reported less widespread access to radio. Nyanza and Rift Valley provinces reported the highest proportions of the population with access to television while North Eastern reported no access.
- ii. **Gender.** More men than women have access to radio and television.
- iii. **Age.** People aged 75 years and above enjoy the lowest levels of access. Similarly, most people with access to television are young.
- iv. **Economic activity.** People engaged off-farm either in wage or self-employment had higher access to radio and television than those engaged in farm activities.
- v. **Income level.** People in relatively higher income levels dominate access to television and radio. People with more than KShs. 9,000 per month however had 100% access to radio while with more than KShs. 20,000 enjoyed 80% access to television.

5.2.3 Expenditure and Affordability

One of the key limitations to engaging fully available communication services is the cost involved vis-à-vis the rural economy. Currently, the volume of money that goes into various communication services is small, largely because the users do not envisage direct economic returns. Figure 5.4 shows the money rural people spend per month on listed communication services. However, compared to general incomes the above expenditures are relatively high.

Figure 5.4: Average amount of money spent on each service per month (KShs.)



The following are additional points on expenditure and affordability:

- **Courier services.** The maximum expenditure on courier services went as high as KShs. 1,500 a month in a few cases. The majority however reported spending KShs. 20 on letters.
- **Courier services.** Most people spend about KShs. 100 for the service.
- **Internet services.** Internet users spend between KShs. 50 and KShs. 1,800 per month. Further analysis shows that majority spend KShs. 200 per month on Internet access.

E-mail communication costs on average are KShs. 420 per month, and some of the people spend up to KShs. 1,800 a month.

In response to a question on the amount of money spent on fax most recently, the majority cited KShs. 100 although this went as high as KShs. 500.

- **Fixed telephone services.** Expenditure on telephone calls goes up to KShs. 3,500 a month. One fifth (17%) of the population indicated that they sought reverse calls.

Over four fifths of the households are still on the post-paid billing system. Interestingly, none of the households with a fixed telephone line make a choice between peak and off-peak calling time. Furthermore, over three-quarters of these households stated that they find the current charges affordable.

- **Mobile telephone services.** The majority rural people spend only KShs. 100 per month although some of the respondents reported spending up to KShs. 10,000 per month on mobile telephone calls. This suggests a great variance in the spending patterns of mobile telephone users.

It was also observed that more than 40% of mobile telephone users reverse charges on their out-going calls by "flashing", in an attempt to have the receiver pay for a call. Less than one third of the mobile telephone users however make a choice between peak and off-peak calling times. Instead, two thirds of mobile telephone users make a telephone call just when they need to irrespective of variations in tariffs; although the mobile telephone is used to socialize, not many people make the effort to do so when it is cheaper. This is partly because the off-peak period is often impracticable in a rural setting and quite unacceptable to people who must make the facility available.

Mobile telephone owners reported having spent an average of KShs. 6,950 on their sets, with the majority spending KShs. 6,000. The expenditures however were diverse with some people spending as little as KShs. 2,000 while others went as high as KShs. 27,000. According to information from group discussions, the type of handset one wishes for dictates these expenditures.

The money for the purchase of a mobile telephone set was raised mostly through personal savings (76%), family support (20%) or through the employer (4%). About 7% of the respondents raised the money through merry-go-rounds.

Almost all subscribers fund their airtime through own savings (95%). A few however depend on the employer (2%) or gifts (3%). access and actual utilization of the mobile therefore is dependent on the profitability of one's economic engagements. As long as rural incomes remain meagre, the use of the telephone as a means of communication will be limited and sporadic.

Airtime denominations

Most people purchase airtime in small denominations with the majority falling in the KShs. 250/ KShs. 300 range (86.7%). Moreover, close to one in every ten subscribers uses the KShs. 100 denomination. A few respondents (4.3%) reported that they usually purchase airtime on the KShs. 500/ KShs. 600 denomination and, none of the rural subscribers reported using higher denominations in the ranges of Kshs. 1,000 and above.

The amount of airtime purchased at any one time is a reflection of income levels and, to a limited extent, availability on the market. Group discussions revealed that the KShs. 100 denomination is not readily available because it is dependent on a powered dispenser. Given the nature of rural incomes and especially the sporadic manner in which money trickles in, it would help if service providers could introduce community phones or airtime denominations that are in line with this reality.

5.2.4 Demand and Utilization

One key characteristic of the utilisation of communication services in rural Kenya is staggered usage. The mobile telephone is the most widely utilized service as shown in figures 5.5 and 5.6. Both the radio and television also reported relatively high usage and on a daily basis as shown in figure 5.7.

Figure 5.5: The percentage of people that receive messages on listed service within a month

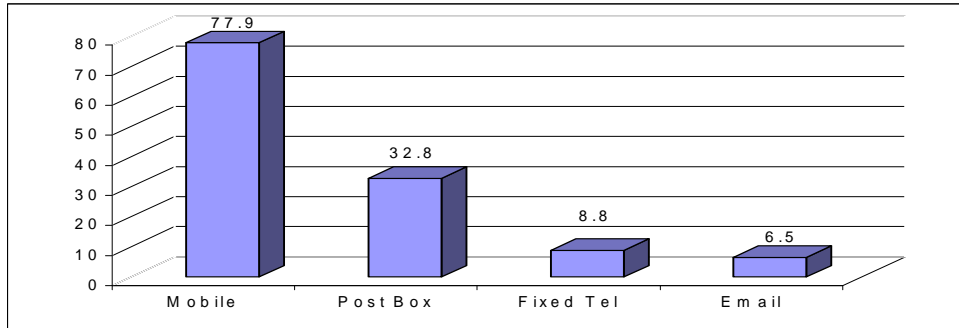


Figure 5.6: The percentage of those with access that sends messages on listed service within a month

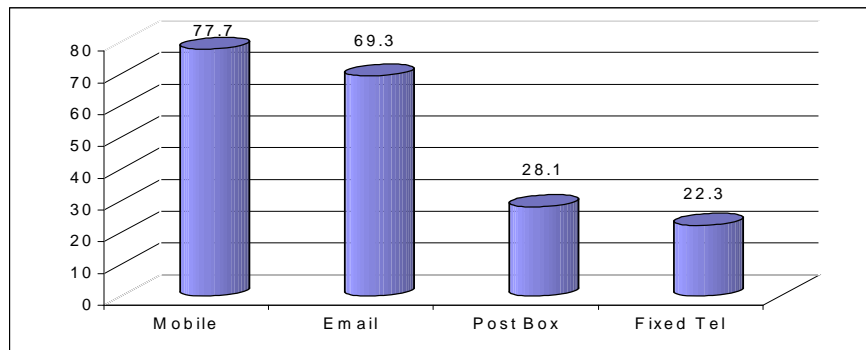
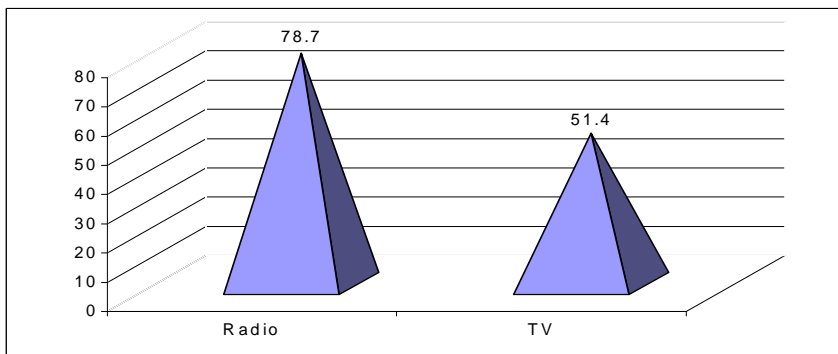
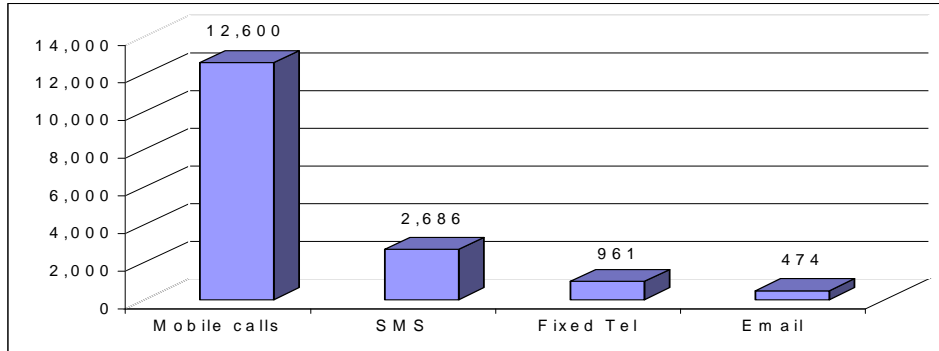


Figure 5.7: The proportion of people that listen to radio and those that watch television daily (%)



Indeed, an analysis of the average number of transactions shows that in a month mobile telephone calls amount to about one call per day. Both the email and SMS reported less than one message per day for the same period of time. The fixed telephone is the most inactive of them all with an average of one call for every five days. Cumulatively, the mobile telephone reported the highest volume in terms of number of transactions, as compared to both the fixed telephone line and e-mail as shown in figure 5.8.

Figure 5.8: Total number of in-coming messages per month by communication type



The above consumption pattern suggests that the listed communication services are either not readily available or, they do not constitute a core facility to every day life in rural Kenya. A search for answers to some of these concerns therefore means that both cost and availability determine how frequently communication services can be sought. As such, the desired movement towards universal access will have to approach the rural areas from two fronts. One is investment in advocacy campaigns to make the people aware of the range of communication services available and the potential benefits that they offer. The second and probably more important is to ensure that these communication services are readily available and economically accessible.

Choice of content

One possible reason why various communication services appear under-utilised has to do with the range of uses into which the people put these facilities. Unfortunately, some of the relatively more available communication facilities do not feature in business transactions. For instance, only 19 percent of mobile phone communication focused on business transactions, and this was the case for 16 percent of fixed telephone line users and a mere 8 percent of post office box mail.

Instead, a considerable proportion of the business transactions were conducted using the fax (68%), courier (48%), email (35%), and Internet (24%), all of which were reported as relatively unavailable or limited as shown in figure 5.9. Similar trends are observed with regard to sending of emergency messages. Interestingly, communication facilities that are relatively available are often used to pass messages of a social nature as shown in figure 5.10.

Figure 5.9: Out-going business transactions per month by mode of communication (%)

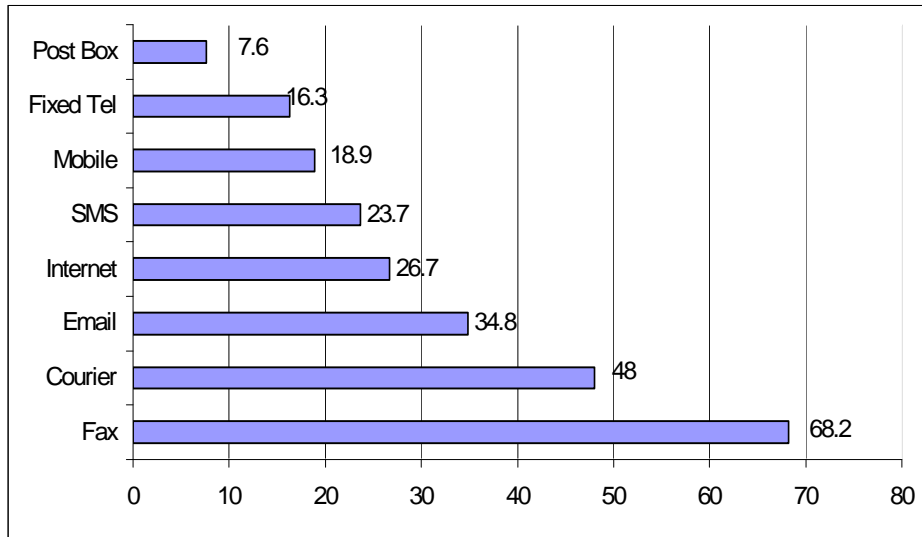
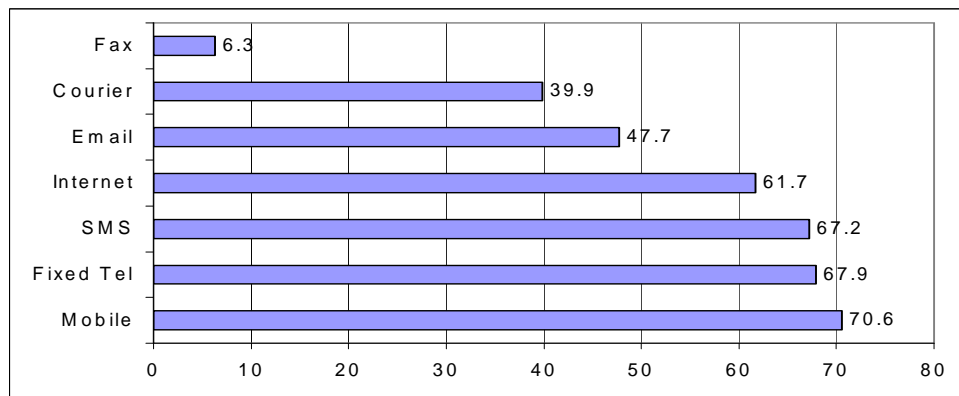


Figure 5.10: Out-going social transactions per month by communication type (%)



Therefore, in addition to making communication services readily available, it is also necessary to re-consider whether the current uses into which people put available facilities are sufficient or, there is need to introduce other possibilities. The second alternative is to work towards merging the two considerations by making communication both social and economically productive. This means that in addition to fulfilling a social need such as inquiring into the general well-being of relatives and friends, rural communities should be encouraged to apply these services in transacting their many economic engagements. Some of this would require exposure and making the services universally available so as to complete the circuit.

5.2.5 Knowledge of Services

- **Mobile telephone.** About 86% of the respondents indicated that they knew what a mobile telephone is. This widespread knowledge could be attributed to the captivating nature of the mobile telephone technology that makes its presence in any rural neighbourhood easy to tell. Nevertheless, 14% of the rural population had no idea “about” the mobile telephone. At the same time, over 60% of the respondents who reported knowledge of a mobile telephone were not in a position to operate or use one.
- **Computers.** Of the rural population, 42% had knowledge of a computer. Close to two thirds of the people first saw a computer at their shopping centre, the bank or work place. The rest named diverse places including public institutions such as schools, hospitals, and business premises. Only about 1% of the population reported owning a computer at home. Only one in every ten of the people with knowledge of a computer has ever used one, however.

Respondents advanced several reasons for never having used a computer. Close to 42% stated that this was because they were illiterate, a pointer towards some of the basic requirements for the advancement of technology and its application. Similarly, 25% of the respondents had not used a computer because they lacked basic skills, mainly how to operate one. A further 25% of the rural population had never used a computer because the facility was not available to them and it was not readily affordable. Interestingly, one in every ten people had never used a computer because they have not found need for it.

- **Internet.** Only one in every ten people among rural dwellers had knowledge of the Internet (9%). A large number of people (91%) did not know what the Internet is. This limited knowledge shows that most rural dwellers are locked out of, and anything linked to, the Internet.

Moreover, only 21% of the population with some knowledge of the Internet had ever accessed it. About two thirds of them were able to access the Internet without assistance.

- **E-mail.** Over 98% of the population had no email address. This group stated that it lacked the necessary knowledge and skills to operate the email facility. Some of this knowledge was limited to the email facility itself, while in some instances it included having no knowledge of computers or lacking in basic literacy.
- **Broadcasting services.** Over 56% of the population knew about both the radio and television; 41% knew about the radio and (2%) only knew about the television. Some rural dwellers however did not have knowledge of any broadcasting services (1%).

5.2.6 User Preferences

5.2.6.1 Postal/Courier Services

a) Postal Services

In response to a question on the postal services that they have ever sought, the majority of the people reported that they used the post office for postage (56%) and for money orders (18%). Only a few used the post office to send urgent messages through telegrams (10%) or speed post mail (3%). One tenth of the people (7%) reported having used the post office for sending parcels, checking mail, or for banking. Some households had never sought any service from the post office (4%).

These consumption patterns seem to suggest that postage is the most sought-for service among rural dwellers. While this may suggest that the services currently available reflect dominant needs; it is also the case that the people have only learnt to live with the limitations. That telegram services are reported as one service that was last sought for despite having been discontinued over two years ago is further suggestion that postal services are seldom sought.

b) Courier Services

A small number of households had ever received a parcel/mail through courier services. Slightly over one third reported having received cash money (37%) while the rest had a variety of items such as clothing, medicines, books, posters, food, and official documents. Other parcels contained messages on social issues.

That over one third of courier transactions involve the transfer of money is indicative of what the people consider as urgent and what possibly requires a different mode of communication. It is also an indication that other forms of transfer such as provided through banking do not suit some rural dwellers.

5.2.6.2 Fixed Telephone Services

Location of Services

Households that preferred having a telephone facility within their home explained this in terms of proximity and associated privacy, security, and convenience. A few people reported that the home was preferred because of the prestige associated with owning a telephone line. Besides the functional role performed by the telephone, therefore, access and ownership of the facility is also a status symbol.

Besides homes, some of the households (49%) suggested that they would prefer having a shared telephone facility. In response to a question on where in particular they would want the telephone facility located, over three-quarters of the respondents cited the market/shopping centre. The rest named the school, health centre, church, chief's office, or coffee factory.

That a considerable proportion of rural households are willing to share telephone facilities provides a window of opportunity for the public sector and any other investor. This means that public institutions and market places provide a potential location for these facilities. That the majority would want the facility located at home however shows that distance is a key concern; thus, public provision must be accompanied with choices and options.

5.2.6.3 Broadcasting Services

Many radio stations are now operational in the country. The rural population reported that it was able to access up to thirty different radio stations, including some that broadcast from outside Kenya. The KBC National Service was the most cited, followed by Radio Citizen, KBC Regional Service, and the British Broadcasting Corporation (BBC). Internationally based sources go as far as Tanzania, Uganda, Somalia, Saudi Arabia, South Africa, Djibouti, and Zanzibar.

The KBC National service emerged as the most favourite radio station among rural dwellers. Other choices included Radio Citizen, Inoro, KBC Regional and Radio Ramogi. Choice of a favourite radio station was mainly based on an ability to understand the language, the quality of the presentation and the variety of programmes, the level of entertainment, the focus on current affairs, announcements, and general information. Other stations were favoured for their good reception, their ease to tune into, their being educative, interesting, open, truthful, or just available.

Respondents cited a variety of radio programmes they considered their favourite. These included general news, announcements, business, entertainment, greetings, family affairs, and politics. A number of these programmes were considered favourably because they are informative, entertaining, and educative.

Generally, most people do not face a problem in deciding among family members what radio programmes to listen to. This suggests that households have shared interests or the line of authority with regard to sequencing of programmes is clearly spelt out.

5.3 Recommendations

The baseline survey has shown that, access to communication services in the rural parts of the country is skewed to those who can afford and those within easy reach. It is also apparent that education, literacy skills, and, in particular some operational knowledge is necessary. The challenge therefore is to devise methods that can make it possible to reach the not so easy to reach, mainly the poor, the elderly, the illiterate, and the regionally marginalized. We have seen from the

various group discussions and survey statistics that economic empowerment is central to improved access to communication services. The following would therefore constitute a way out in reaching the hard to reach:

- a) Improve rural incomes and in particular work on ensuring that the economic activities that people engage in have fair returns.
- b) Improve physical access through making communication services actually available by reducing the distances covered to the nearest facility.
- c) Encourage campaigns to make rural people aware of the communication services available and the impact it can have on their livelihood.
- d) Make available necessary basic knowledge and skills to operate various communications equipment.
- e) Diversify the languages used in the operation of these communication services to include regional languages and Kiswahili.
- f) Make deliberate efforts to subsidize the rural parts of the country in order to make access to communication services affordable.

