Uganda Telecommunications

A Case Study in the Private Provision of Rural Infrastructure

Submitted by:

Econ One Research, Inc.
in association with
ESG International

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5th Floor
601 West 5th Street
Los Angeles, California 90071
213 624 9600

Suite 200
1004 Prairie
Houston, Texas 77002
713 228 2700

Suite 1170
1215 K Street
Sacramento, California 95814

Table of Contents

Section | Title | Page

SECTION I – INTRODUCTION

1.1 Case Studies of Private Provision of Rural Infrastructure Services

This report documents the results of a case study of the Ugandan telecommunications industry. The study is one of a series of six studies organized by the Public-Private Infrastructure Advisory Facility (PPIAF), a multi-donor technical assistance facility aimed at helping developing countries improve the quality of their infrastructure through private sector involvement. The studies within the series are meant to examine the experience of private companies in the provision of infrastructure services in rural areas of developing countries. This examination includes factual reporting, assessment of performance and identification of lessons for policymakers, lenders and private companies. Results of each study will serve as an input into a broader study attempting to identify "emerging lessons" in the private provision of rural infrastructure.

1.2 Ugandan Telecommunications

The Ugandan telecommunications industry is a natural focus for a case study, for several reasons. First, the reform program recently undertaken by the Governments incorporates all of the fundamental activities – organizational unbundling, privatization, and introduction of competition and development of a regulatory framework – that must be considered in the context of a reform program for any infrastructure-based industry. Second, there is no doubt about at least the magnitude of the impact of the reforms – the telecommunications industry in Uganda has been dramatically transformed. Third, because Uganda is essentially a rural country, all of the industry activity outside the (small number of) major urban centers directly addresses the questions raised by PPIAF's research agenda. That said, some areas of Uganda are indeed "more rural" than others, and drawing these distinctions, and highlighting their implications, is a core objective of this study.

1.3 Our Approach

This report is meant to provide factual information about the development of the Ugandan telecommunications industry throughout the past nine years, a critical assessment of the extent to which implemented policies and practices have achieved the intended results, analysis of critical issues, and identification of lessons emerging from our examination. We have relied partially on background reading, but mostly on interviews conducted and observations made throughout a two-week visit to Uganda. The consulting team's mission included an extensive set of interviews with Government officials, providers of service, customers and other industry stakeholders; as well as field trips to rural sites. A listing of interviews, with brief descriptions of issues addressed, is included in this report as Appendix A.

SECTION II – RECENT EVOLUTION OF THE UGANDAN TELECOMMUNICATIONS INDUSTRY

Before 1977, telephone service in the Southeast African region was provided collectively by the Governments of Uganda, Kenya and Tanzania. In 1977, Uganda moved away from this regional shared services model by establishing the Uganda Posts and Telecommunications Corporation (UPTC) as a state-owned monopoly provider of telecommunications (and other) services. Service quality was poor, company finances were bleak and there was little innovation. Throughout the past nine years, propelled by a consistent focus on unbundling, liberalization, privatization and regulation, the industry has been transformed[1].

In July 1993, Celtel Uganda (Celtel) became the fist company other than the UPTC to be issued a license for the provision of telecommunication services in Uganda. This license - for only cellular, not fixed-line, service - was established for a 15-year period through an order signed by the Minister of Works, Housing and Communications. The company began providing service in 1995 - to customers located in the urban corridors of Entebbe, Kampala and Jinja in south-central Uganda – using the Global System for Mobile Communications (GSM) technology.

The introduction of Celtel was understood at the time as primarily a mechanism for introducing the private sector and extending the selection of available services, rather than providing a direct competitive challenge to the UPTC, which maintained its status as the monopoly provider of fixed-line service. Although Celtel had significant start-up problems, the success of the Government in attracting a private operator and the success of the company in attracting customers (over 5,000 within three years) highlighted the deficiencies of UPTC and stiffened the resolve to more comprehensively reform the sector. The Government prepared a national Telecommunications Policy early in 1996 that set out, among other things, the following:

- the postal and telecommunications operations of UPTC be unbundled into Uganda Post Limited (UPL) and Uganda Telecommunications Limited (UTL);
- UTL be privatized;
- the telecommunications sector be liberalized; and
- a regulatory agency for the telecom sector be established.