In many ways, therefore, reaching the rural parts of the country will require concerted efforts that must pay attention to the diverse needs of the populations. While it is necessary to ensure that communications in rural Kenya become more and more important to the rural economy, it is also the case that social issues must continue to be catered for. It is therefore imperative that UA to communications should not be used to erode the positive aspects of the prevailing rural culture, such as the need to inquire into the well-being of family and friends.

6. UA and Interconnection Studies and Recommendations

This chapter summarizes the findings of the UA studies in Kenya, Uganda, and Tanzania, focusing on UA policy and experiences, regulatory framework for UA, funding and sustainability of UA, indicators and targets of UA and ability to meet the targets, and desirable institutional framework to administer UA. The chapter also makes recommendations with respect to the UA studies in the East African countries. The second part of the chapter discusses interconnection guidelines, principles and models based on an interconnection study. The chapter ends with recommendations, an implementation plan for these recommendations and a framework for an interconnection booklet.

6.1 UA Studies in East Africa

Data for the UA studies in the three East African countries was collected as follows:

- Letters were written to the chief executives of the organizations chosen in a purposive sample of two key groups of respondents: operators and regulators and policy makers.
- Appointments were sought with the identified respondents through telephone. Where a chief executive was not available, he or she would nominate the person to be interviewed.
- Data was collected through interviewer-administered questionnaires.

Responses from the two groups of respondents were combined, question-by-question, in a spreadsheet. The frequency of each response and pertinent comments made by the respondents were analysed and placed in separate columns. The spreadsheet was scrutinized to reveal the synthesized findings or results. These results were then used as the basis for the conclusions and recommendations.

6.1.1 UA Policy and Basic Services

Uganda established a rural communications development policy in 2001. This policy however excludes broadcasting; the Uganda Broadcasting Council (UBC) is responsible for the country's broadcasting policy. The Ugandan rural communications development policy defines basic communication services as a package that includes **"voice grade access to public telephony networks and public access to where stamps can be bought, and where letters can be posted and collected"** (Rural Communications Development Policy for Uganda, July 2001).

In Tanzania, the UA initiative was seen in the context of sector liberalization and privatization process and was championed by the country's Presidential Commission on Parastatal Reform and Privatization Commission to the exclusion of both the regulator and ministry in charge of communications. The regulator, who is the main implementer of UA programmes, was consulted at the end of the process. According to the Ministry of Communications and Transport, aspects of UA are incorporated in the broad outline of the national telecommunication policy and the national ICT policy.

Tanzania's national postal policy was approved in 2003 with UA given prominence. Strategies were being worked out on the implementation of the policy at the time of the study (May 2004) and Cabinet approval was soon to be sought thereafter.

Kenya does not have a UA policy, except for the general statements contained in the 2001 Telecommunications and Postal Policy Guidelines and the provisions for UA in the licences of operators, in terms of coverage and roll-out targets. Both the policy guideline and the coverage and rollout obligations however only apply to the telecommunications and postal services. Operators in broadcasting have no licence conditions²³, while the IT sub-sector is a "free-for-all" area with no regulation and standards.

The Kenya study found that basic communication services should be defined as a package that includes public access to telephony, Internet, multimedia, radio and television signal, letter, philatelic, and private letter boxes. This package of services should be accessed through telecentres or other public/community centres, cyber cafes, public/community telephone payphone booths, or postal outlets²⁴. Most respondents were of the opinion that services would be available from a combination of these access points, depending on particular areas. In addition, there should be individual access for people who can afford.

6.1.2 Targets

The Uganda Rural Communications Development Policy has targets for US. The key targets are:

- all sub-counties with at least 5,000 inhabitants to have access to basic communication services by 2005
- an Internet point of presence (public Internet café) in every district by 2003

²³ The exception is the KBC which is mandated by the KBC Act to provide broadcasting services to all Kenyans.

²⁴ With the proposal to remove restrictions on VoIP by CCK, making calls in the rural areas will become that much cheaper from community-based cyber cafes. Indeed, there will be need to harmonize the government's duty on mobile telephone call air time. Perhaps a move to abolish it might be more appropriate, which will in turn make mobile telephone calls cheaper.

- ICT use and capacity building (training, management and maintenance services) in at least one “vanguard” institution in every district by 2003
- one postal outlet for every 5,000 people

At the time of the study in early 2004, indications were that the indicators had not been achieved.

In Tanzania, the following were the key targets for achieving UA to communications:

- a payphone in every village with more than 3,000 inhabitants by 2020
- a teledensity of 2 telephones to every village by 2020
- a departmental postal outlet at every provincial and district level; where it is uneconomical and unviable, the Tanzania Postal Corporation would agree with the Tanzania Communications Regulatory Authority (TCRA) on how best to provide services to such areas

In Kenya, the indicators and targets for the next five years are shown in Table 6.1 below.

Table 6.1: Indicators and Targets for Next Five Years

Sub-sector	Indicator	Current position	Target in 5 years
A. Availability			
(a) Telecommunications	Fixed teledensity	About 1.0	10
	Mobile teledensity	8.0	20
	Percentage of population coverage by GSM signal	< 40%	90%—100%
	Number of fixed telephones per 100 households	1.69	Five
	Number of Internet users per 100 inhabitants	4.4(estimate)	20
(b) Broadcasting	Percentage of population with a television signal	65%	80%—100%
	Percentage of population with a radio signal	95%	98%--100%
	Percentage of households with a television	17.1%	40%
	Percentage of households with a radio	87.2%	95%
(c) Postal	Number of inhabitants per postal outlet	36,365	20,000
	Number of post office boxes per 100 inhabitants	1.25	Five
(d) IT	Number of PCs per 100 inhabitants	0.65 (2003)	Three

Sub-sector	Indicator	Current position	Target in 5 years
B. Affordability	Percentage of annual disposable income on communication services	Not available	1.5%—5%
C. Accessibility	Location of public or community access points	Administrative centres	Divisional headquarters
	Distance to nearest public or community access point		Walking distance, Every five to ten kilometres
D. Level of Service	Basic or practical services	Not available in all rural areas	All basic or practical services available in rural areas
	Grade of service (GOS)	Poor GOS in urban and rural areas	Similar GOS in urban and rural areas--but GOS could be degraded in rural areas in some instances to increase coverage and availability

6.1.3 Institutional Framework

In Uganda, there is a dedicated and separate Rural Communication Development Fund (RCDF) unit within the Uganda Communications Commission (UCC). The key aspects of this institutional framework are summarized below:

- The unit's role is to manage the RCDF programme and activities.
- The RCDF unit has three staff, who are employees of the UCC but who are fully dedicated to the work of the RCDF. The unit is headed by a Fund Manager, who is appointed by the UCC and has the rank of a Head of Department in the UCC. The RCDF unit is allowed to request secondment of the UCC staff on a part-time or limited full-time basis for special assignments. The RCDF can hire consultants to perform tasks defined by the RCDF Manager.
- The UCC provides advisory and technical support for project execution and evaluation.
- The unit has a separate RCDF Board, whose function is to monitor and approve RCDF's programme and activities and to monitor its financial activities. The Board has representation from the UCC, the communications sector, the financial sector, consumer organizations, the Institution of

Professional Engineers and the Ministry of Communications. The Board is accountable to the UCC and must work within the UCC policy and regulation.

The key reason for a separation of the RCDF from the UCC is to enable the RCDF access funding from other sources outside the ICT sector and not be constrained by the UCC provisions. It is on this premise that the World Bank offered US\$ 5 million in support of the RCDF.

In Tanzania, any UA implementations have been overseen by the regulator. Most respondents however preferred an independent agency outside the direct control of both the regulator and the Ministry to be in charge of UA to communications.

The Kenya study found a preference for a unit within the CCK to be in charge of UA as the appropriate institutional framework (as in Uganda). It also found support for this unit to have a separate board with representation from key stakeholders. The key reasons given for this choice, which represents part of the operating principles for institutional framework, were the need for:

- a balanced stakeholder representation, especially for the private sector
- independence and autonomy
- efficiency, effectiveness, and transparency

For the proposed institutional framework to work effectively, respondents cited the following as critical factors:

- independence, transparency, and accountability (especially in the management of funds)
- balanced stakeholder involvement
- clear and diversified funding mechanism
- legislative authority backing
- clearly specified objectives and functions
- quality of the board
- rationalized UA fees (vis-à-vis other license fees)
- clearly defined indicators and targets of performance guidance
- capability and integrity of the persons hired
- clear rules for procurement and disbursement

6.1.4 Regulatory Framework

The Uganda Communications Act provides for the funding of the RCDF and provides for a maximum levy of 2.5% on operators as a contribution to the RCDF. The minister responsible for communications however set a 1% levy after discussion

with operators. Within two years, the UCC had collected between US\$ 3—4 million; the UCC collects the funds and passes the funds to the RCDF unit.

The broadcasting sector is not included in the UA framework but controlled under the Electronic Media Act, which established the Broadcasting Council to advise the minister on information policy issues.

Tanzania does not have explicit provisions for UA in the relevant telecommunications laws. To provide a legal framework for UA, operators proposed:

- amending the relevant telecommunication laws to provide for UA implementation and enforcement; the laws should provide for subsidization of rural operators
- empowering the TCRA to collect levies from operators for the fund
- providing a mechanism for the coordination of all UA matters; contributors should be involved
- providing for penalties for non-compliance of laid-down licence obligations

In Kenya, the KCA 1998 has very weak provisions for UA²⁵. There was preference for changing this act to provide explicit provisions for UA. The main reasons behind this argument are that the act is fairly good and it will take a shorter time to amend it than to create a new one. Some respondents were however quick to add that this amendment need only be a short-term measure. In the medium term, a new act that integrates all the communication services is required while a move towards self-regulation might be a useful long-term direction.

A significant number of respondents preferred a new, focused and efficient legislation that integrates the sub-sectors of telecommunications, broadcasting, postal and IT immediately. The key reasons necessitating this were given as:

- The KCA 1998 has several other problems that need to be addressed, for example, the potential conflict of interests for members of the Board of Directors of the Commission appointed from industry.
- The current legislation does not address broadcasting and IT. With the convergence of the underlying ICT technologies, it does not make sense to have separate legislations.

In early 2004, broadcasting stakeholders were discussing a draft broadcasting bill. When the Minister for the new Ministry of Information and Communication was

²⁵ This Act does not cover broadcasting, and indeed broadcasting does not have a legal framework.

appointed by mid-2004, he however shelved the draft bill. It is hoped that a new legislation will be created to take care of all the communication services.

Most respondents were clear that this new legislation would by necessity imply a single regulator. This has happened in other countries, including the neighbouring Tanzania.

6.1.5 Financing

The UCC established the RCDF as the main mechanism of funding rural communications. Its key sources of funds were from an initial endowment of US\$ 400,000 from the UCC from its national operator license fees; 1% levy of the gross revenue of telecommunication operators, postal and courier operators and ISPs; and development partners. The World Bank provided US\$ 5 million towards the fund.

During the study, respondents however indicated that the RCDF funding mechanism was not sustainable. Most respondents felt that it would be very difficult to sustain subsidies unless the rural communication projects being funded using the fund generated some money.

Tanzania does not have a mechanism for funding UA to communication services. Most respondents however favoured a combination of a fund (with the government and operator levies at 0.5% of gross revenue) and incentives.

Kenya does not have a mechanism to fund UA²⁶. Most respondents however chose a **central fund** as the main mechanism to fund UA to communication services. The main reasons for this choice were:

- A central fund has diversified sources of funding, including development partners and well-wishers, the government, telecommunication operators and service providers, broadcasters, postal/courier operators, and so on²⁷.
- It is a one-stop place for all contributions.
- It has been used in other countries.
- It is most suitable given the convergence of technologies.
- Operators are paying fees and are willing to make contribution.

The second most popular mechanism is **incentives**. The incentives mentioned during the data-collection exercise as well as during the workshop include:

²⁶ For a long time, UA was supposed to be achieved through roll-out and coverage obligations by national operators. This however became difficult to sustain as telecommunications became more liberalized.

²⁷ Most operators however indicated that they would accept a central fund as long as there was equity in contributions and openness in the operations of the institution to administer the funds, or there is a benefit (for example, the contributions are tax-deductible).

- more efficient and transparent allocation of frequency spectrum
- more simplified and faster processing of licence and frequency spectrum applications for rural areas
- reducing the cost of licences and frequency fees for rural operators
- reducing import and other taxes for equipment (for example, base stations) and operating infrastructure required in the rural areas
- giving grants for employment creation in the rural areas

With respect to levies on operators and service providers, the main reactions were:

- Annual operating fee for telecommunications operators should go up. The total levies however should not exceed 1—2% of gross revenue. At the same time, the fees charged should be bench-marked with funds in other countries, for example, Uganda (1%), Peru (1%), and Columbia (2%).
- The CCK should rationalize operating and frequency fees. The new rationalized fees, of which a major part should fund UA, should not exceed the current total of operating fees plus frequency fees.
- The government should earn money from taxes and not more levies. The government should therefore fully liberalize the communications sector and earn taxes from operators and in turn use these taxes for to fund UA.

6.1.6 Key Challenges

In Kenya, the key challenges to providing reasonable access to communication services in the rural areas were:

- There are regulatory limitations, especially the regulation of a technology (for example, VSAT) and highly disaggregated market structure²⁸.
- There is lack of resources to invest, especially given that most areas are not commercially viable.
- The TKL Internet infrastructure penetration is limited, especially for ISPs and public data network operators.
- Commercial orientation by operators, leaving out less commercially attractive rural areas.
- There is lack of power in most rural areas.
- There is a limited frequency spectrum, especially for broadcasters.
- Tariff for TKL trunks is very high.
- High frequency fees, especially for operators providing services in the rural areas, are charged.
- There is limited bandwidth.

²⁸ This was however addressed by the new licensing framework released by the CCK in September 2004.

- There is limited capacity of rural people to afford services and high levels of illiteracy, in turn limiting the effective demand.
- There is lack of a national ICT policy.

6.1.7 Interconnection in Uganda and Tanzania

At the time of the study, there were no rural operators in Uganda but these were planned to be launched as part of the UA implementation. Interconnection framework was being considered as a tool to ensure sustainability of rural operators. Both the UCC and the RCDF indicated that the World Bank 2004/2005 project provided a funding component for a study on asymmetrical interconnection and the development of operator tariffs to favour rural-based operators.

Among operators, the views and proposals on the concept of asymmetrical interconnection differed widely. ISPs and data operators, for example, recognised that there are peering arrangements among ISPs but these are not on commercial basis. Each ISP sustained its link from its gateway to the IXP. "Rural operators can be subsidized to peer locally at the IXP and any urban based IXP can have favourable peering arrangements with rural ISPs", one ISP noted. Rural ISP-based operators therefore can be supported to peer at the IXP through, for example, preferential bandwidth charges for rural-based content developers.

Tanzania did not have an interconnection model. Many telecommunications operators proposed:

- the need to define an interconnection model to apply after the exclusivity period of the Tanzania Telecommunication Company Limited was over
- the regulator to determine interconnection rates with a specific timeframe based on commercial principles agreed upon by all stakeholders
- interconnection to be driven by operators based on a UA strategy

Interconnection in Kenya is discussed in section 6.2.

6.1.8 Recommendations

- a) UA should be a partnership of all rural stakeholders.
- b) Conducive policy framework and legislation are the key to attaining UA targets. Political will is critical on the part of the government and for the private sector to gain confidence in participating in UA. The government's support and intervention are needed if UA is to be realized and sustained.

- c) Asymmetrical interconnection promises a sustainable funding within the ICT sector for rural areas and should be implemented. A well-designed framework accepted by the operators can run with little supervision from the regulator hence releasing the regulator to focus on other issues of rural development.
- d) The private sector should be involved in developing targets and indicators. If it is not involved, the indicators will fail to capture its dynamism and innovation of. The indicators themselves should be technology neutral to allow operators choose the technology to realize the targets.
- e) The institutional framework responsible for UA and its autonomy should be legally established. This will enable the agency to both focus on long-term government policy without undue influence and be operationally independent. Key stakeholder interests should be represented in this agency.
- f) Based on the targets to be achieved, the cost of UA should be ascertained and reviewed periodically. This provides a framework to solicit funding within and outside the communications sector. As noted in Uganda, a fixed percentage of gross revenue alone may be inadequate.
- g) UA policy and project prioritization should be tied to the government's goals of development in the rural areas; this ensures synergy with the government's programmes. In the case of Uganda UA projects were ranked in terms of contribution to poverty eradication. Uganda's RCDF is part of a wider Energy and Rural Development initiative funded by the World Bank.
- h) Regionally based operators tend to relate with the regional social needs and develop visions and programmes that go beyond pure commercial considerations as a contribution to the community. This was noted in Zanzibar with Zantel. This would suggest UA strategies should give priority to empower regional or cooperatively owned ICT enterprises to service rural regions.

6.2 Interconnection Guidelines, Principles and Models

6.2.1 Introduction

Interconnection and UA are the main challenges facing governments and regulators. All countries are dealing with these issues, but in developing countries as well as in developed countries, the variety of models and strategies implemented here and there can only provide lessons with no possibility of a "cut and paste" approach. In the matter, not only one size doesn't fit all, but also no pre-designed size and customization for each country-specific situation is compulsory.

The difficulty is increased by the complex nature of the telecommunications sub-sector that is subject to fast, deep and multidimensional changes. In particular, the technological changes occurring in the sector require one to keep abreast of developments as the validity of previous well-thought strategy may vanish sooner than expected, inducing an appeal for constant adjustments or fixes.

The borderless-nature of telecommunication does not allow a single inside-country regulatory policy framework if optimization of the expected outcome is sought.

Interconnection regulation aims at contributing to the full implementation of a national overall development policy, and shall be socio-economic oriented. It is a dynamic process that takes into consideration at least the following features:

- the level of development of the sector
- the market structure
- the state of competition in the market—current and in the foreseeable future
- the market players and their respective powers in different defined market-segments
- the world trend in technology (mobile, internet, convergence of technologies)
- the world trend in regulatory policies: regional level (COMESA, EARPTO, and so on) and international level (WTO, ITU, WIPO, ICANN, ICC, and so on)

Given the responsibilities assigned to the CCK as well as the CCK's vision, mission statement, and commitments, the study focused on issues related to interconnection guidelines and principles, interconnection-cost models and the exploration of possible avenues for the implementation of UA.

The study and recommendations take into consideration the liberalization of the sector, inducing the necessity to rethink the market structure of the whole sector and the building of an interconnection regulatory framework that is suitable for the merging contestable market as it will foster competition.

6.2.2 Methodology

Interconnection regulation targets the establishment of a stable competitive market. There is therefore no need for regulation if the market is sufficiently mature to drive competition by itself. This however is of course an ideal situation and even developed countries in Europe and such as Canada and the USA and countries are still and continuously struggling to get their market to be competitive.

The literature abounds in facts and features pertaining to interconnection regulation; it is impossible in this report to address all relevant issues exhaustively. It however appears that the more interesting feature worth looking at tends to be interconnection regulation that targets Open Network Provisions (ONP) as recently directed by the EC to EU member-countries; how to move from a monopoly

regime to competition, hence facilitating entry of new operators to compete with incumbent operators as this is the case in many countries; how to ensure the sustainability of a competitive market in preventing dominance abuse and implementing remedies when and where necessary. How interconnection regulation can help implement US obligation in general and achieve UA, in particular providing affordable communication services to disadvantaged social groups or communities.

Considering the above context, as well as the CCK's vision, mission statement, functions, objectives, and role, as well as putting the Kenyan case in perspective, the study reviewed practices conducted in the developed countries (in Europe and such as the USA and Canada), in some emerging countries (CITEL's member countries, APEC), and in African LDCs countries (Nigeria, Mali, Burkina Faso). The study was also based on interviews conducted with key stakeholders in the Kenyan telecommunications sub-sector as well as review of materials provided by the CCK.

6.2.3 Interconnection Guidelines and Principles

Clear and detailed pre-defined and binding interconnection guidelines and principles are very important in the interconnection regulation, for they provide the legal framework for interconnection agreement negotiations; the more detailed the guidelines and principles are, the easier and faster the negotiations will be, in addition to the limitation of risks of disputes and the facilitation of dispute resolution in the event.

There are many similarities between the "guidelines and principles" adopted by different national regulatory authorities (NRAs), but the following main observations are worth making:

- a) Few African guidelines, if any, result from a wide public consultation. In many cases, the draft results from conclusions of a working group purportedly created and/or from international consultancy and is thereafter adopted by the Cabinet's decree. This process may not take full considerations of the local market situation, and the reference to Cabinet for some Guidelines determinations (for example, a major operator) may not fit in with the requirement of pro-active regulation for a sector that is subject to frequent and deep changes leading to compelling adjustments; this may be an indication of the level of independence of the NRA. Best practices of public consultation in the interconnection regulation and the drafting of guidelines are provided by European Community, and European NRAs are invited to make necessary adjustments of their national regulation policy to comply with the regional framework. UKOfcom is a leading example worth learning from.

- b) While it is understood that the guidelines aim at supporting the emergence of competition, they are not supplemented with relevant guidelines such as criteria for market assessment, dominance assessment, guidelines for tariff and price control, and so on.
- c) The responsiveness of the NRA is critical for the effectiveness of interconnection agreement (IA) negotiations and the implementation (date of effect).
- d) Imposed time to conclude IA is important and varies between 60 days and 90 days.
- e) Dispute resolution procedures and mechanisms do not consider alternative resolution mechanism such as arbitrator mediation, reference to previous similar cases that have been solved, and so on.
- f) Where obligation is made to the “major operator” or dominant operator to publish a Reference Interconnection Offer (RIO), there is no provision for penalties or sanctions in cases of non-compliance.
- g) Few guidelines address issues of consumer’s protection such as billing-details for consumers; billing often pertains to the reconciliation of traffic exchange between interconnected operators.

The following observations can be made on Kenya’s interconnection guidelines as contained in the Communications Regulations, 2001:

- a) The CCK’s interconnection guidelines (GIs) provide special conditions imposed to major operators like most African GIs. Nigeria’s GIs, for example, provide a section addressing obligations imposed to dominant operators in the market. Similarly, EC directives on Access and Interconnection, CITELE²⁹, APEC and TRASA have particular conditions imposed to dominant operators, consistent elsewhere with the WTO reference paper.
- b) There is no section in Kenya’s GI dedicated to the “major operator”. In particular, major operators are not explicitly required to publish a reference interconnection offer. Subsequently, the minimum list of issues to be included in an RIO is not determined.
- c) The different telecommunication services³⁰ are published in the CCK’s Website and the CCK plans to introduce price caps to regulate TKL’s fixed line tariffs.

²⁹ APEC Principles of Interconnection: <http://www.apectelwg.org/apecdata/telwg/interTG/principi.html>.
General information on interconnection in APEC region: <http://www.apectelwg.org/apec/atwg/pritgtgr.html>
CITELE interconnection best practices:
<http://www.citel.oas.org/pcc1/guidelines/guidelines%20and%20practices.doc>

³⁰ [Click here for new tariffs for Telkom Kenya](#)
[Click here for tariffs for KenCell Communications Limited](#)
[Click here for new tariff structure for Safaricom Limited](#)

- d) Dispute resolution procedures as defined, may lead to frequent calls to the CCK for intervention and determination.
- e) Confidentiality is addressed, but parties entering into IA negotiations are not required to contract a confidentiality-agreement prior the start of negotiations.
- f) US obligations are not addressed.
- g) Penalties inflicted to defaulting operators are not predefined.

Given the number of players in the market, it is recommended that the CCK reviews interconnection guidelines as soon as possible.

6.2.4 Interconnection Cost Models and Access Pricing

Interconnection agreement is a commercial contract under which services are sold and bought. Pricing therefore becomes serious and in particular NRAs will impose the incumbent Telco to charge the interconnection service to the new competitor based on the cost incurred to produce the interconnection service. To comply with this requirement, a number of models have been developed and tested. These are outlined below:

a) Benchmarking approach

The price for the interconnection service is based on practices observed in similar economies. Unfortunately, this may not lead to accurate results for the following reasons:

- Similar economies are likely to be the neighbouring countries. A neighbouring country however may not be more advanced in the interconnection experience.
- Despite the similarity of the economies, there may be a great difference between the telecommunication networks and finding relevant benchmarks is rather difficult.
- The case of the developed countries does not fit for benchmarks for Africa.

Lack of suitable and accurate data makes this approach a bit difficult. In addition, information about prices is not often made public.

b) Bill and keep (Sender keeps all)

Within this arrangement, there is no transfer of money between the interconnected operators. Each operator bills, recovers and keeps the revenues. This approach is often used when there is an assumption that the traffic between two networks is even. This may be the case when two licensed operators start the business at the same time. This agreement however cannot be sustained when one operator is supporting additional costs of terminating calls from the other.

In most cases, it happens that immediately after starting operation, an imbalance of traffic generated between two operators triggers a dispute (for example, the case of the two mobile telephone operators in Botswana). In addition, this approach does not allow incentives to invest as each operator can access the other's network for free. On the contrary, it attracts other retail-firms that are making high volume of outgoing traffic (for example, telemarketers and ISPs [peering]) because those firms are not charged for call termination.

c) Price caps

Price caps are used to control pricing of monopoly services; if an incumbent operator who has a monopoly in a market is subject to a fixed rate of return, it will have the incentive to cross-subsidize competitive services with revenues derived from monopoly services. That means this incumbent can raise the prices of the monopoly services and lower the prices of the competitive services and hence deter competition.

NRAs would thus impose price caps on the monopoly services. Price capping is basically imposing a ceiling or cap, Retail Price Index (RPI), based on the prices of a selected group of services that are put in a virtual basket. The value is then adjusted with a reduction index (X) that can be the inflation rate, the operator's expected productivity, or the national consumer's index. The final charging reference for the incumbent to use is RPI-X.

The advantage of the price cap mechanism is that it forces the incumbent not to offset high returns in one service with low returns in another (cross-subsidy), but to have incentive to set profit-maximizing price in charging each service. This requires management efficiency.

The drawback is that because the cap determination is not based on a detailed cost analysis of the selected services in the basket, there is a risk to come out with a price cap that is either too low or too high compared to the actual interconnection cost. If the cap is set too high, then the competitors will subsidize the incumbent unduly. If the cap is too low, the incumbent may lose investment capacity. In the case of a publicly owned company, this means that national resources are being transferred to a private company without compensation. Put in another way, competitors are being subsidized with public funds. This may not be the intention in regulating the prices.

The CCK is planning to introduce the price cap to regulate TKL's monopoly tariffs of. It needs to consider tariffs of other monopoly services provided by other operators.

d) Revenue sharing

The revenue-sharing mechanism resembles somewhat the international accounting settlement regime. The revenue-sharing mechanism is arranged usually between an international operator and a local operator (for example, a rural operator) allowing the former to terminate calls in the latter's network. The international operator will reverse a fixed percentage of the revenue generated to the local operator. This mechanism is used between fixed and mobile telephone operators in the case the mobile telephone operator is under the Receiving Party Pays (RPP) regime. This option carries the risk of charging below the actual interconnection cost and in particular does not fit in the Calling Party Pays (CPP) regime.

e) In search for a better cost-based interconnection charging

All the four models outlined above carry the risk of coming out with pricing either too low or too high in comparison to the actual interconnection charges incurred. This seems to suggest a move towards cost-based models.

A cost-based interconnection charging has the following benefits:

- It is beneficial to the end-user as it allows full competition that pulls down the prices and fosters innovation. Cost-based charging is an obligation for dominant or SMP operators.
- It is beneficial to the operators as they will be able to run their businesses in the most efficient manner, provided that they have the relevant management skills for a competitive environment.
- Given that interconnection charges are among the heaviest operational costs for the operators, being charged for the service demanded is by far an important management factor.

With these considerations, operators, regulators, consultancy firms and researchers, and international organizations and institutions (ITU, World Bank, OECD, EC, and so on) are trying to design and test models of access pricing in search for the best solution of this problem. The international consensus seems to go for Forward Looking-Long Run Incremental Cost (FL-LRIC) models.

f) Forward Looking-Long Run Incremental Cost (FL-LRIC) model

The FL-LRIC model is based on the economic idea that for an efficient operator to survive in a competitive market, costs should match expenditure and investment. With the objective of measuring the cost of a hypothetically efficient operator and to derive interconnection costs, the model designs the hypothetical efficient operator to serve as a benchmark for the incumbent. The efficiency of such operator will lead it to maximize its profit in pricing its services.

The **forward looking** principle responds to the Current Cost Accounting (CCA) methodologies that deal with the replacement of assets either at the current cost, or (in most cases) at the value of a Modern Equivalent Asset (MEA), which can deliver the same output. It therefore disallows taking into account the current and past inefficiencies of the incumbent operator.

The **incremental cost** allows sufficient unbundling of services in order to determine the cost incurred for the production of an increment of a selected service. This is particularly important as operators with SMP are subject to an obligation to sufficiently unbundle their services and the related cost to avoid unduly charging new entrant for service or product not required for the interconnection.

The **long run** refers to the time horizon at which all, including capital, costs are variable. It is the time when the operator will have to change inputs in order to respond to changes in output (increase or decrease of output).

The method of costing the different increments differentiates non-traffic-sensitive costs (fixed costs) and traffic-sensitive costs (variable costs) and defines the recovery mechanism for common and joint fixed cost not directly attributable to increments (for example, duct and distribution main frame). These common and joint fixed costs are usually recovered through many types of mark-ups.

Two different approaches are used for building the hypothetical efficient operator in the FL-LRIC models:

- The top-down approach is based on the accounting data of the incumbent and cost allocation subject to causality between cost and service. The top-down approach may base its costs on the existent network topology, scorched node, or on a fully ideal conceived network topology to meet efficiency requirement (scorched earth). Cost allocation in the top-down approach applies the Activity Based Costing (ABC) method.
- The bottom-up approach is based on an engineered efficient operator and will be deemed to be a scorched node if the existent network topology is adopted or a scorched earth if an ideal topology is preferred.

Most NRAs adopt the bottom-up approach and allow the incumbent to test the top-down approach; the final decision will result from a reconciliation of the two outcomes.

The international community seems to have agreed on LRIC as the current best cost-based model for competition development in "contestable markets" and the literature is recording an increasing number of scientific publications on FL-LRIC topics. ITU/BDT has developed a tool ([COSITU](#)) to help LDCs implement the bottom-up model. It is also providing training for capacity building in this area.

The model has been tested in some African countries such as Burkina Faso, Côte d'Ivoire, Cameroon, Senegal, and Zambia.

Relevance of LR-LRIC for Africa and Kenya

There is a largely shared view on the potential of this cost-based model in competition development, its efficient application in Africa however requires the removal of some preliminary hurdles, which they are but are not limited to:

- The model is somehow at its early stage with regard to its kind and the nature of the sector it is applied to, and related sustained positive outputs are therefore yet to materialize. There are however some positive signs from the developed countries.
- The application requires upfront detailed and accurate information and data, which are not available in most African countries.
- For many countries, the state of the telecommunication sector may increase the difficulty in the implementation of the model or the output may not be realistic for local circumstances (the size of the country versus topology and the existing infrastructure).
- Many telecommunication companies, including incumbents, are under part or total control of foreign partners and this may bring in distorted commercial information.
- The implementation of the model requires being a powerful, independent and competent NRA. Many African NRAs are still too much under the government's control even for operational decision-making processes.
- Market definition and analysis and feedback from stakeholders including consumers' organizations, to public consultations are important to ensure effective regulation. This is yet to come in many countries.
- The lack of a regional organization with supranational power to help create a regional market does not help either.

Many African countries however have ex-ante regulatory measures and obligations imposed on the incumbent or on any SMP-operator. In particular, these obligations pertain to cost-orientation and cost-based interconnection charges.

In spite of the various constraints listed above, therefore, the FL-LRIC model of access pricing is worth introducing. Countries such Uganda and Tanzania have already contracted international consultancy firms to help their NRAs implement the model. Kenya has one of the fastest developing markets in Africa. Competition in the sector needs a further push to take the ICT sector to new heights, and to help Kenya play its deserved leading role.

6.2.5 Interconnection and UA

Interconnection charging has an impact on an operator's incentive to invest and/or to innovate. The interconnection charges however impact directly the access price for the end-user, thereby the implementation of the government's UA policy and strategy will largely depend on interconnection guidelines and principles.

a) Asymmetric interconnection

Back in the 1990s when the access technology was still dominated by the fixed telephone landline for voice telephony, the common strategy for UA was to grant through tender, a rural operator licence allowing the rollout of a rural network to be interconnected with the incumbent Telco's network, or the rollout and operation of payphones. A regime of asymmetric interconnection charging principle in favour of the rural licensee on top of an amount of subsidy from the universal service fund (USF) to cover losses was adopted. This scheme was sustained by the belief that the rollout and operation of rural telecommunications was a loss-making business.

The technological evolution now allows other means of providing voice communication services to consumers in a more cost-effective manner. For the sake of competition, asymmetric interconnection is to be envisaged more carefully as it may have drawbacks and side effects, leading to competition distortion.

As an example of competition distortion, let us consider an RTO licensed area. Unless it is reviewed, the licence granted to the RTO does not allow cellular-based mobile communication, but it allows WLL to connect customers in the licence area. The coverage expansion of the mobile telephone operators may lead to reach part or total of the RTO's licence area; but there is no possibility of asymmetric interconnection favouring the mobile telephone customers in the region as the mobile telephone pricing is a single one nationwide (mobility). An asymmetric interconnection favouring the RTO will thereby lead to discrimination between competitors in the same market area. Even in the case of an asymmetric interconnection between TKL and the RTO, and if the latter (RTO) uses CDMA 1X to build a fixed wireless access networks to connect the customers, here again, the competition will be further distorted because of the mobility enabled by this technology, (albeit it is limited), as resident users will rather favour the CDMA 1X network.

In addition, as CDMA 1X allows data transmission up to 153 Kbt/s, the competition in the Internet market will also be distorted and entry of competitive ISPs in the market of this region will be barred. Now that VoIP is allowed, competition in the

Internet service market and the mobile market will do better for the UA in the region.

b) An alternative to asymmetric interconnection

In the case of an unserved area, where a rural operator takes the risk to invest and serve the population, the following interim-measures are recommended. In granting the license, the CCK will ensure that a provision is made that asserts an annual accurate assessment of the access deficit incurred. The access deficit will be covered by the UAF. It however shall be made clear beforehand that the cover of the deficit will be under special pre-defined conditions including (among others, as the CCK may deem fit):

- assessment to be conducted by an independent evaluator commonly agreed upon
- access pricing for end-users not be plummeted by non cost-effective expenditures (over staffing, over pricing of equipment, useless equipment for the production of the services, and so on)
- procurement strategy that allows better acquisition prices (tender)
- end of the cover of access deficit once competition is developed in the market

6.2.6 Recommendations

- a) **The government should transform TKL into a privately owned company** through a process of selling shares to the public, employees, and local and international investors. This will enable TKL use some of the funds raised to build a modern and robust national backbone network infrastructure that will enable the implementation of e-government and other development applications.
- b) **The CCK should both conduct a large public consultation to review the interconnection guidelines and principles** and ensure that its application does not put in jeopardy the pursuit of the development of the national backbone infrastructure.

The review of the guidelines and principles shall pay due attention to the following issues:

- detailed interconnection obligations imposed to operators with SMP (ex-ante regulation)
- detailed content for RIOs and IAs
- dispute resolution mechanisms (rules and procedures): benchmarks with Botswana-BTA, UK-Ofcom, Canada-CRTC, EC-directives, and customised with local conditions and jurisdiction

- consumers' rights protection and social inclusion of persons with disabilities
 - detailed glossary: legal definition of terms used
 - edition of an interconnection booklet to serve as a guidebook and a reference paper for CCK-interconnection unit staff
- c) **The CCK should review the market structure, and to set commonly agreed upon criteria of market definition, the list of the relevant market segments, and criteria for dominant market assessment.** In particular, given the growing importance of the mobile telephone market, call termination in the mobile telephone market is likely to constitute an important market segment to observe with regard to the natural monopoly each mobile telephone operator has on this market.

Given the current development of the market and the foreseeable future that will register the entry of a SNO, local loop operators and a third mobile operator, the market structure will need a finer segmentation and a set of additional criteria to assess the power of different operators in different market segments, seeking the existence of the potentiality of market dominance abuse.

The list of the 19 market segments proposed in the EC-directive can serve as a basis for the exercise. The CCK will therefore have to define relevant markets by defining relevant product markets or segments and defining geographic markets in using the economic consideration of demand and supply substitutability. It will also have to use the relevant pre-defined criteria to carry out market assessment of each defined relevant market segment to identify operators or service providers with SMP to which special ex-ante obligation apply.

Answers to the following questions, among others, for example, will need to be provided by such a market study:

- Do Safaricom and Kencell enjoy collective dominance in the mobile telephone market, for example, in the call termination market under the CPP regime?
- How do we address issues of market share in the wholesale line rental market given that TKL has a 60% stake in Safaricom?
- What can be the competition implications of the regional presence in some relevant markets in Kenya of Vodafone and Celtel given that they have significant stake in Safaricom and Kencell, respectively?
- Should an obligation to provide national roaming facilities to the upcoming third mobile telephone operator should be imposed on both Kencell and Safaricom to ease its entry into the market and increase

competition benefiting at the onset large number of users and a greater national coverage?

- Shall the CCK oblige TKL to offer competitive Flat Rate Internet Access Call Origination (FRIACO) conditions to ISPs to foster competition in the Internet market? Competition between Jambonet and the ISPs in the wholesale line rental market for Internet, at least until the new licensees for international gateways can offer competitive products.

d) **The CCK should adopt and implement the FL-LRIC model.** The recent application of the FL-LRIC model in some countries has resulted in tariff reduction of some services, benefiting end-users and fostering competition.