The core motivation driving this policy was that telecom service should be both affordable and widely accessible (and that service quality – with respect to factors such as connection time and service continuity – should improve). It is worth noting one point of omission and one of commission. Unlike similar reform plans in developing economies, maximization of privatization proceeds was not included – either explicitly or implicitly – as a core objective. Instead, in addition to the ever-present focus on quality and affordability, specific reference to system extension (i.e., increasing the geographic coverage of service) was included. These two factors effectively established a link between sector reform and the Government's broader objectives for socio-economic development and poverty alleviation. The core focus on geographic

[1] The term "liberalization" will be employed throughout this report to refer to the introduction of competition.

coverage provided the platform for more specific rural development initiatives in the future, and the low priority of privatization revenues allowed for more flexibility in designing (and imposing) those initiatives throughout the reform (including, most significantly, the licensing) process.

One year later the Government took steps toward operationalizing its telecommunication sector reform program by promulgating the Communications Act, which did the following:

- established the Uganda Communications Commission (UCC) as the industry regulator and the Uganda Communications Tribunal as the agency responsible for resolution of disputes within the industry;
- provided for the incorporation and privatization of UTL;
- provided for competition in basic telephone service through the licensing of a second national operator (SNO)[2];
- required operators to provide payphones and public call offices and related services in rural areas; and
- established a fund for rural communications development, to be administered by the UCC.

The expectation was that the UCC would immediately take on regulatory responsibilities, the UTL would be privatized quickly and then the SNO would be licensed - unlike Celtel, which provided only mobile service – to compete directly with UTL in the provision of the full range of services (fixed-line, mobile and international gateway access). Things turned out differently.

The Communications Act required UTL to be privatized before licensing the SNO. Responsibility for coordinating both these activities rested with the Privatization Unit within the Ministry of State for Privatization. Soon after passage of the Act, the Government of Uganda, led by the Privatization Unit, made the strategic decision to bring in the SNO before privatizing UTL. The hope and belief was that the emergence of the new operator would serve to drive the UTL privatization. The Communications Act was amended to allow for the revised ordering of activities.

An international competitive tender for the SNO license was completed at the end of 1997 and the winner, Mobile Telephone Networks (MTN) Uganda Limited, received its license for full service provision in April 1998 and began operating six months later.

The UTL privatization (for a 51 percent stake in the firm) ended up requiring three tries. The first attempt in February of 1998 garnered four prequalified consortiums, but yielded just a single bid.[3] Negotiations with the sole bidder, Telekom Malaysia, fell apart, in part due to the impact of Asia's Financial Crisis on the firm's financial flexibility. The second attempt was organized and implemented quickly in the second half of 1998, with little adherence to international standards and best practice (investors were not even provided the opportunity to conduct due diligence before submitting bids). Bid organizers hoped that a private investor could quickly be found to help UTL compete with an MTN that was rapidly gaining market share. Five consortiums

[2] The terminology employed here – Second National Operator – reflects the extent to which Celtel, the provider of GSM services – was seen as providing a service fundamentally different from UTL's.

[3] The four prequalified consortiums were Telekom South Africa, Portugal Telecom / Aga Khan Fund, WorldTel/Detecon, and Telekom Malaysia.

prequalified, but again only one bid was received, from WorldTel / Detecon for $US23 million plus future deferred payments. This consortium disbanded before the deal was closed.

The third attempt to privatize UTL occurred in 1999 when MTN was, through its success, revealing a more robust market than most had expected. Two bids were received – from Mahanagar Telecom (US$21.15 million) and Detecon / Telecel (for US$33.52 million) - and the sale of the majority stake was completed in June 2000. This third attempt was a clear success.[4]

While the UCC was throughout this period formally recognized as the industry regulator, the Privatization Unit was in fact conducting a great deal of traditional regulatory activity. This occurred for several reasons: (i) the regulator, having recently been established, was just beginning to recognize its authority and establish its credibility; (ii) the head of the Privatization Unit was determined to seize all opportunities to advance the cause of privatization and competition; and (iii) the SNO license, the end result of a competitive tendering process run by the Privatization Unit, incorporated not just the usual language authorizing operations and establishing a platform for ongoing regulation, but also significant amounts of (very specific) industry policy.

Bidders for the SNO license were required to present expansion plans and these were, along with proposed prices for service, the primary basis for bid evaluation. The expansion plans from the winning bid were incorporated directly into the license as requirements. MTN is thereby required to provide telephone service to every County in the country by 2005, and 89,000 subscriber lines and 2,000 payphones across the country by 2003. The UTL license, issued by UCC after the sale of the majority stake, requires the company to provide telephone service to every County in the country, 100,000 subscriber lines and 3,000 payphones by 2005.