The implementation of this recommendation is a huge and complex undertaking that would require contracting a well-experienced international consulting firm to help lead the process as happened for Uganda, Tanzania, Denmark, UK-Ofcom and other. This process will involve:

- developing a bottom-up model of TKL's public fixed telephony network for the calculation of long-run average incremental costs of an efficient public fixed telephony network, which reflects the actual architecture of TKL's network, but optimized according to the scorched-node approach (replacing the available cheaper technology that can deliver the same service)
- TKL developing a top-down model; TKL may use either the World Bank developed model or the ITU-COSITU model
- reconcile the bottom-up model with the top-down model to obtain an hybrid model
- using the finding of the hybrid model as the basis for the determination of the interconnection tariff; this last step may include benchmarks with best practices for consolidation purposes

It is suggested to create a LRIC-working group in charge of the process with the other objective to build capacity and knowledge transfer from the consulting firm.

Before the FL-LRIC model is developed and adopted, it is recommended that the CCK introduces a price cap to regulate TKL's tariff of its fixed network interconnection services (leased lined, transit, and so on). The price cap findings shall be benchmarked with best practices in the region or similar markets.

The implementation of the price cap as an interim model for tariff control may help address issues including the UA and the US obligations in general.

This will require the CCK to extend the application of the price cap to regulate the call termination market and the interconnection market for the mobile telephone operators, after determining that those operators have SMP in the relevant markets.

The CCK may define sub caps in order to protect low income users in the fixed line call origination. This can be achieved under a separate adjustment index to this low-income group in targeting, for example, the lower quartile bill that can be determined out of the customer basis of TKL. This approach may include wealthier people who do not make great use of their telephones, but it will help protect the majority of weak-revenue users.

- e) **The CCK should create an ICT research unit** that will collect, analyze, and publish regular well-documented information on the evolution of the sector. This will facilitate permanent dialogue with the public.

Lack of relevant and accurate data and information has always been mentioned as a problem for assessing the evolution of the sector and its impact on development. The new unit will continuously collect data using commonly agreed upon indicators that will help the CCK make necessary regulatory adjustments when and where relevant. This is critical for the implementation of the UA policy. This structure will be responsible for the dissemination of research and survey findings, reports on market assessments and general information to consumers. The unit needs to be relatively small because most of the research work can be contracted out to researchers.

In addition, the research unit will help in providing data and information for an effective socio-economic oriented interconnection regulation. In regularly reviewing the evolution of the market and the customer's usage and typology, the unit will also provide the CCK with baseline information for the determination of each operator's market position as well as the importance, the ranking/preference and the penetration of the various services.

- f) **The CCK should develop a consumer forum and build capacity in consumer organizations** to benefit from relevant comment, proposals, and active participation from end-users. This will include, among others, user's web page to be provided on the CCK's website and the edition of informative and training materials on user's rights, supplemented by workshops and seminars for the main consume organizations are suggested.
- g) **The CCK should develop a proposal to draft a convergence bill** that clearly sets the legislation and the regulatory framework. In particular, this will

require the review of the current market structure and categorization and the subsequent associated licensing regime. The end of the exclusivity period granted to TKL and the liberalization of the market is a good opportunity for conducting the required changes.

This recommendation is tightly linked with the advent of the liberalization of the market as the current market structure outlined in the Communication Act will become irrelevant in many of its aspects.

The full benefit of the convergence of technology requires the adoption of a new licensing regime and a technology-neutral approach in regulation (converged regulation). The significance of this trend is also strengthened by the recent development of broadband over power lines in addition to other emerging technology such as grid computing, utility computing, and IP-based communication that are descending into the business arena.

Lessons can be learned from the EC-directives as implemented by UK-Ofcom, Denmark or an emerging countries such Malaysia and South Africa.

The convergence bill will address the media ownership issues as P2P and the development of broadband connectivity are reshaping the media industry with the advent of Video on Demand (VoD) over high speed Internet such as ADSL, and leading to the obligation to review the content development, provision and distribution and the induced content-regulation issues including privacy, piracy, freedom of expression and IPR.

6.2.7 Implementation Plan

Table 6.2 below shows the implementation plan for the recommendations outlined in 6.2.6 above.

Table 6.2: The Implementation Plan for the Recommendations

	Recommendation / Immediate Objective	Activities	Expected Outcome	Other Parties Involved	Time Schedule	Relevant Experience to Consider	Estimated Cost
1	Review of the interconnection guidelines and principles (GI)	Revising and completing the current GI	Draft GI RIO	Operators and ISP Consumers	1.5 month	EC directives UK-Ofcom Malaysia Jordan Botswana	CCK—in kind (staff time)
2	Review of the market structure and segmentation assessment	Current market analysis Criteria for segmentation and so on Market power assessment	Set of the different market segments Set of criteria for market assessment SMP	NCA, operators and ISP consumers	Four months	UK-Ofcom Denmark-NITA Malaysia-MCMCA	US\$ 120 K
3	Introducing the FL-LRIC model for interconnection service charging	Establishment of a bottom-up working group ToRs for the recruitment of international consultant firm Public consultation	Cost-oriented interconnection pricing materials Capacity building for CCK	National Accounting Board Operators and ISP	Two years	UK-Ofcom Uganda Tanzania	US\$ 500 K
4	Monitoring the sector	Definition of set of indicators Survey instruments Communication and training	Regular publication of indicators and analysis of the sector	Institute of Development Studies, University of Nairobi	Three months	UK-Ofcom FCC Denmark-NITA	US\$ 100 and US\$ 80 per year
5	Capacity building for the consumer	Training materials Workshop and seminar	Trained consumers' organizations	Association of consumers Operators and ISPs	Two and half months	INTUG South Africa ACLU (USA) UK	US\$ 30 K

	Recommendation / Immediate Objective	Activities	Expected Outcome	Other Parties Involved	Time Schedule	Relevant Experience to Consider	Estimated Cost
6	Convergence of technologies /and the review of the Kenya Communications Act	Current market structure analysis Benchmarks Drafting convergence bill Public consultation	New market structure New licensing regime New regulatory framework – neutrality of technology	Operators and ISPs	Six months	UK-Ofcom Denmark Malaysia South Africa	US\$ 150 K

6.2.8 Framework for an Interconnection Booklet

Interconnection regulation is likely to constitute a significant part of CCK’s regulatory activities in the next three to five years with the new environment of the sector. Effective interconnection is fundamental to the success of the liberalization effort if competition has to be driver of the development and the subsequent expected increase of service choices with higher sustained quality while pulling down the prices for the end-users.

It is therefore important that the CCK’s unit in charge of interconnection gets the required knowledge and the necessary tools to discharge its functions and responsibility to interact efficiently with the sector’s key stakeholders.

The proposed booklet aims at providing the CCK interconnection unit with a continuously reviewed guide to serve as a reference document alongside other materials to be produced by the CCK.

Such a booklet shall address the general interconnection and access pricing issues pertaining to contestable markets in emerging economies, with a focus on the case of Kenya. In covering the scope as defined by the CCK the booklet will be developed in the following suggested framework.

a) Generalities

- a detailed glossary of terms commonly used in interconnection
- steps towards defining interconnection guidelines and principles in contestable markets
- review and approval mechanism of IAs submitted to the CCK
- process of market definition and segmentation in view of interconnection regulation
- strategic collaboration between the CCK and the national competition authority

- methods for reaching productive public consultation
- governance in interconnection regulation in a multi-operator environment

b) Technical issues

- development of competition and open network provision
- access to infrastructure: determination of point of interconnection and carrier pre-selection, number portability
- categorization of interconnection service provision
- interconnection regulation and us obligations
- rights of way
- co-collocation and facilities sharing regulation
- standardization and type approval

c) Economic and commercial issues

- the economics of interconnection
- access pricing and tariff control (call termination, call origination, tandem layer; flat rate internet access call origination local exchange call origination, local-tandem conveyance, national and international roaming, and so on)
- two-part charging
- interconnection cost models and their implementation strategy
- interconnection charges and consumer tariffs

d) Legal issues

- legal aspects of interconnection guidelines and principles
- benchmarking of various disputes resolution mechanism
- convergence of technologies and induced special legal and regulatory issues in interconnection (cooperation with third parties in content regulation: IPR, piracy, fraud, cyber crime, and ethics)
- user's rights protection
- other regulatory aspects of networked economies (ecommerce)
- the significance of the rule of law in interconnection regulation

e) Annex

- workshop and training materials
- list of references and relevant case studies

7. Strategic Plan

Vision

The national UA objectives and strategies are aligned to the following vision statement:

Quality communication services that are accessible, available, and affordable and that lead to enhanced and sustainable rural communications development

Mission

The national UA objectives and strategies are aligned to the following mission statement:

To provide an enabling environment and intervention for development and implementation of communication infrastructure and services in rural and under-served areas

Strategic Issues

A strategic issue is a fundamental challenge affecting an organization’s mandate, mission, product, service delivery, or clients. Strategic issues are derived from the strategic analysis of the environment and should be consistent with the mission and vision.

In this report, the scope of the strategic issues is limited to the scope of this project. For this reason, Table 7.1 below shows the issues that are beyond the scope of the UA project, gives the fundamental challenges and provides some recommendations.

Table 7.1: Strategic Issues beyond the Scope of the UA Project, Challenges and Recommendations

Strategic Issues	Fundamental Challenges	Recommendations
Power infrastructure	<ul style="list-style-type: none"> ▪ Limited penetration in the rural areas 	<ul style="list-style-type: none"> ▪ To exploit other alternative power sources where it is difficult or expensive to extend the national grid, for example, solar power in the rural areas ▪ To increase the penetration of power infrastructure in the rural areas with the appropriate policy interventions
Road infrastructure	<ul style="list-style-type: none"> ▪ Poor road infrastructure in the rural areas 	<ul style="list-style-type: none"> ▪ Plan and utilize the constituency development fund plus other roads money from the Kenya Roads Board

Strategic Issues	Fundamental Challenges	Recommendations
		from a central point in the Ministry of Roads and Public Works. A lot of this money is wasted and does not improve the condition of the infrastructure in rural Kenya
Income levels	<ul style="list-style-type: none"> ▪ Low disposable incomes in the rural areas, limiting the capacity of rural people to afford ICT services 	<ul style="list-style-type: none"> ▪ Improve rural incomes and in particular work on ensuring that the economic activities that people engage in have fair returns
Investment environment	<ul style="list-style-type: none"> ▪ Lack of incentives for investors (we need strategy to attract investment by operators in the rural areas) ▪ Lack of an explicit ICT strategic direction (national ICT policy and plan) ▪ Demonstration of the government's commitment to exploit ICT for development 	<ul style="list-style-type: none"> ▪ The government to show political will and commitment to ICT in order for other sectors to gain confidence in participating in ICT development and provision
Data for national ICT planning	<ul style="list-style-type: none"> ▪ Lack of adequate and up-to-date data for national ICT planning 	<ul style="list-style-type: none"> ▪ Transport and Communications section of the CBS to incorporate ICT in household surveys ▪ The CCK to create a research sub-department ▪ The CCK to commission ICT research studies on a regular basis and to collaborate with relevant research organizations
Security of communication facilities	<ul style="list-style-type: none"> ▪ Lack of adequate security of communication facilities 	<ul style="list-style-type: none"> ▪ Improve the security of communication and distribution facilities
Staff capacity	<ul style="list-style-type: none"> ▪ Supply of specialized staff is limited (reliance on expatriates) 	<ul style="list-style-type: none"> ▪ The Ministry of Education, Science and Technology to ensure that training in the tertiary sector is linked to manpower requirements in the industry
Illiteracy	<ul style="list-style-type: none"> ▪ Inability to access communication services because of illiteracy and language 	<ul style="list-style-type: none"> ▪ Ministry of Education, Science and Technology to implement adult literacy programmes
Interaction with consumers	<ul style="list-style-type: none"> ▪ Lack of a formal forum for the CCK to interact with consumers 	<ul style="list-style-type: none"> ▪ To establish consumer interaction mechanisms in the implementation of UA strategies and developing new initiatives. This interaction will be through a variety of media, including print, broadcasting, Internet (website), and so on.
The government's procedures	<ul style="list-style-type: none"> ▪ Bureaucracy in clearing goods at ports of entry ▪ Long procurement procedures, not in line with private business practice 	<ul style="list-style-type: none"> ▪ Implement the following ICT strategy in the ERS: Integrate IT network between the KPA, the KRA, the KRC and other port users in order to facilitate and shorten the period of processing

Strategic Issues	Fundamental Challenges	Recommendations
		<p>documents, from the current two to four days to one day</p> <ul style="list-style-type: none"> ▪ Revise procurement law to make procurement processes more efficient

Table 7.2 below shows the issues that are within the scope of the UA work that was carried out in this project. These issues will be the basis of objectives, strategies and action plan. The focus of the objectives, strategies and action plan is what the regulator, and by extension the government, can do to ensure UA to communication services.

Table 7.2: Strategic Issues within the Scope of the UA Project

Strategic Issues	Fundamental Challenges	Objectives
1. Availability of communications infrastructure	<ul style="list-style-type: none"> ▪ Limited availability or penetration of various communication services, especially in the rural areas ▪ Reduced fixed telephone connections despite increase in exchange capacity ▪ Closure of postal outlets ▪ Given the limited commercial viability of rural areas, lack of incentives for operators to invest in the rural areas 	<ul style="list-style-type: none"> ▪ To achieve effective coverage in rural areas
2. Accessibility of communications infrastructure	<ul style="list-style-type: none"> ▪ Lack of access to communication services, especially in the rural areas ▪ Reliability of infrastructure, for example, frequent breakdown of TKL's links and Jambonet ▪ Inadequate infrastructure, e.g. Jambonet bandwidth is limited ▪ High levels of illiteracy 	<ul style="list-style-type: none"> ▪ To realize effective public access to quality basic communication services in the rural areas
3. Affordability of services	<ul style="list-style-type: none"> ▪ High costs of providing the various communication services in the rural areas, for example, backhaul links ▪ High cost of frequency spectrum ▪ High cost of communication facilities 	<ul style="list-style-type: none"> ▪ To make communication services affordable to Kenyans, especially the low income groups
4. Local and relevant content	<ul style="list-style-type: none"> ▪ Limited supply of local content ▪ Limited choice of content ▪ Local content not available in local languages 	<ul style="list-style-type: none"> ▪ To facilitate the development of and access to a wide range of local and relevant content
5. ICT training	<ul style="list-style-type: none"> ▪ Lack of ICT support capacity in the rural areas ▪ Decision makers have limited awareness and knowledge of ICT ▪ Rural people are not aware of communication services available and their impacts 	<ul style="list-style-type: none"> ▪ To support the development of ICT human capacity required for rural development

Strategic Issues	Fundamental Challenges	Objectives
	<ul style="list-style-type: none"> ▪ Rural people do not have the basic skills and knowledge to exploit communication facilities 	
6. Frequency application processes	<ul style="list-style-type: none"> ▪ Processes of obtaining frequency spectrum are long ▪ Processes of type approval are long ▪ Complex licence forms ▪ Allocation of frequency spectrum is not transparent 	<ul style="list-style-type: none"> ▪ To ensure efficiency in frequency applications processing and equipment type approval
7. UA institutional framework	<ul style="list-style-type: none"> ▪ No institutional framework for UA 	<ul style="list-style-type: none"> ▪ To create and institutionalise an appropriate institutional framework for UA
8. Regulatory and licensing framework	<ul style="list-style-type: none"> ▪ Lack of regulatory provisions for UA ▪ Licensing framework does not favour rural operators 	<ul style="list-style-type: none"> ▪ To create a conducive regulatory and licensing framework for UA
9. UA financing	<ul style="list-style-type: none"> ▪ No funding for UA 	<ul style="list-style-type: none"> ▪ To establish sustainable funding for UA
10. Sustainability	<ul style="list-style-type: none"> ▪ Lack of sustainability of rural communications 	<ul style="list-style-type: none"> ▪ To ensure that rural communications is sustainable

Objectives, Targets and Strategies

This section presents an objective for each strategic issue identified above. It also gives targets to be achieved in the next five years (2005--2010) and the strategies to achieve both the objectives and the targets.

Availability

One of the problems we faced in developing strategies on availability is access to accurate information on the existing coverage of the various communication services, including power infrastructure. At the same time, most data was not readily available below the division level of the government's administrative structure. Nevertheless, we have used the data available (see Annex 1 on coverage) to identify the large gaps in the provision of communication services.

1. Objective

To achieve effective coverage in rural areas

2. Targets

- **Telecommunication and Internet services.** In order to increase the coverage of telephone services, existing and new telecommunications operators will need to deploy appropriate equipment, for example, base

stations or traditional telephone exchanges, to fill the supply gaps that were identified and prioritized in chapter 4 above. With PDNOs having the ability to provide voice services, we expect this category of operators to find rural business more attractive and therefore participate in increasing coverage.

The key target that needs to be realized is coverage of the population identified above by the existing major telecommunication operators or new entrants, with the possibility of subsidy using UA funds for areas that are uneconomical. In the under-served areas that are of the focus in the next five years, **the specific targets to be achieved are a rural teledensity of 5.8, one public telephone facility accessible to 800 inhabitants and one Internet point of presence per district.**

- **Postal/Courier services.** The study has shown a steady decline in postal outlets. The utilization of postal services is likely to decline with the availability of alternative means of communication. With the emergence of telecentres and other public/community centres offering a variety of communication services, the traditional concept of a postal outlet with restricted services will have to change. The PCK will have to enter into franchising/agency arrangements with operators of outlets offering other, especially telecommunication and Internet/data, services. This means abandoning the traditional postal outlet concept. The target is to integrate postal services into the telecentres offering other communication services.
- **Broadcasting services.** Radio broadcasting is almost reaching universal service. In addition, there is a high penetration of television broadcasting services. The targets to be realized should be much more towards local content than coverage. These are outlined in sub-section 7.4.4 below.

3. Strategies

- i) to encourage the exploitation of unused communications infrastructure of existing operators to provide access in rural areas
- ii) to encourage small operators obtain rural operator licenses
- iii) to give preference in allocation of frequencies that have the greatest reach to rural operators; this will enable operators reach longer distances and serve more customers per unit cost of equipment
- iv) to encourage national/regional operators to partner with rural/community based operators
- v) to zero-rate duties and taxes on equipment designated for provision of rural communication services and make licence fees tax deductible
- vi) to fund the access deficit from the UA fund for operators providing services in targeted areas

Accessibility

The baseline survey showed that rural people travelled long distances to get access to communication services. For example, on average households lived about 10 kilometres from the nearest postal outlet, almost 40% did not access to a post office box, over 99% did not have access to a fixed telephone at home, over 46% and did not have access to a mobile telephone, while on average people travelled 22 kilometres to the nearest Internet service provider. These access figures, which varied widely by region, gender, age, level of education, economic activity, and income, represent a high access gap which needs to be bridged.

1. Objective

To realize effective public access to quality basic communication services in the rural areas

2. Targets

Given the argument advanced earlier that access to communication services is increasing and will be from a single public or community centre, we propose that the targets to be achieved are:

- **Telephone services.** One public telephone facility in every sub-location; this will reduce the distances to the nearest public access point to within five kilometres.
- **Internet services.** The potential demand for Internet services is low compared to the demand of other services, about 20% (see table 7.5 below). We therefore propose one Internet point of presence (POP) per district with unserved divisions.
- **Integrated services.** One telecentre for every division, offering the whole cross-section of communication services, including postal services. The location of the telecentres will vary from place to place, depending on availability of physical infrastructure, including power and space as well as ease of access by the public.

3. Strategies

- i) To regularly review the concept of basic communication services. These services are defined initially to include fixed and mobile telephone, Internet, multimedia, letters, philatelic, private letter boxes, and television and radio broadcasting.
- ii) To establish and ensure adherence to quality of service standards for rural communications

- iii) To give incentives to entrepreneurs to establish and operate access points offering basic communication services in appropriate locations accessible to the public
- iv) To encourage the development and deployment of appropriate technologies, services and content that ensure non-discrimination, especially for disadvantaged groups (for example, non-text based computer interfaces for the illiterate)

Affordability

The baseline survey results gave the average expenditure of rural people on various communication services. For those who use selected services, the expenditure is summarized in Table 7.3 below:

Table 7.3: Average Household Monthly Expenditure on Various Communication Services

Service	Average monthly expenditure
Postal	55.00
Fixed telephone	171.00
Mobile telephone	607.00
Internet	362.00
E-mail	419.00
Total	1,614.00

Source: Baseline survey results

This expenditure is almost a fifth (19%) of the total rural monthly household income (see Table 2.2 in chapter 2) and a quarter (25%) of the total rural monthly household expenditure (see Table 2.3 in chapter 2) and above. This indeed is very high and represents a very high degree of “unaffordability” of communication services in the rural areas. We therefore need strategies to both reduce the cost of communication services in the rural areas and increase income levels³¹. We need a means to ensure that the benefits of any mechanism used to reduce service tariffs, for example, interconnection, are passed on to customers.

1. Objective

To make communication services affordable to Kenyans, especially low-income Kenyans

³¹ The latter is beyond the scope of this study.

2. Target

The target should be about **5% of the disposable income expended on communication services.**

3. Strategies

It is important to note that some of the strategies under availability will go towards reducing the cost of communication services. Other strategies related to address the challenges in affordability are:

- a) to support innovative projects that reduce communication tariffs in the rural areas
- b) to encourage operators to share infrastructure in the rural areas
- c) to reduce the licence and frequency fees for rural operators
- d) to ensure there is full competition in all the communications sector markets
- e) to review interconnection guidelines and principles
- f) to introduce a price cap to regulate markets where operators have SMP
- g) to introduce FL-LRIC model

Local and Relevant Content

If the communication infrastructure to be developed using the strategies in 7.4.1 to 7.4.3 is to be beneficial for rural development, it is important that there is local content that is relevant to the development needs faced by rural people. This is especially in Internet and data services as well as in radio and television broadcasting. In addition, this content needs to be in languages that are widely spoken by the rural population.

1. Objective

To facilitate the development of and access to a wide range of local and relevant content

2. Target

The target is **60%—80% local content available and hosted within Kenya in Internet and data services** and **30%—50% of local content in radio and television broadcasting.**

3. Strategies

- i) To support projects and initiatives aimed at developing, translating and adapting useful and socially meaningful content, for example, weather

forecasts, product prices, financial advisory services, development radio and television programmes, and academic programmes

- ii) To promote variety in local content production in order to give choice to consumers
- iii) To promote the use of Kiswahili and other local languages in local content preparation and presentation
- iv) To support cost-effective access to local content by rural people, for example, local hosting, and voice-activated access to useful data

ICT Training

1. Objective

To support the development of ICT human capacity required for rural development

2. Target

We believe that the developmental impacts of communication services will not be realized if there is limited capacity to develop, exploit and support ICT facilities. The target should be to have **at least one ICT training institution in every district.**

3. Strategies

- i) to create awareness of the communication services available and the impacts they have on rural development
- ii) to support the establishment of local ICT training centres in appropriate “vanguard” institutions in the rural areas in each of the targeted districts
- iii) to support relevant ICT training for rural-based people (whether by local training providers, distance learning by large and established institutions, or both)
- iv) to support the development of high-calibre manpower required in the ICT industry

Frequency Application Processes

The processing of frequency spectrum applications, plus the associated equipment type approval, takes too long and is not transparent, as outlined under strategic issues above.

1. Objective

To ensure efficiency in frequency applications processing and equipment type approval

2. Target

The target is to reduce the current average of four to twelve weeks to **four weeks turnaround for processing of frequency applications**. This may require parallel processing of frequency applications and equipment type approval.

3. Strategies

- i) to re-engineer the processes of frequency application, especially for rural operators
- ii) to computerize the frequency application processes, including electronic completion and submission of application forms
- iii) to make public the status of the Kenya table of frequency allocations, subject to any security restrictions
- iv) to make current and potential operators aware of the frequency spectrum application and type approval processes

UA Institutional Framework

The study recommends that a unit within the CCK be created and tasked with responsibilities over UA. We shall refer to this unit as the UA/CDU. This unit shall have a separate board with representation from key stakeholders. Details of the governance and institutional structure of this unit are given in the chapter 9 on operating procedures in this report.

1. Objective

To create and institutionalize an appropriate framework for UA

2. Target

The target is to have **an institutionalized and effective institutional and governance structure for UA**.

3. Strategy

- i) To establish new unit in CCK to be in charge of UA

Regulatory and Licensing Framework

The KCA 1998 does not have explicit provisions for UA. It also does not provide for any special conditions for the licensing of rural operators. The target is to introduce explicit provisions for UA in KCA 1998 to provide for:

- The setting up a UA/ CDF to support UA to communication services
- Licensees to make contributions to the Fund
- The setting up the institutional framework to administer the UA/ CDF

It is important that these amendments are couched in the framework of a convergence bill, which the Ministry of Information and Communications should be considering.

In addition, there is need to review the current Kenya Communications Regulations to provide for operating procedures for the UA/ CDF and to review the licensing framework to give special considerations in the licensing of rural operators.

There is need to review the policy framework with respect to the exclusivity given to both TKL and the PCK. TKL's monopoly came to an end in June 2004 after the end of the exclusivity period while the PCK's monopoly was not time-bound. Given that courier operators will be able to bid for provision of postal services under the CDF proposed in this report, it is necessary to remove the requirement for these operators to charge five times what the public postal licensee charges, especially for courier operators willing to provide services in the rural areas. It is perhaps prudent to still designate the PCK as the public licensee for the provision of private letter boxes/bags and the issuance of postage stamps but for a limited time (for example, five years). Further, there is need to review the licences of both TKL and PCK with respect to US rollout targets and bring them in line with the proposals of this report.

1. Objective

To create a conducive regulatory and licensing framework for UA

2. Target

The target is to have **revised or new Communications Act taking into account national development priorities and convergence of communications technologies.**

3. Strategies

- i) to review the KCA 1998 and the Kenya Communications Regulations 2001 as a short-term measure to give UA legislative authority and ensure the smooth operation of the proposed rural CDF
- ii) to create a one-stop and efficient licensing framework for rural operators

- iii) to review the policy framework for telecommunications and postal services and review operators' licences with respect to the universal service rollout targets
- iv) to draft a new Communications Act that integrates all communications services
- v) to review the Postal Corporation Act

UA Financing

This study established that Kenya does not have a mechanism to fund UA. The two mechanisms that are recommended by the study are incentives and a central fund. The various incentives were outlined under the objectives on availability and affordability above.

The funding required is that which meets the costs of serving the areas that are not covered. We therefore first estimate these costs before examining the financing strategy.

a) Costs of providing services in uncovered areas

The baseline survey showed that radio and mobile telephone services have the widest coverage, 82% and 85% of the sample, respectively. If we exclude radio services as we argued when analyzing supply gaps in chapter 4, we can say that 82% people have access to at least one service. If we assume that 82% of the total divisions now have or are likely to have access, then 18% of the 480 divisions (see Table 4.3 in chapter 4) do not and are unlikely to have access in the near future. This translates to 86.4 divisions that may difficult to provide services. We can round this off to 90 divisions to be supported in the next five to ten years. The difference from 139 may be accounted for by the inaccuracy in the coverage data. In addition, some of the areas are likely to be covered by the operators because the areas are not challenging. These are areas, for example, with population densities of least 300 people per square kilometre and relatively low levels of poverty.

The cost of providing the various services in the 90 challenging divisions according to the strategies in this chapter is outlined below:

- **Support operators to provide telephone infrastructure**

The 90 divisions have a population of 2.2 million, out of which 1.7 million is rural (80% of the total based on that 80% of the population lives in the rural areas). Table 7.4 shows the potential demand for various services from the baseline survey.

Table 7.4: Potential Demand for Communication Services

Service	Method Used	% of Sample
Fixed telephone	Those who would like to have access but were not connected	69.4
Mobile telephone	Those with mobiles and those that had made mobile calls but they lacked the phones	43.9
Postal	Those who had received mails within a period of up to the past six months	80.2
Internet	Those who knew about Internet services and have used these services at one point	21.2

Source: Baseline survey

According to the 1999 population and housing census, 47% of the population is 14 years of age and below. This group is unlikely to have viable sources of income and to have little demand for communication services. This translates to 918,966 potential customers (53% of rural population). If we take the potential demand for fixed telephone services from Table 7.4 to be the true reflection of demand for telecommunication services, we get a demand of 643,276 (70% of the potential customers). We make the following assumptions:

- i. People will be reached using the dominant telephone network, which from chapter 3 is the mobile telephone network. This represents the cost ceiling because alternative technologies would generally tend to be less expensive.
- ii. There is a significant private demand in the 90 divisions. The nation-wide baseline survey showed that 25% of the sampled population had individual ownership of a mobile telephone. The same survey however showed very low monthly incomes. If we consider affordability of a telephone to be restricted to people earning over KShs. 6,000 per month, the baseline survey showed that in most provinces, except for North Eastern and Eastern provinces, there is at least 9%-18% of the population in this category. If we therefore assume an average private demand of 15%, this gives a total of 96,491 customers or lines required³². The rest of the population will be served using public access facilities.
- iii. A target of 800 inhabitants having access to a public access telephone facility. This translates to 30 public access points per division or one access point per sub-location. We assume that each division has an average of 30 sub-locations. This will enable most people to access public telephone facilities within typical walking distances of five kilometres. The total lines to be rolled out are therefore about 100,000. This translates to a teledensity of 5.8 lines per 100 people.
- iv. The cost per line for the two mobile operators is currently below US\$ 200. However, given the low population densities in the underserved areas, the

³² The presence of private demand in most areas is an incentive for would-be operators. The proposed fund will support the rollout to meet private and public demand. This will be an additional incentive to the operators. It also means that the time required for these areas to become commercially viable is that much shorter.

cost per line is likely to be higher. A study on provision of mobile telephone services to rural and low income areas in Tanzania (Engvall, A. and Hesselmark O., 2004) showed per line costs of US\$ 250-300. We have therefore taken a relatively safe cost per line of US\$ 250.

The total cost of investment over a five-year period is \$25 million. Assuming that a 30% subsidy is adequate, this gives a subsidy on investment of \$7.5 million. **The total subsidy required per year is \$1.5 million.**

It can be noted that the average population density of the 90 underserved divisions is about 30 inhabitants per square kilometre. If we assume that a base station covers at least 20 kilometres radius, Engvall and Hesselmark (Engvall, A. and Hesselmark O., 2004) show that 1,200 customers can be covered by one base station at 6% penetration (see assumption iii. above). For 100,000 customers over the five-year period as argued above, this translates to a requirement of 83.3 base stations, or an average of one base station per division. These facilities or their equivalent can be developed by licensed national or regional operators or by local loop operators or by other rural operators. Given that some of the divisions in the less populated parts of Kenya are vast, it might be necessary to use other mechanisms of extending the signal coverage in order to ensure more reasonable coverage per base station.

- **Support operators to develop Internet POP infrastructure**

TKL has had the monopoly of providing Internet POPs through upgrades of its existing digital telephone exchanges. We have estimated the cost of developing Internet POPs using the dominant technology used by TKL. This represents the cost ceiling because alternative technologies would generally tend to be less expensive.

Data obtained from TKL shows that establishing a Jambonet point of presence in its telephone exchanges costs an average of US\$60,000³³. We assume that the UA programme will establish a POP in each of the 49 districts that contained divisions that were unserved or were very poorly served (see chapter 4 or Annex 1). Operators will be obligated to provide at least one public telecentre for each POP developed. This telecentre, with at least three personal computers and two public telephones or equivalent devices, will provide telephone, Internet, data, broadcasting and content access services. The total investment required is \$2.94 million. Assuming that a 30% subsidy is adequate, this gives a subsidy on investment of \$882,000. **The total subsidy required per year is \$176,400.**

³³ It is assumed other operators, using different technologies, can establish Internet POPs much more cheaply.

- **Support local entrepreneurs to establish public access centres**

We target to support a public access centre (PAC) per division which will be in addition to the 30 public access telephone facilities provided by the operator in every division. The PACs will range from a simple community telephone, to telephone bureau, to cyber café and to a fully fledged telecentre offering a wide variety of basic communication services, including telecommunication, Internet, data, broadcasting, content access and postal³⁴ services.

Although cyber cafes have tended to emerge naturally after an Internet POP has been established, people in the underserved areas may not be capable of establishing these facilities given the high levels of poverty in these areas. Therefore the UA/Communications Development (UA/CD) programme will support the development of cyber cafes. For similar reasons, the UA/CD programme will also support single public payphones, although the cost of these has rapidly been coming down as argued in chapter 4.

We assume that there will be more of the high end public access facilities being established (cyber cafes and telecentres). We take the average cost of a public access centre to be about \$10,000. The high-end public facility, a telecentre, will have access to broadband services. We recommend that the support to establish PACs be in the form of loans to local entrepreneurs. We also recommend that CCK outsources the administration of these loans to a micro-finance institution (MFI). In this way, CCK will be creating a sustainable fund that can be used to meet the changing UA objectives. If we further assume that the MFI will charge 15% of the loan amounts for administration services, the total cost per PAC is \$11,500.

The total investment required is \$1.035 million. We assume a 100% subsidy, given the low levels of income in the underserved areas. The **amount required per year is \$207,000**. As recommended above, this amount will be treated as a loan to local entrepreneurs to create a revolving fund for lending to other entrepreneurs.

- **Support the development of local content**

It is widely recognized that infrastructure development is useless without content that is relevant and meaningful to the users' day-to-day life. On average, the current levels of local and relevant content are very low. We propose to achieve targets of 30%, 50% and 60-80% local content in television broadcasting, radio

³⁴ It is assumed that postal can be provided together with other services. In the case of postal service provision, the PCK will have to enter into agreements on revenue sharing with a local entrepreneur, given the exclusivity of some of its services. The lessons learned with this arrangement will pave way to the lifting of the exclusivity given to the PCK on some of the services and thus introduce competition in this sub-sector.

broadcasting and Internet and data services over the next five years through a phased series of interventions. We propose the UA/CDF provides an annual **support of \$300,000** for content development in appropriate contract packages. These contracts will go into supporting the e-government strategies. This is particularly in developing ministry and government department portals and making the portal information easily, widely and equitably available to citizens. The contracts will also support the development of appropriate tools for content development and dissemination, e.g. text-to-speech tools for Kiswahili and other local languages, and localization of content using ICT tools. The provider of the content will also be expected to involve the key stakeholders and carry out appropriate training in the relevant ministries or departments, the public access centre operators and the local community.

- **Support the establishment of ICT training facilities**

We propose to support the establishment of ICT training facility in “vanguard” institutions in the underserved areas. This is preferably in a school, college, or an institution of higher learning. The institution will provide training for all the projects supported in the district, including training the entrepreneurs operating public access centres to provide services to the community. We make the following assumptions:

- A training facility of 15-20 networked personal computers, Internet connectivity, necessary software and other necessary training facilities, will cost an estimated \$40,000 per centre. With this amount, it is possible to establish a VSAT-based Internet access facility where Internet is not available in a centre.
- The amount above includes the cost of administration of a loan (15%). As with the establishment of public access centres, we recommend that the amounts to the “vanguard” institutions be considered as loans, administered by a separate micro-finance institution.
- The UA programme will support the cost of maintenance for the first two years. Assuming maintenance costs at 15% of the investment, the cost over the two years is \$12,000 (\$6,000 per year).
- The UA programme will support the recurrent cost of Internet for two years. Assuming 128 Kbps dedicated link at \$1,000 per month, the total cost over the two-year period is \$24,000.
- Three ICT training centres to be established in each of the six underserved provinces.

The cost of investment and support over the two-year period for each centre is \$76,000. The total investment for the 18 centres is \$1.368 million over a five-year period. Assuming a 100% subsidy, **the amount required per year is \$273,600**. It is

recommended that this amount be treated as a loan and dealt with in the same way as that for entrepreneurs establishing public access centres.

The summary of costs is shown in Table 7.5 below.

Table 7.5: Summary of Costs

No	Project Area Supported	Units	Quantity	Unit Cost (US\$)	Subsidy	Total Cost (US\$)	Cost per Year (US\$)
1	Telephone infrastructure	Lines	100,000	250.00	30%	7,500,000.00	1,500,000.00
2	Internet POPs	Numbers	49.00	60,000.00	30%	882,000.00	176,400.00
3	Public access centres	Numbers	90.00	11,500.00	100%	1,035,000.00	207,000.00
4	Local content	Contracts	50.00	30,000.00	100%	1,500,000.00	300,000.00
5	ICT training	Centres	18.00	76,000.00	100%	1,368,000.00	273,600.00
TOTAL						12,285,000.00	2,457,000.00

Thus the total amount of support required per year is **\$2,457,000**.

Although we have assumed a 30% subsidy for infrastructure development by operators, we envision that the extent of subsidy will vary depending on the socio-economic development characteristics of particular targeted areas or the access deficit incurred. In addition, there will be other incentives that will attract operators to rural areas. These additional incentives will either go towards reducing the total investment an operator requires or towards reducing the amount of subsidy. These include:

- i. **Frequency spectrum.** One of the strategies recommended here is to reduce the frequency spectrum fee for rural areas. We believe this should be for all rural areas rather than the designated rural areas. An additional incentive is that frequency spectrum allocation would be more efficient and that the executive head of UA/Communications Development (UA/CD) Unit (see chapter 9), would act as a one-stop shop for spectrum allocation.
- ii. **Licence.** We have recommended reduction of licence fees for rural areas. Again we believe this should be for all rural areas rather than for the designated rural areas. An additional incentive is to make provisions in the licensees' licences that allow them to move beyond the designated rural areas and/or provide additional services once the UA obligations are met. The provision of additional services, as well as provision of services beyond the targeted areas, is not subject to subsidy, however.
- iii. **Import Duties.** We have recommended zero-rating of import duties for the various types of equipment to be deployed in rural areas. Unlike the other

two incentives outlined above, we believe that this particular incentive should only apply to designated rural areas as per the UA/CD programme. The Ministry of Finance is more likely to accept this limited exemption rather than the more blanket exemption which may be abused, denying the government much needed revenue. With this incentive alone, the total subsidy given to the operators is likely to be almost 50%.

With the above incentives, operators should find provision of communication services in the designated areas, and in rural areas in general, more commercially viable. This increased viability should enable operators to charge similar tariffs as, if not lower tariffs than, in urban areas³⁵.

b) Financing the uncovered areas

The study recommends a central fund with diversified sources of income, including the government, development partners, well-wishers and levies levied on operators and service providers. The key sources of funds are as follows:

- i. **Telecommunications operators.** We have proposed that telecommunications operators pay an additional 0.5% of gross revenue, making the total levies 1% of gross revenue. In Uganda, Peru, and Columbia, the total levies are 1%, 1% and 2% of gross revenue respectively. The levies in Kenya are therefore in line with levies in other countries.
- ii. **Postal and courier operators.** We have proposed that postal and courier operators pay an additional 20% of their respective current annual fees. In most countries, including Uganda, these operators pay 1% of their gross revenue, which is much higher than the current annual fees in Kenya.
- iii. **The CCK.** We have proposed that the CCK gives seed funds of KShs. 20m to start off the fund each year in 2004/2005. This will be used to start off a pilot project. In addition, the CCK will make a 1% contribution of its gross revenue from 2005/2006.