These license obligations do not specify the type of telephone service to be provided. While policymakers hoped for and expected MTN to compete directly with UTL for the provision of fixed-line service, the reality has been different. MTN focused immediately on GSM service – the same as provided by Celtel – and quickly established itself as the dominant telecommunications company in Uganda (with over 220,000 customers today).[5] This expansion exceeded just about everyone's expectations. UTL is now moving aggressively into GSM provision. While GSM technology is, from a cost and business perspective, ideally suited to parts of Uganda (particularly peri-urban and some rural areas in the southern and central parts of the country), it has, from the Government's perspective, a deficiency – it may not provide as strong a foundation as fixed-line service for supporting additional Information and Communication Technologies (ICT) services. So, while expansion has occurred, it has been implemented in a manner different – for better (faster expansion) and perhaps also for worse (weaker foundation for future services) – than originally conceived.

[4] The *East African* newspaper characterized the sale as "perhaps the fairest and most transparent privatization anywhere on the African continent."

[5] It is not clear – nor is it a primary concern of this report – how MTN was able to enter and so quickly dominate a market Celtel had begun developing several years earlier. Celtel managers clam that MTN entered at an opportune moment, when prices for equipment had fallen precipitously and Celtel was struggling to revise its reputation after problems throughout its start-up. MTN managers focus on different factors in explaining the result.

In exchange for taking on the service obligations documented in the license, MTN and UTL were established as the exclusive providers of full telephone service (fixed-line, mobile and international gateway access) through 2005. Services provided before the SNO license was signed – in particular, Celtel's mobile service – are grandfathered. This quid pro quo quality of policy development (trading off competitive advantage for service obligations) was recently extended to Celtel. The firm's license was revised to allow for more options for routing its international cellular traffic in exchange for rollout obligations.

As Uganda is predominantly a rural country (everything outside the city centers of Kampala, Entebbe and Jinja qualifies as rural), practically all the recent expansion of telephone service has been to rural customers. That said, while this expansion has been impressive (since 1995, the number of telephone subscribers has grown from less than 40,000 to more than 400,000), the penetration has not yet extended to the most difficult rural areas (the northern portion of the country and, within the central and southern regions, the areas surrounding, but still remote from, secondary towns). The policy response is contained in the Rural Communications Development Policy of 2001, which emphasizes an increased commitment to the Rural Communications Development Fund (RCDF), a new policy mechanism focused explicitly on rural telecommunication improvement and universal access. The RCDF is administered by the UCC with the intent of subsidizing service in parts of the country identified by the operators as not viable on purely commercial terms.

The RCDF will focus on not only furthering the already impressive advances of telephony, but also jump-starting the use of a wide range of ICTs throughout the country. While there has been some ICT development in a few major urban centers – as evidenced by growing numbers of Internet service providers and cyber cafés - there is little ICT use in rural areas. This reflects some combination of a lack of interest in, an inability to pay for, and a lack of understanding of, these services. The Government has recently outlined its strategic response within the "National Information and Communication Technology Policy Framework for Uganda."

SECTION III – TELECOMMUNICATIONS SERVICES AND SERVICE PROVIDERS IN UGANDA

The exclusivity provisions in the MTN and UTL licenses establish these firms as the only providers of telephone services until 2005. The only exception is for services provided before the MTN license became effective – in particular, Celtel's mobile service. – which are grandfathered.

The resulting market structure is generally referred to as a "duopoly;" but this is misleading for two reasons. First, it references the area – fixed-line service – where policy was originally focused rather than the area – mobile service – where market activity is most dynamic, and three companies are actively competing. Second, and more fundamentally, by focusing only on the infrastructure portion of the business, this term deflects attention from one of the most exciting aspects of the industry's evolution – i.e., the growing number and diversity of providers that bridge gaps between the major providers and end-users by supplementing and making more accessible the core infrastructure-based services.

The purpose of this section is to provide background information about the three major providers of telephone service and to highlight the vibrancy of the broader Ugandan telecommunications markets by introducing several additional, albeit much smaller, commercial players.

A categorization, along with brief descriptions, of telecommunications services provided in Uganda is contained in Appendix B.