Table 7.6 below shows the contributions from various sources.

Table 7.6: Estimated Revenue to Fund UA (KShs. 000,000)

Gross Revenue of Telecom Operators	Safaricom	18,000.00	18,900.00	19,845.00	20,837.25	21,879.11
	Kencell	7,000.00	7,350.00	7,717.50	8,103.38	8,508.54
	TKL	16,000.00	16,800.00	17,640.00	18,522.00	19,448.10
	Others	1,000.00	2,000.00	3,000.00	4,000.00	5,000.00
CCK Gross Revenue		1,700.00	1,785.00	1,874.25	1,967.96	2,066.36

³⁵ Operators in practice tend to charge a higher tariff in rural areas in order to address the perceived economic "unviability" of these areas, this goes against UA principles.

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Source	Year	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
CCK (initial seed funding and regular contributions)		20.00	17.00	17.85	18.74	19.68	20.66
Levies on telecom operators							
% of gross revenue			0.50%	0.50%	0.50%	0.50%	0.50%
Safaricom			90.00	94.50	99.23	104.19	109.40
Kencell			35.00	36.75	38.59	40.52	42.54
TKL			80.00	84.00	88.20	92.61	97.24
Others (existing and new operators)			5.00	10.00	15.00	20.00	25.00
Postal and courier operators							
Additional % of annual fees			20%	20%	20%	20%	20%
	Annual fees						
PCK	4.000		0.800	0.840	0.882	0.926	0.972
International in-bound operators	0.640		0.128	0.134	0.141	0.148	0.156
International operators	8.800		1.760	1.848	1.940	2.037	2.139
Regional operators	0.800		0.160	0.168	0.176	0.185	0.194
Intra-country operators	3.072		0.614	0.645	0.677	0.711	0.747
Intracity operators	1.056		0.211	0.222	0.233	0.244	0.257
Document exchange operators	0.024		0.005	0.005	0.005	0.006	0.006
Total (KShs.)		20.000	230.883	247.167	264.015	281.456	299.519
Total (US\$ @ 81)		0.247	2.850	3.051	3.259	3.475	3.698

The assumptions in arriving at the above estimates are:

- i. The CCK will give seed funds of KShs. 20m to start off the fund in 2004/2005 and makes a 1% contribution of its gross revenue from 2005/2006.
- ii. Telecommunications operators start making contributions to UA in 2005/2006 at an extra 0.5% of gross revenue.
- iii. Existing and new telecommunications operators ("others") are assumed to have an initial turnover of KShs. 1 billion; the business volume increases by KShs. 1 billion every year.
- iv. Postal and courier operators make an additional 20% contribution of existing annual fees. However, there is an outcry by the courier operators that the current annual fees are high. It might therefore be necessary to review these fees to reflect their business operations.

- v. All contributions should go up by a conservative 5% every year.

It is to be noted that contributions of other categories of operators and operators, notably ISPs and PDNOs, have not directly been factored in. Their contributions has been lumped up together under the “others” category.

It is also important to note that the money from the CCK in 2004/2005 will go towards carrying out a pilot project, which is outlined in the recommendations in chapter 10. The pilot projects will enable CCK to generate interest in the UA/CD programme, refine its knowledge of the rural markets and develop its methodology for the main programme. In particular, the evaluation of the pilot projects will provide insights into replicability and scalability as well as sustainability. Other advantages are that the benefits of integrating ICT in rural development will be visibly demonstrated and that the lessons of the pilot projects can be used as a basis to source funding from development partners in various development sectors, for example, ITU, World Bank, UNESCO, and WHO.

It should be noted that the above funding is the minimum required. With aggressive fund-raising initiatives by the proposed UA/CD Board, it is possible for both the government and development partners to make contributions. This would then go towards further either reducing the levies on the operators and service providers or increasing the number of projects. At the same time, the amount of revenue is much higher than the cost of supporting the provision of services to targeted areas. This means that the UA/CD programme can be expanded to cover more areas than planned for in this report.

Operators may be offered the option to realize part of the UA/CD programme and have the relevant cost incurred deducted from their levy-contribution. However, the decision to invest in an area shall be consistent with the general UA/CD programme adopted and shall be agreed upon by the CCK beforehand. The amount to be deducted shall be based on an independent assessment of the investment made.

1. Objective

To establish a sustainable funding for UA

2. Targets

The target is to have **adequate funds to meet the financial requirements of the UA strategies now and in the future.**

3. Strategies

- i) to establish a CDF with diversified sources of income
- ii) to change licences of the operators to reflect their contributions to CDF
- iii) to solicit funds from other sources
- iv) to ensure fair access to and effective utilization of the CDF and incentives to leverage investment in rural communication development

Sustainability

1. Objective

To ensure that rural communications is sustainable

2. Target

The target is to have **rural communications become sustainable**.

3. Strategies

- i) to develop a consumer forum and build capacity in consumer organizations
- ii) to support initiatives that promote rural communications
- iii) to create an ICT research unit in the CCK (data collection, analysis and dissemination on a continuous basis)
- iv) to annually review the UA policy framework, ensuring that this framework is linked both to rural development goals and with the full participation of all key stakeholders

8. Implementation Plan

Overall Implementation Plan

The implementation plan for all the strategies is shown in the following table:

Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
1. To achieve effective coverage in rural areas	Rural teledensity of 5.8; One public access telephone facility for every 800 inhabitants; 1 Internet POP per district	a) To encourage the exploitation of unused communications infrastructure of existing operators to provide access in rural areas	Framework for exploiting unused capacity, especially in rural areas	CCK, Operators	Jan 2005 & continuous
		b) To encourage small operators to obtain rural operator licenses	Innovative rural operator licenses	CCK	Mar 2005 & continuous
		c) To give preference in allocation of frequencies that has the greatest reach to rural operators	Guidelines for frequency allocation	CCK	Immediate & review annually
		d) To encourage national/regional operators to partner with rural/community based operators and entrepreneurs	Interconnection guidelines	CCK, Operators	Mar 2005 & continuous
		e) To zero-rate duties and taxes on equipment designated for provision of rural communication services and make license fees tax deductible	Paper offering arguments and benefits for consideration by MoF	CCK, MoIC, MoF	Mar 2005 & continuous
		f) To fund the access deficit from the UA fund for operators providing services in targeted areas	Operations manual for the UA fund	CCK, MoIC	Mar 2005

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Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
2. To realize effective public access to quality basic communication services in the rural areas	1 public telephone facility per sub-location; Internet POP per district; 1 public access centre per division; Integrate postal services in public access centres	a) To regularly review the concept of basic communication services	Revised UA policy	NCS, CCK, Stakeholders	2005/2006 & annually
		b) To establish and ensure adherence to quality of service standards for rural communications	Quality of service standards and enforcement mechanisms	Operators, Customers, CCK	Immediate & continuous
		c) To incentivise entrepreneurs to establish and operate access points offering basic communication services in appropriate locations accessible to the public	Procedures for incentive provision	CCK	Mar 2005 & continuous
		d) To encourage the development and deployment of appropriate technologies, services and content that ensure non-discrimination, especially for disadvantaged groups	Review license conditions of licensees	CCK	Jun 2005 & review annually
3. To make communication services affordable to Kenyans, especially the low income groups	Reduce the expenditure on communication services to 5% of the disposable income of the rural people	a) To support innovative projects that reduce communication tariffs in the rural areas	Guidelines on how this will be supported	Operators, Service Providers, CCK	June 2005 & continuous
		b) To encourage operators to share infrastructure in the rural areas	Guidelines for sharing infrastructure	CCK	Mar 2005 & continuous
		c) To reduce the license and frequency fees for rural operators	New license and frequency fees structure for rural operators	CCK	Sep 2005 & continuous
		d) To ensure there is full competition in all the communications sector markets	Revised market structure & segmentation; Criteria for SMP assessment; Operators with SMP	CCK, Operators, Consumers	June 2005 & reviewed annually

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Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
		e) To review interconnection guidelines and principles	Revised interconnection guidelines & principles; Reference interconnection offer	CCK, Operators, Consumers	June 2005 & reviewed annually
		f) To introduce price cap to regulate markets where operators have SMP	Mechanism to ensure benefits of price reductions are passed on to consumers	CCK, Operators, Consumers	Mar 2005 & reviewed annually
		g) To introduce forward looking - looking long run incremental cost (FL-LRIC) interconnection model	Cost oriented interconnection model; CCK's staff trained on interconnection	CCK, Consulting firm	2005 - 2007
4. To facilitate the development of and access to a wide range of local and relevant content	30-50% local content for TV and radio broadcasting and 60-80% local content for Internet and data services	a) To support projects and initiatives aimed at developing, translating and adapting useful and socially meaningful content	Official policy framework	NCS, CCK, Stakeholders	Jan 2005 & continuous
		b) To promote variety in local content production in order to give choice to consumers	Official policy framework	NCS, CCK, Stakeholders	Jan 2005 & continuous
		c) To promote the use of Kiswahili and other local languages in local content preparation and presentation	Official policy framework	NCS, CCK, Stakeholders	Jan 2005 & continuous
		d) To support cost-effective access to local content by rural people	Guidelines on how this will be supported	Operators, Service Providers, CCK	Jan 2005 & continuous
5. To support the development of ICT human capacity required for rural	At least one "vanguard" institution or training provider offering ICT	a) To create awareness of the communication services available and the impacts they have on rural development	Workshops materials and CCK website containing necessary content	CCK	Mar 2005 & continuous

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Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
development	training in every district	b) To support the establishment of local ICT training centres in appropriate "vanguard" institutions in the rural areas in each of the targeted districts	Guidelines on how this will be supported	CCK, MoIC, MoEST	Mar 2005 & continuous
		c) To support relevant ICT training for rural-based people (whether by local training providers, distance learning by large and established institutions or both)	Guidelines on how this will be supported	CCK, MoIC, MoEST	Mar 2005 & continuous
		d) To support the development of high-calibre manpower required in the ICT industry	Collaboration arrangements with higher education institutions & private industry	CCK, HE institutions, industry	Mar 2005 & continuous
6. To ensure efficiency in frequency applications processing and type approval	4 weeks turnaround time for processing of frequency spectrum applications	a) To re-engineer the processes of frequency application, especially for rural operators	Re-engineered frequency spectrum application processes	CCK	Jan 2005
		b) To computerize the frequency application processes, including electronic completion and submission of application forms	Commissioned computer-based and Internet enabled system for frequency applications processing	CCK	Jun 2005
		c) To make public the status of the Kenya table of frequency allocations, subject to any security restrictions	Operational and secure web pages for Kenya table of frequency allocations	CCK	Mar 2005
		d) To make current and potential operators aware of the frequency spectrum application and type approval processes	Operational web pages of the frequency spectrum application and type approval processes	CCK	Mar 2005

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Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
7. To create and maintain an appropriate institutional framework for UA	Institutionalized and effective institutional and governance structure for UA	a) To establish new unit in CCK to be in charge of universal access	Operational institutional structure in charge of universal access	CCK	Mar 2005 & reviewed with implementation of UA projects
8. To create a conducive regulatory, licensing and policy framework for universal access	Revised or new Communications Act taking into account national development priorities & convergence of technologies	a) To review the current Kenya Communications Act 1998 and the Kenya Communications Regulations 2001 as a short-term measure to give universal access legislative authority and ensure smooth operation of the proposed UAI Communications Development Fund	Revised Kenya Communications Act 1998 and Kenya Communications Regulations 2001 to provide for UA operations	CCK, MoIC	Mar 2005
		b) To create a one-stop and efficient licensing framework for rural operators	Revised licensing framework	CCK	Mar 2005
		c) To review the policy framework for telecommunications and postal services and review operators' licenses with respect to the universal service roll-out targets	Policy framework in line with UA strategies and operator licenses in line with changed communications sector realities	NCS, CCK	Mar 2005
		d) To draft a new Communications Act that integrates all communications services	New market structure; New licensing framework; New regulatory framework	CCK, MoIC, Stakeholders, Researchers	2005/2006
		e) To review the Postal Corporation Act	Revised Postal Corporation Act	CCK, MoIC	Mar 2005

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Objective	Target in 5 Years	Strategy	Intermediate Output	Responsibility	Timeframe
9. To establish a sustainable funding for UA	Adequate funds to meet the financial requirements of the UA strategies	a) To establish a UA Communications Development Fund (UA/CDF) with diversified sources of income	Provisions in Communications Act and Regulations for UA funding	CCK, MoIC	Mar 2005
		b) To change the licenses of the operators to reflect their contributions to CDF	Revised licenses for operators	CCK	Mar 2005
		c) To solicit funds from other sources	Project proposals as basis for soliciting funding	CCK	Mar 2005 & continuous
		d) To ensure fair access to and effective utilization of the fund and incentives to leverage investment in rural communication development	Guidelines and enforcement mechanisms for accessing incentives and disbursing UA support funds	CCK	Mar 2005 & reviewed with implementation of UA projects
10. To ensure that rural communications is sustainable	Rural communications is sustainable	a) To develop a consumer forum and build capacity in consumer organizations	High level of interaction with consumer organizations; Trained consumer organizations	CCK, Consumer organizations, Operators	Mar 2005
		b) To support initiatives that promote rural communications	Working rural communications development initiatives	CCK	2005/2006 & continuous
		c) To create an ICT research unit in CCK	Structure and functions of the ICT research unit	CCK	June 2005
		d) To annually review the UA policy framework, ensuring linkages to rural development goals and priorities and full participation of all key stakeholders	Reviewed UA policy framework	NCS, CCK, Stakeholders	2005/2006 and reviewed annually

UA/CD Programme Implementation Plan

The implementation plan for the UA Communications Development (UA/CD) programme described in chapters 7 and 9, together with the pilot projects outlined in chapter 10, is shown in the table below. The table shows the quantity of the programme item to be rolled out in each of the five years.

Programme Item	Units	Qty in programme	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010
Pilot projects implementation, monitoring & evaluation	Projects	4	4	0	0	0	0
Telephone infrastructure	Lines	100,000	0	15,000	25,000	30,000	30,000
Internet POPs	Numbers	49	2	10	11	13	13
Public access centres	Numbers	90	2	20	20	24	24
Local content	Contracts	50	2	10	12	13	13
ICT training	Centres	18	0	3	4	5	6

9. Manual of Operating Procedures

9.1 Introduction

The CCK regulates the telecommunications and postal services sub-sectors. It is proposed that broadcasting is also brought under the regulation of the CCK.

The KCA 1998 does not give explicit provisions for the CCK to ensure universality of access to communication services. This report recommends that the act and the Kenya Communications Regulations 2001 are amended as a short-term measure to give UA legislative authority and to ensure the smooth operation of the proposed rural UA Communications Development Fund (UA/CDF). In the long term the report recommends the drafting of a new Communications Act that integrates all communications services, taking into account the national development priorities and a convergence of technologies.

The UA/CDF will provide partial funding for the extensions of communication services in designated marginal areas. This manual of operating procedures provides specific guidelines and operating principles under which the UA/CDF will take place. Specifically, it describes how:

- The areas and projects to be supported will be identified, prioritized and selected.
- The mechanism of achieving UA will be funded.
- Subsidies from the UA/CDF will be allocated to projects.
- The UA/CDF will be governed, managed and administered.
- Contracts will be processed and recipients selected.
- Funds will be disbursed.
- Performance will be monitored and evaluated.

9.2 Overview of the Strategic Plan for Rural Communications

9.2.1 Vision and Mission

The national UA objectives and strategies are aligned to the following vision and mission statements:

Vision: Quality communication services that are accessible, available, and affordable and that lead to enhanced and sustainable rural communications development

Mission: To provide an enabling environment and intervention for the development and implementation of communication infrastructure and services in rural and under-served areas

9.2.2 Strategic Objectives

The following are the strategic objectives that shall be used to achieve the above vision and mission statements.

- (a) to achieve effective coverage in rural areas
- (b) to realize effective public access to quality basic communication services in the rural areas
- (c) to make communication services affordable to Kenyans, especially the low-income groups
- (d) to facilitate the development of and access to a wide range of local and relevant content
- (e) to support the development of ICT human capacity required for rural development
- (f) to ensure efficiency in frequency applications processing and equipment type approval
- (g) to create and institutionalize an appropriate institutional framework for UA
- (h) to create a conducive regulatory and licensing framework for UA
- (i) to establish a sustainable funding for UA
- (j) to ensure that rural communications is sustainable

9.2.3 Targets

The study showed that 139 out of 480 divisions are unlikely to be covered by operators in the near future. The distribution of the uncovered areas in the provinces and as a percentage of the total divisions is shown in Table 9.1 below.

Table 9.1: Distribution of Uncovered Divisions

Province	Rural Poverty	Total Divisions	Divisions Uncovered	Districts Involved	Percent of Divisions
9. Nairobi		8	0	0	0.0%
10. Central	31	36	0	0	0.0%
11. Coast	61	40	7	5	17.5%
12. Eastern	58	100	36	12	36.0%
13. North Eastern	70	47	31	3	66.0%
14. Nyanza	64	65	21	10	32.3%
15. Rift Valley	48	149	37	14	24.8%
16. Western	60	43	7	5	16.3%
TOTAL/AVERAGE		488	139	49	29.0%

From this table, the uncovered divisions are in 49 districts. North Eastern has the worst coverage, with two thirds of its divisions uncovered; Eastern and Nyanza provinces, which both have about a third of their divisions uncovered, follow it. The three provinces have some of the worst poverty levels, however. Overall, excluding Nairobi, 29% of the divisions are uncovered.

The baseline survey showed that radio and mobile telephone services have the widest coverage, 82% and 85% of the sample, respectively. If we exclude radio given its wide coverage, we can say that 82% have access to at least one service. If we assume that 82% of the total divisions now have or are likely to have access, then 18% of the 480 divisions do not and are unlikely to have access in the near future. This translates to 86.4 divisions which may difficult to provide services. We can round this off to 90 divisions to be supported in the next five years. The difference from 139 divisions may be accounted for by the inaccuracy in the coverage data. In addition, some of the areas are likely to be covered by the operators because they are not challenging. These are areas, for example, with population densities of least 300 people per square kilometre and with relatively low levels of poverty.

Given limited funding for rural communications, we have set targets for the next five years in the marginal areas not likely to be covered. The targets to be achieved are shown in Table 9.2 below:

Table 9.2: Targets to Be Achieved in the Next Five Years

Service	Indicator	Target
Telecommunications	Rural teledensity	5.8
	People per public access telephone facility	800
Internet	Internet points of presence	1 per district
	Percentage of Internet local content	60-80%
Broadcasting	Percentage of television and radio local content	30-50%
ICT training	Number of ICT training institutions	1 per district
Integrated	Telecentres offering integrated services	1 per division
Affordability	Percentage of disposable income used on communication services	5%

9.2.4 Strategies

The following are the strategies that shall be used to achieve the above strategic objectives and targets.

(a) Coverage

- i. to encourage the exploitation of unused communications infrastructure of existing operators to provide access in the rural areas

- ii. to encourage small operators to obtain rural operator licences
- iii. to give preference in allocation of frequencies that has the greatest reach to rural operators; this will enable operators to reach longer distances and serve more customers per unit cost of equipment
- iv. to encourage national/regional operators to partner with rural-/community-based operators
- v. to zero-rate duties and taxes on equipment designated for the provision of rural communication services and make licence fees tax deductible
- vi. to fund access deficit from the UA fund for operators providing services in targeted areas

(b) Public access

- i. to regularly review the concept of basic communication services; these services are defined initially to include fixed and mobile telephones, Internet, multimedia, letters, philatelic, private letter boxes, and television and radio broadcasting
- ii. to establish and ensure adherence to quality of service standards for rural communications
- iii. to give incentives to entrepreneurs to establish and operate access points offering basic communication services in appropriate locations accessible to the public
- iv. to encourage the development and deployment of appropriate technologies, services and content that ensure non-discrimination, especially for disadvantaged groups (for example, non-text based computer interfaces for the illiterate)

(c) Affordability

- i. to support innovative projects that reduce communication service tariffs in rural areas
- ii. to encourage operators to share infrastructure in rural areas
- iii. to reduce the license and frequency fees for rural operators
- iv. to ensure there is full competition in all the communications sector markets
- v. to review interconnection guidelines and principles
- vi. to introduce the price cap to regulate markets where operators have SMP
- vii. to introduce FL-LRIC interconnection model

(d) Local and relevant content

- i. to support projects and initiatives aimed at developing, translating and adapting useful and socially meaningful content , for example, weather forecasts, product prices, financial advisory services, development radio and television programmes, and academic programmes

- ii. to promote variety in local content production in order to give choice to consumers
- iii. to promote the use of Kiswahili and other local languages in local content preparation and presentation
- iv. to support cost-effective access to local content by rural people, for example, local hosting, and voice-activated access to useful data

(e) ICT training

- i. to create awareness of the communication services available and the impacts they have on rural development
- ii. to support the establishment of local ICT training centres in appropriate “vanguard” institutions in rural areas in each of the targeted districts
- iii. to support relevant ICT training for rural-based people (whether by local training providers or distance learning by large, established institutions, or both)
- iv. to support the development of high-calibre manpower required in the ICT industry

(f) Frequency application processes

- i. to re-engineer processes of frequency application, especially for rural operators
- ii. to computerize frequency application processes, including the electronic completion and submission of application forms
- iii. to make public the status of the Kenya table of frequency allocations, subject to security restrictions
- iv. to make current and potential operators aware of frequency spectrum application and type approval processes

(g) Institutional framework

- i. to establish a new unit in the CCK to be in charge of UA

(h) Regulatory and licensing framework

- ii. to review the current KCA 1998 and the Kenya Communications Regulations 2001 as a short-term measure to give UA legislative authority and ensure the smooth operation of the proposed rural UA/CDF
- iii. to create a one-stop and efficient licensing framework for rural operators
- iv. to review the policy framework for telecommunications and postal services and review operators’ licences with respect to the universal service rollout targets

- v. to draft a new communications act that integrates all communications services
- vi. to review the Postal Corporation Act

(i) Funding

- i. to establish a UA/CDF with diversified sources of income
- ii. to change licences of the operators to reflect their contribution to UA/CDF
- iii. to solicit funds from other sources
- iv. to ensure fair access to and effective utilization of the UA/CDF and incentives to leverage investment in rural communication development

(j) Sustainability

- i. to develop a consumer forum and build capacity in consumer organizations
- ii. to support initiatives that promote rural communications
- iii. to create an ICT research unit in the CCK
- iv. to annually review the UA policy framework, ensuring that the framework is linked to rural development goals with the full participation of all key stakeholders

9.3 Candidate Projects and Sources of Funding

9.3.1 Candidate Projects

The following projects will be supported from the UA/CDF from 2005 to 2010:

- provision of subsidies to operators and service providers to develop communications infrastructure to provide telephone services to 90 divisions
- provision of subsidies to operators and service providers to develop internet points of presence in 49 districts
- provision of loans to local private entrepreneurs to establish a public access centre (PAC) in each of the 90 divisions; the PACs will range from a simple community telephone, to a telephone bureau, to a cyber café and to a fully fledged telecentre offering a whole range of basic communication, including postal, services
- promotion of local content development through the support of communications content in initiatives
- promotion of ICT capacity building through the support of ICT training facilities in strategic institutions in 18 centres

9.3.2 Sources of Funding

The UA/CDF will have funding from the following sources:

- the Government of Kenya, through duties and tax incentives
- the CCK
- operators and service providers through a fee dedicated to UA/CDF
- donations and grants from development partners and well-wishers

More specifically, the initial sources of funds are as follows:

- **Telecommunications operators.** We have proposed that these operators pay an additional 0.5% of gross revenue, making the total levies 1% of gross revenue. In Uganda, Peru and Columbia, the total levies are 1%, 1% and 2% of gross revenue respectively. The levies in Kenya therefore are in line with levies in other countries.
- **Postal and courier operators.** We have proposed that these operators pay an additional 20% of their respective current annual fees. In most countries, including Uganda, these operators pay 1% of their gross revenue, which is much higher than the current annual fees in Kenya.
- **CCK.** We have proposed that the CCK gives seed funds of KShs. 20m to start off the fund each year in 2004/2005. This will be used to start off a pilot project. In addition, the CCK will make a 1% contribution of its gross revenue from 2005/2006.

Table 9.3 below shows the actual contributions of the various sources.

Table 9.3: Estimated Revenue to Fund UA (KShs. 000,000)

	Gross Revenue of Telecom Operators	Safaricom	18,000.00	18,900.00	19,845.00	20,837.25	21,879.11
		Kencell	7,000.00	7,350.00	7,717.50	8,103.38	8,508.54
		TKL	16,000.00	16,800.00	17,640.00	18,522.00	19,448.10
		Others	1,000.00	2,000.00	3,000.00	4,000.00	5,000.00
	CCK Gross Revenue		1,700.00	1,785.00	1,874.25	1,967.96	2,066.36
Source	Year	2004/2005	2005/2006	2006/2007	2007/2008	2008/2009	2009/2010
	CCK (initial seed funding and regular contributions)	20.00	17.00	17.85	18.74	19.68	20.66
Levies on telecom operators							
	% of gross revenue		0.50%	0.50%	0.50%	0.50%	0.50%
	Safaricom		90.00	94.50	99.23	104.19	109.40
	Kencell		35.00	36.75	38.59	40.52	42.54

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Telkom Kenya			80.00	84.00	88.20	92.61	97.24
Others (existing and new operators)			5.00	10.00	15.00	20.00	25.00
Postal and courier operators							
Additional % of annual fees			20%	20%	20%	20%	20%
	Annual fees						
PCK	4.000		0.800	0.840	0.882	0.926	0.972
International in-bound operators	0.640		0.128	0.134	0.141	0.148	0.156
International operators	8.800		1.760	1.848	1.940	2.037	2.139
Regional operators	0.800		0.160	0.168	0.176	0.185	0.194
Intra-country operators	3.072		0.614	0.645	0.677	0.711	0.747
Intracity operators	1.056		0.211	0.222	0.233	0.244	0.257
Document exchange operators	0.024		0.005	0.005	0.005	0.006	0.006
Total (KShs.)		20.000	230.883	247.167	264.015	281.456	299.519
Total (US\$ @ 81)		0.247	2.850	3.051	3.259	3.475	3.698

The assumptions in arriving at the above estimates are:

- the CCK gives seed funds of KShs. 20m to start off the fund in 2004/2005 and makes a 1% contribution of its gross revenue from 2005/2006
- telecommunications operators start making contributions to UA in 2005/2006 at an extra 0.5% of gross revenue
- existing and new telecommunications operators ("others") are assumed to have an initial turnover of KShs. 1 billion; the business volume increases by KShs. 1 billion every year
- postal and courier operators make an additional 20% contribution of existing annual fees. However, there is an outcry by the courier operators that the current annual fees are high. It might therefore be necessary to review these fees to reflect their business operations.
- all contributions go up by a conservative 5% every year

It is to be noted that contributions of other categories of operators and operators, notably ISPs and PDNOs, have not directly been factored in. Their contributions has been lumped together under the "others" category. It is also important to note that the money from the CCK in 2004/2005 will go towards carrying out a pilot, which is outlined in the recommendations in chapter 10.

At the same time, it needs to be noted that the above funding is the minimum funding required. With aggressive fund-raising initiatives by the proposed UA Communications Development Board (UA/CDB), it is possible for both the government and development partners to make contributions. This would then go either towards further reducing the levies on the operators and service providers or increasing the number of projects. Further, the amount of revenue is much higher than the cost of supporting the provision of services to targeted areas. This means that the UA/CD can be expanded to cover more areas than planned for in this report.

9.4 Institutional Governance and Management

9.4.1 Role and Functions

This sub-section gives the role and functions of the institutional arrangement best suited for the successful administration of UA/CD, especially in the rural areas, based on best practice in similar countries.

It is recommended that a separate unit, to be referred to as the UA/CDU, is to be created within the CCK. The role of UA/CDU is to plan and oversee the implementation of UA projects. The specific functions of the unit are:

- to develop the strategic plan and prioritize the annual programme and priorities of UA projects
- to award subsidies through the most suitable mechanism, for example, a public competitive bidding process
- to administer, monitor and evaluate the implementation and impact of funded projects
- to manage the finances of the unit
- to publish annual reports on funded projects as may be required by the stakeholders

The CCK shall appoint a manager, to be referred to as the UA/CDU Director, and allocate appropriate staff to be in charge of the day-to-day activities of the UA/CDU. The CCK shall establish a UA/CDF, which shall be used to fund the development of communication services, especially in rural areas.

9.4.2 Separate Board

There shall be a separate board, called the UA/CDB whose main function shall be to monitor and approve the UA/CDU's programme and activities and monitor its financial activities. The board shall include representation of the key stakeholders.

The UA/CDB shall have the following membership:

- the DG, CCK
- the UA/CDU Director--to be secretary
- a representative of telecommunications sub-sector
- a representative of postal sub-sector
- a representative of broadcasting sub-sector
- a representative of a recognized consumer association
- a representative of the Ministry of Information and Communications (ex-officio)
- a representative of Ministry of Finance (ex-officio)
- a representative of Ministry of Planning and National Development (ex-officio)

To avoid potential conflicts of interest, representatives of the communications sector cannot be owners, shareholders, partners, or employees of licensed communications operators in Kenya. To be appointed to the board, candidates shall provide a written statement in which they declare that they do not have conflict of interest; this is the case in Uganda.

The board shall hold meetings every quarter. The chairman of the board shall be appointed by the minister in charge of communications.

The operating procedures of the UA/CDB shall be in line with the CCK's regulatory authority as the board executes part of the mandate of the CCK. In the event, for whatever reason, the UA/CDB ceases to exist, the CCK shall assume its responsibilities and functions of the board, for at most six months.

9.4.2.1 Appointment of Board Members

The minister in charge of communications shall appoint members of the UA/CDB upon receipt of proposals from the CCK. The term of appointment to the board shall be three years.

Fees and re-imbursable expenses payable to board members who are non-employees of the CCK or the government shall be in accordance with the official CCK policy.

A board member's position on the board shall be vacated if the member's ownership or employment in the communications sector becomes a conflict of interest, if the member is inactive through non-attendance of at least three consecutive regular board meetings, or if other conditions render a board member unable to discharge one's duties. In this case, the UA/CDU Director shall initiate a procedure to replace the board member.

9.4.2.2 Authority and Responsibilities of the Board

The board shall have approval authority over the UA/CDF. It however shall be accountable for its actions to the CCK. In addition, its actions shall be consistent with the UA strategic plan and these procedures.

The board's primary responsibilities shall include but shall not be limited to:

- approving the UA/CDF programme
- approving the UA/CDU operating budget
- approving all staff appointments other than the UA/CDU Director
- approving consultancy and outsourcing contracts
- approving all decisions awarding contracts on tendered projects
- regularly approving quarterly reports on direct disbursements for small projects
- monitoring the UA/CDU's quarterly financial reports and Annual Report

9.4.3 Dedicated Staff

The UA/CDU shall be responsible for technical and administrative work of UA. Employees of the unit shall be employees of the CCK but dedicated to the work of UA/CD in designated rural areas. The establishment of the unit shall comprise of only a few staff and shall be determined by the UA/CDU Director once appointed and reviewed regularly depending on the project activity levels.

The CCK shall appoint the UA/CDU Director. He/she will have the rank of Director in the CCK and shall provide overall management and day-to-day running of the unit. He/she will be answerable to the UA/CDU Board and shall have the following responsibilities:

- review the UA/CDU's investment targets, project plans and budgets
- identify and prepare projects for funding
- prepare and maintain the unit's human resources plan
- prepare, monitor and control the unit's operating budget
- develop terms of reference or tasks for unit staff or external consultants
- participate in the selection and supervision of consultants
- participate in raising awareness associated with rural UA/CD programme
- monitor and follow up payment of levies into the UA/CDF by contributors and answer any queries raised
- liaise with operators involved in rural projects
- initiate fund-raising proposals for the UA/CDF
- ensure budget control for the UA/CDF and project resources

- prepare progress reports for the Director-General of the CCK and the UA/CDU Board

9.4.4 Part-time Staff and Consultants

In addition to the few dedicated staff, the UA/CDU may request the CCK to second staff on a part-time or limited full-time basis depending on need. With the approval of the board, the UA/CDU may outsource some of the work to external consultants where this is deemed to be more appropriate. This includes, for example, loan processing and administration and disbursement of minor subsidies. Hiring consultants and administering their contracts is the responsibility of the UA/CDU Director or of a special sub-committee appointed for that purpose.

9.4.5 Finances

All finances are governed according to the UA/CDF's Annual Operating Budget and must be in line with the CCK's financial policies and regulations. The UA/CDU shall establish its own separate account in a local and reputable bank. The assets of the UA/CDU may be appropriately invested with the approval of the UA/CDU Board.

9.5 The UA/CD Programme and Project Prioritization

9.5.1 The UA/CD Programme

The UA/CD programme shall be determined by the funds raised and the prioritized projects in the UA strategic plan. The UA/CD programme annually and for the next five years is summarized in Table 9.4 below.

Table 9.4: Summary of UA/CD Programme

No	Project Area Supported	Units	Quantity	Unit Cost (US\$)	Subsidy	Total Cost (US\$)	Cost per Year (US\$)
1	Telephone infrastructure	Lines	100,000	250.00	30%	7,500,000.00	1,500,000.00
2	Internet POPs	Numbers	49.00	60,000.00	30%	882,000.00	176,400.00
3	Public access centres	Numbers	90.00	11,500.00	100%	1,035,000.00	207,000.00
4	Local content	Contracts	50.00	30,000.00	100%	1,500,000.00	300,000.00
5	ICT training	Centres	18.00	76,000.00	100%	1,368,000.00	273,600.00
TOTAL						12,285,000.00	2,457,000.00

This programme shall be reviewed and revised annually by the UA/CDU Director, in consultation with the CCK's Director-General. It shall then be approved by the

UA/CDU Board and by the CCK. The UA/CDU Director shall prepare year-by-year programmes based on, or an amended version of, this overall one.

Project disbursements should, in principle, be made according to agreed priorities and financial resources available. This will ensure, in the event more subsidy is required than estimated, that the programme can be adjusted accordingly.

It is recommended that the UA/CDU carries out pilot projects and small-sized projects in the first year to refine the methodology and understanding of processes and criteria to be used in the larger and higher priority projects.

9.5.2 Prioritization of Projects and Locations

The UA/CDU shall select projects and locations which are commercially viable in the short- to medium-term but that require an up-front subsidy. The viability information will be obtained from tender proposals by operators and service providers. This is because bid documents provided to bidders will require tender proposals to demonstrate viability in the short to medium term and ability to meet target performance or set obligations on the basis of receiving a one-time subsidy of the capital investment cost.

Table 9.5 below gives a guideline that can be used to develop a detailed project prioritization procedure.

Table 9.5: Guideline for Prioritization of Projects

Project category	Description	Prioritization Decision
Category 1	Commercially viable, no subsidy required	Excluded from the UA/CD programme
Category 2	Commercially viable but may require a subsidy of less than 20% of investment costs to encourage investment	Highest priority
Category 3	Commercially viable but may require a subsidy of 20%—33.3% of investment costs to encourage investment	2 nd highest priority
Category 4	Commercially viable but may require a subsidy of 33.3%—50% of investment costs to encourage investment	3 rd highest priority. May require further analysis before support
Category 5	Unviable without a major subsidy of at least 50% of costs and may require on-going operating cost subsidy	Not a priority and will not qualify for support

Given the policy is to develop the most viable projects and locations while minimizing the amount of subsidy, the strategy will therefore favour categories 2 and 3 as shown in Table 9.5 above. Category 4 may only qualify after further analysis of viability and if all projects in categories 2 and 3 have been supported.

UA/CDU shall develop suitable methods of establishing the viability of projects and locations to cross-check presentations of the same in the bidders' proposals.

9.6 Bidding and Selection Procedures

9.6.1 Guiding Principles

Giving the experience of Chile in rural communications development, Bjorn Wellenius (Wellenius, 2001) argues that Chile's success can be attributed to the following factors:

- **Heavy reliance on market forces.** Existing and new entrants meeting the minimum eligibility criteria competed for licences to provide services and subsidies are allocated through competitive bidding.
- **Minimal regulation.** Operators have the freedom to design their business solutions, independent of technology, to propose unregulated additional services, and to set all prices for their services except for payphone call charges within the primary calling area and for interconnection charges, which were both fixed.
- **Simple and expeditious processing.** The processing of operating licences and frequency spectrum were handled as a one-stop process with significantly faster and less paperwork than standard procedures. This process was also reduced by almost a half.
- **Competence and effective leadership.** Senior government officials demonstrated effective and sustained leadership while full-time staffs are few, competent and dedicated.

The UA/CDU shall borrow heavily from this experience and be guided by similar principles.

The methods of bidding and selecting beneficiaries for subsidies or loans under the UA/CD programme shall be in line with the public procurement procedures. There are two distinct bidding and selection categories. The first involves telecommunications infrastructure development projects, largely telephone infrastructure and Internet points of presence. These are large projects, typically requiring the support of at least KShs. 5 million from the UA/CD programme. The process of selection shall be through public bidding. The second involves the development of telecentres, content development and ICT training centres. This will be a public bidding process but with less stringent bidding and evaluation requirements. In this sub-section, we outline the procedures required for the two categories.

9.6.2 Category 1: Telecommunications Infrastructure Operators

9.6.2.1 General

The bidding documents and requirements shall be determined by UA/CDU, in liaison with the relevant sections of the CCK, at the time of preparing the tender documents and in line with public procurement guidelines. The documents shall include the UA/CD programme, description of the specific project(s) being tendered, technical and operational specifications, technical and financial evaluation criteria and draft-operating licence. The following main points will need to be incorporated, however.

- **General.** Public tenders to develop communications and ICT infrastructure shall offer a 10-year operating licence to provide services in the targeted areas. The licences will allow operators to provide designated services as well as other allowable services.
- **Eligibility.** In general, bidder requirements shall be kept to a minimum to encourage a wide variety of companies to bid. Those eligible to bid are existing companies, which have relevant experience for at least three years. Start-up companies qualify to bid but must demonstrate expertise, through qualified permanent senior staff, that they have requisite managerial experience in companies providing similar services. All bidders must demonstrate financial stability.
- **Obligations.** Obligations of the operator shall be specified in the licence. For the telephone infrastructure, this is one public access telephone facility per sub-location and a public telecentre for each Internet point of presence developed.
- **Services and technology.** The requirements for network infrastructure development shall be technology neutral, in line with the CCK's new licensing framework.
- **Market dominance.** Tenders shall be designed in a way that will not allow an operator to use them and the subsidies offered to establish market dominance. There therefore shall be a maximum cap of how many areas a single bidder can be awarded. It is suggested that this number is large enough to be attractive to bidders but small enough to avoid creating a situation of market dominance.
- **License area guidelines.** Multiple license areas shall be offered per tender.

9.6.2.2 Tender evaluation and selection criteria

The UA/CDU shall develop criteria for evaluating and choosing bidders. The technical criteria shall include but shall not be limited to the following:

- extent of meeting the minimum corporate qualifications
- extent of meeting the minimum service level targets
- whether the required quality of service levels are guaranteed
- whether the proposed tariffs are within the allowable limit for rural access
- degree to which the present and future service requirements of the designated area have been met
- whether the technical solution is proven, with at least one reference project
- the operator network presence in the region or neighbourhood of targeted areas
- the competitiveness of the proposed rollout timeframe
- the quality of the company as depicted in the company profile, including its track record, years of operation, management capacity, resource capacity, and experience and support capability

Financial evaluation will be carried out for only those bidders who meet the minimum mandatory technical criteria. The key financial criteria for choice are the lowest required subsidy.

9.6.3 Category 2: Telecentres, ICT Training and Content Development

The tendering procedures and documentation shall be less extensive than for category 1. The specific tendering process, phasing and bid evaluation methodology shall be determined and approved by the UA/CDB on a case-by-case basis.

Each bidder will be required to submit an application and a business plan, which shall be required to, among others, include:

- a definition of the user community
- user needs and demand that the project will address
- costs of all items required, including staff costs
- tariffs for the various services to be provided
- plans for depreciation and replacement of equipment, where relevant
- cash flow and profitability projections, where relevant
- demonstration of any necessary partnerships to provide services, especially on-going support services
- leadership, management and training resources required
- demonstration of financial viability and specifically how the project will be sustained in the long term
- financial plan, including investment costs, recurrent costs, anticipated revenue and financial contributions by the owner/entrepreneur or community

UA/CDU shall provide the format of the application form and business plan.

The general evaluation and selection criteria shall include:

- demonstration of the ability to raise at least 20% of the total project investment cost
- the quality of the business plan, including minimum levels of investment required
- demonstration that the provision of services borrows from best business practices
- the duration before the project becomes self-sustaining
- the human capacity to implement, operate and manage the project; the training needs of staff shall be clearly identified and costed
- availability of other infrastructure, especially power and roads
- evidence of formal registration of business concern

9.7 Disbursement Procedures

All UA/CDF subsidy or loan disbursements for the pilot and the main programme shall be made in tranches. The first tranche will be a down payment upon signature of the service agreement or subsidy contract spelling out agreements and obligations, followed by one or more subsequent payments upon certified completion of the investments and the establishment of project or service.

For category 1 tendered contracts (development of telecommunications infrastructure) a maximum of 15% shall be paid at contract signature. Further payments shall be paid on meeting specified project milestones. The following milestones shall act as a guide:

- delivery of equipment
- commissioning of equipment and start of service provision
- final holdback payment (maximum 15%) upon completion of a short but sufficiently practical period following the commissioning date (for example, six months) to verify that minimum agreed service quality standards are being met

Commissioning and final service quality standards milestones shall be evaluated by the UA/CDU or by an appointed independent consultant.

The disbursement of category 2 tendered projects, with the exception of content development³⁶, shall be outsourced to a micro-finance institution (MFI)³⁷. The disbursements shall be agreed in accordance with reasonable cash flow requirements of entrepreneurs or institutions carrying out the project as per their business plans.

In this category, the disbursement shall be made in at least three stages depending on the nature of the project. The first will be upon the presentation of an invoice for equipment purchase and set up. The balance shall be at set milestones, including inauguration (the first day of operation) and other operational milestones. The final payment shall be subject to a final holdback payment covering a brief but practical in-service verification period, which shall be set in accordance with the realistic expectations of the UA/CDU and the requirements of the various classes of the beneficiaries.

The final in-service cutover shall be witnessed and/or verified by a representative of the UA/CDU.

9.8 Monitoring and Evaluation

9.8.1 Importance of Monitoring

The key reasons for monitoring are:

- If disbursement of funds is tied to milestones, monitoring will establish if targets have been met and the service provision is satisfactory.
- The monitoring should act as an early warning system and detect potential abuse and/or difficulties and help to address and rectify any problems early in the process.
- The monitoring can provide feedback to the design of subsequent projects, reduce the cost and/or increase the efficiency of post evaluation studies, thus improving the learning cycle for strategists and planners.

It is therefore important that a monitoring plan be included in the project planning and development phases. This plan includes what should be monitored and why, the timeline for monitoring, the resources required, the responsibilities and how the results of the monitoring process are recorded and used. Both the UA/CDU and the project owner or implementer shall be part of the monitoring effort.

³⁶ Content development support shall be treated like category 1 projects. The milestones however will be different in line with the nature of these types of projects.

³⁷ The MFI, which shall also administer the loan repayments by beneficiaries, shall be selected through competitive tender using category 1 procedures. By providing loans rather than grants, the CCK will be creating a revolving fund that will be used to provide micro-credit loans to entrepreneurs in other under-served areas.

The UA/CDU shall allocate staff and resources and develop tools and procedures for on-going monitoring, such as the following:

- an up-to-date and reliable database of all the projects' facilities and services, including service rollout status, service quality and possibly usage statistics
- proactive assessment of performance through a combination of field visits, basic user and project owner interviews, and telephone surveys as may be appropriate
- a process of filing and resolving of customer or project-owner complaints/difficulties and comments
- open communication (for example, through regular meetings) between the UA/CDU and the project owner on the process and progress of the project

The database and data input process shall be managed and updated by the UA/CDU with the requisite data supplied through a system of reports and service checks to maintain relevance. The staff managing the database shall be dedicated to that purpose.

The inputs can come from external sources through:

- forms and procedures established by the UA/CDU developed during the planning stage, which shall form part of the responsibilities of the project owner
- own or outsourced personnel contracted to collect, analyze and supply data

9.8.2 Monitoring Project Status

Overall monitoring can be strengthened when monitoring and enforcement mechanisms are built into the regulatory framework and become part of the licence requirements. To this end, the UA/CDU shall require quarterly reports from operators and other project owners, showing statistical returns of all the items that were planned to be monitored. This will help monitor project implementation performance against licence. For an operator, for example, the quarterly report shall include:

- the total number of lines
- network extent and coverage, total and by district and division
- percentage of completion
- summary of the previous month, for example, public access facilities commissioned

- current status of obligation achievement

9.8.3 Monitoring Service Quality

The database mentioned in 9.8.1 above includes service quality requirements and operator compliance. The minimum quality related issues to be monitored for an operator are shown in Table 9.6 below:

Table 9.6: Service Quality Monitoring

Service Quality Issue	Activities
Comments and complaints	The UA/CDU shall publicize the number to call for customers or service retailers to make enquiries or lodge complaints regarding the service of the operator in the area The UA/CDU will keep and file a call record with simple database format to facilitate both qualitative and quantitative analysis and response
Faults and repairs	Operators will be required to organize and publicize their own retailer and customer service centre number, and equip themselves with an operational support and customer care system that will facilitate good response, and to report to UA/CDU fault statistics, fault diagnosis and time to repair
Service completion	Operators must be able to measure and report service completion statistics and to identify bottlenecks in their systems and points of interconnection
Traffic	Operators must report both incoming and outgoing traffic
Billing and retailer support	Operators must be able to deliver to their public access facility retailers complete summaries of per call outgoing and incoming call times, monthly summaries showing calls, average times, total call time, financial amounts owing and account balance

9.8.4 Evaluation and Enforcement

The evaluation of the various projects is important to find out if the strategy and plans have worked, if they resulted in the intended purpose and if they created the expected impact. The results will form a good basis for future UA strategies. The evaluation of the UA/CD programme may be outsourced through tender and therefore UA/CDF should have some funds set aside for this purpose.

The evaluation shall determine whether the project achieves relevant UA objectives and targets, meets stipulated quality of service standards, is sustainable and/or achieves the intended or expected impact. Failure to meet minimum acceptable standards or to use incentives in designated under-served areas shall carry financial penalties. Operators, who have serious violations on the provisions in their licences or their contract with the CCK, over an extended period, may have their licences terminated.

10. Recommendations

This report has provided a detailed analysis of the provision of communication services in Kenya. Using this analysis, the report has developed a strategic plan for UA to communication services, with the necessary targets to be achieved in the next five years and a detailed implementation plan. It has also provided procedures that will be used in operationalizing UA access in the CCK.

In addition to the strategic plan, which contains various recommendations in terms of strategies, we recommend that the CCK carries out the following activities as soon as possible:

10.1 Regulatory Framework

To make the following changes in the KCA 1998 and the Kenya Communications Regulations, 2001, by March 2005:

- a) **The KCA 1998.** Amend the act by adjusting the following sections:
- Insert the following definitions in section 2 (1):
 - i. “communication services” means telecommunication services, postal services, courier services or a combination thereof
 - ii. “under-served area” means an area where communication services available are insignificant or non-existent
 - iii. “UA” means availability of and access to quality basic communication services for all, at affordable prices
 - Insert the following sections after section 17:
 - i. 17A. (1) The Commission shall establish and maintain a fund to be known as the UA/Communications Development Fund.
 - ii. 17A. (2) The Fund shall be administered and managed by a separate board to be known as the UA/Communications Development Board.
 - iii. 17A. (3) The Fund shall be applied in furtherance of the objects of section 23 and section 47. (1) (a) of this Act and in particular, to achieve UA to basic communication services in under-served areas or to such other purposes as the Commission may appoint for the development of communications in Kenya.
 - iv. 17A. (4) The activities of the UA/Communications Development Board shall be funded from the Fund.
 - v. 17A. (5) The Minister in consultation with the Commission may from time to time make regulations with respect to the Fund.

b) **The Kenya Communications Regulations 2001.** Amend the regulations in order to achieve the following:

- To enable the Minister in consultation with the Commissions from time to time to determine the level of contributions to the UA/Communications Development Fund by the licensees through issuance of a gazette notice.
- To determine how money collected from licensees shall be shared between the Fund and the operations of the Commission, particularly when this money are paid in instalments.
- To provide provisions as to the conduct of the business affairs of the UA/CDB. These provisions shall include but shall not be limited to:
 - i. the composition of the board
 - ii. the tenure and vacation of board members
 - iii. the functions of the board
 - iv. disclosure of interests
 - v. identification of projects
 - vi. selection of beneficiaries of the fund
 - vii. disbursement of money from the fund
 - viii. monitoring and evaluation
 - ix. offences
 - x. dispute handling mechanisms
 - xi. relationships between the UA/CDB and the CCK

10.2 UA Communications Development Unit

To appoint the head of the UA/CDU by January 2005. This person will then be able to coordinate the activities of pilot projects. At the same time, at least one project officer must be available on a full-time basis from the time the UA/CD programme is approved by the CCK Board.

10.3 “Sell” the UA Strategic Plan

To “sell” the UA strategic plan to the rest of the rest of the government, operators, development partners, and other key stakeholders. This is largely because the support of key stakeholders is necessary for the successful implementation of the UA/CD programme.

10.4 Policy Implications

To discuss the final report with the National Communications Secretariat with a view to incorporating the policy implications of the UA strategic plan into the draft national ICT policy.

10.5 Interconnection Guidelines and Principles

To conduct public consultation to review the interconnection guidelines and principles.

10.6 Market Structure and Segmentation

To review the market structure and market segmentation, to determine which operator has significant market power (SMP) in which market segments and to set commonly agreed criteria for market definition and SMP assessment. In this review, the following questions, among others, must be answered:

- what are the various relevant costs attributable to interconnection for each operator?
- at the current disposable income levels, what regulatory mechanisms are necessary in ensuring that reductions in interconnections costs are effectively transferred to the end-users?

10.7 Cost Study

To expedite the proposed Cost Study and incorporate, as terms of reference, the following:

- identification of appropriate costs of various communication services in Kenya that can assist in establishment of fair and reasonable tariffs;
- development of upper limit price cap levels for interconnection pricing to be applicable before the introduction of FL-LRIC model;
- recommend appropriate regulatory responsibilities to be allocated to all operators that provide interconnection in Kenya;
- develop criteria for evaluating Access Deficit in the context of underserved areas, recommend appropriate subsidy proportion to cover deficits accruing from interconnection and this subsidy to progressively decline as business expands;
- draw out accounting separation and cost allocation methodology and framework and develop periodic regulatory reporting requirement mechanisms;
- once the various appropriate retail and wholesale costs and relevant end-users, termination, origination, transit, capacity rental etc rates have been identified, a public consultations forum to be held to seek the views of wider stakeholder community. The results of such consultation shall form the basis for implementation of the various rates.

10.8 Convergence Bill

To develop a proposal to draft a convergence bill.

10.9 ICT Research Unit

To establish an ICT research unit to study market trends, collect and collate data, provide first hand information to potential investors, develop targets for various strategic market segments and, in liaison with other relevant departments, participate in periodically reviewing the market structure and licenses.

10.10 Coverage Map

To put the communications services coverage information in this report on a geographical information system (GIS), together with the socio-economic and demographic information on all regions of the country, to obligate, through license conditions, all the operators and service providers to provide their coverage data to CCK on a quarterly basis, and to have the proposed ICT Research Unit update the GIS on a continuous basis. The cost of establishing the geographical information system is outlined below:

Item	Units	Qty	Unit Price (\$)	Total Cost (\$)
1. GIS software				
ArcGIS ArcView Concurrent Use	Licenses	3	3,857	11,571
Extensions (can be bought as and when required)	No.	0	0	-
2. Powerful PC (server) - at least Pentium IV	No.	1	2,000	2,000
3. Digital map of Kenya upto sub-location level	District	75	61.73	4,630
4. Purchase data (power, roads, etc.) & re-organization of data	Lumpsum	1	12,500	12,500
5. Putting it all together by GIS expert	Person days	40	300	12,000
	TOTAL (US\$)			42,701
	TOTAL (KShs)			3,458,751

10.11 UA Operations Manual

To extract chapter 9 of this report make an operational manual that will guide the operationalization of the communications development fund.

10.12 Final List of Underserved Areas

To draw up the final list of the underserved areas after consulting the operators on their coverage plans.

10.13 Piloting

To carry out pilot projects on the provision of selected basic communication services. The need for the following is critical for the success of the piloting:

- criteria to select the areas to be used for piloting based on various socio-economic conditions that are likely to be encountered during the rollout of UA/CD projects
- pilot the business partnership between entrepreneurs and operators
- use of different operators, for example, TKL for fixed telephone and Internet, Alldean for VSAT, Safaricom/Kencell for mobile telephone and one of the ISPs for Internet services
- use of different sectors, for example, education, health, and agriculture,

The candidate projects for piloting include:

- a) **Internet points of presence (POPs).** Establishing communications infrastructure takes a long time to be piloted. However, we envision that the development of Internet POPs would take a relatively short time, especially for TKL and Alldean. We therefore propose to establish two Internet POPs in some of the 90 divisions targeted in selected districts with unserved areas. With the unit costs and subsidies proposed in chapter 7, the total cost is US\$ 36,000.
- b) **Telecentres.** The development of two fully fledged community telecentres operated by local entrepreneurs offering telephone, Internet and basic postal services as well as other business centre services such as fax and photocopying. These will be developed in different districts from those for Internet POP pilots. The areas for piloting however must have similar socio-economic characteristics as the targeted unserved areas. The pilot areas must have Internet presence. With the unit costs proposed in chapter 7, the cost of developing two telecentres is US\$ 30,000. It is recommended that CCK works with a micro-finance institution (MFI) to pilot the provision of loans to local entrepreneurs to develop telecentres. This will also enable the piloting of the required arrangements between CCK and MFIs in extending loans to entrepreneurs for provision of communication services. It is estimated the MFI will charge 15% of the loan amount to provide administrative services, including training selected entrepreneurs. The total cost of the telecentre piloting is therefore US\$34,500.
- c) **The provision of postal services through telecentres.** A pilot project on how basic postal services could be provided in a telecentre offering other services. This pilot project will enable the CCK to develop a framework for the further liberalization of this sub-sector and to test a business model for the PCK to offer services through private operators of telecentres. This pilot project can be done in one of the telecentres established in (b) above or in one of the PCK's post offices having Internet access. A lump sum budget of US\$ 15,000 is allocated.

- d) **Local and relevant content.** Institutions that either have or can easily develop local and relevant content to be contracted (for example, NGOs which have been working with communities to develop content relevant to them) to provide this content in health, education, environment, agriculture, or any other priority sector, working with key stakeholders in these sectors. This is particularly in developing ministry and government department portals and making the portal information easily, widely and equitably available to citizens in support of the e-government strategy. This content can be hosted in the two telecentres in the pilot and in other places where the public can easily have access. The provider of the content will carry out some training on the key stakeholders in the relevant ministries or departments, the telecentre operators and the local community. An estimated US\$ 25,000 is required to cover the cost of content development, server purchase, training, and hosting.

The cost of the supporting the above pilot projects is US\$ 110,500 or KShs. 8.95 million. An additional budget will be required to set up these projects and to evaluate these projects. This budget is estimated below.

The pilot projects will enable the CCK to generate interest in the UA/CD programme, to refine its knowledge of the rural markets and to develop its methodology for the main programme. In particular, the evaluation of the pilot projects will provide insights into replicability and scalability as well as sustainability. Other advantages are that the benefits of integrating ICT in rural development will be visibly demonstrated and that the lessons of the pilot projects can be used as a basis to source funding from development partners in various development sectors, for example, ITU, World Bank, UNESCO, and WHO.

The CCK can carry out the pilot projects within the current regulatory framework. The CCK will have to customize public procurement procedures and use them for bidding and selecting service providers.

10.14 Use of Consultancy Services in Piloting

The CCK will not initially have all the requisite human capacity to carry out the pilot projects. The CCK may therefore need to procure consultancy services to work with the newly appointed Director in charge of UA/CDU. The consultancy services will go towards carrying out the following activities:

Major Activity	Detailed Activities	Estimated Cost (US\$)
Prepare projects	Visit two countries with UA programmes for lessons and bench-marking, identify pilot areas, prepare monitoring and evaluation instruments, prepare	36,000.00

Major Activity	Detailed Activities	Estimated Cost (US\$)
	bidding and selection documents and evaluate tender documents	
Monitor projects	Monitor the projects after their commissioning every two months for six months	26,992.59
Evaluate projects	Monitor the performance and impact of the projects, their replicability and scalability and their sustainability	17,612.35
Dissemination	Disseminate the results of evaluation of the pilot projects in a workshop of all key stakeholders	1,851.85
Contingency	Contingency	3,000.00
	TOTAL	85,456.79

The estimated cost of the recommended activities is **US\$ 85,456.79** over a period not exceeding nine months.

10.15 Total Cost of the Pilot Phase

The total cost of the pilot phase, including the cost of supporting the pilot projects and establishing a geographical system on coverage information as outlined above, is thus **US\$ 238,658.79** or **KShs. 19,331,362.00**. The seed money provided by CCK in 2004/2005 can cover all this cost.

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