3.1 The Major (Voice and Data) Network Operators

3.1.1 Uganda Telecommunications Limited (UTL)

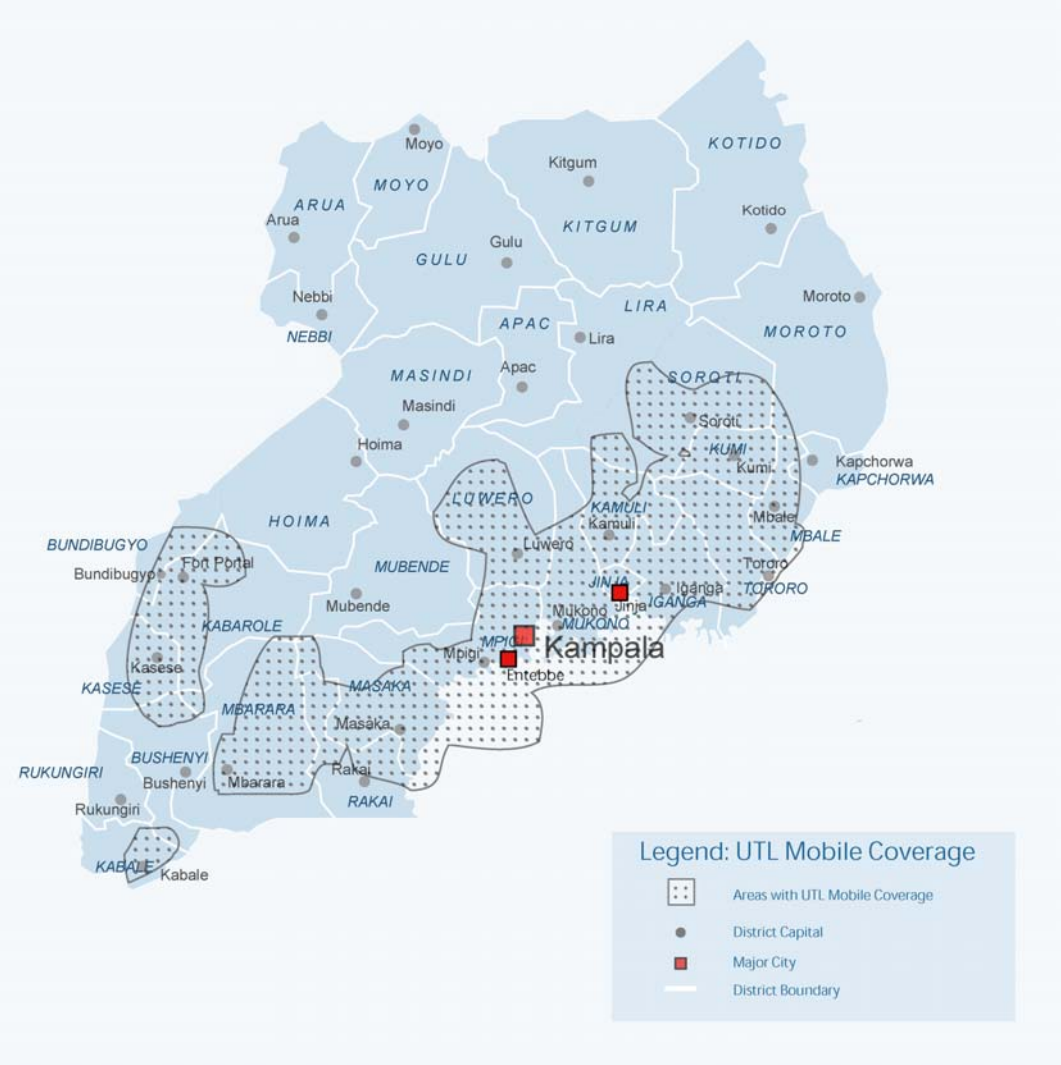
Uganda Telecommunications Limited (UTL) was established in 1998 as a state-owned monopoly provider of telecommunications service after being unbundled from the UPTC. UTL was privatized in June 2000. UTL is now majority-owned (51 percent) by the UCOM consortium composed of Switzerland's Telecel International, Germany's Detecon and Egypt's Orascrom. The Government retains a 49 percent stake in the company, which it intends to sell (preferably through a local stock exchange). The UCOM consortium maintains "full management control," although the Government-appointed Chairman of the Board retains veto power in some areas.

UTL is organized within three main business divisions, one for each of the three core services offered: (i) Uganda Telecom provides fixed-line telephone service to approximately 65,000 customers (it is by far the largest provider of this service in the country); (ii) UTL Telecel provides mobile (GSM) telephone service to approximately 75,000 customers; and (iii) UTL Online provides dial-up Internet service provision and high speed data service.

UTL Telecel is a recent start-up that began offering mobile services through its brand name Mango in 2001. While Telecel provides a limited amount of post-paid service for credit worthy (often corporate) customers, the large majority of its service is, as for all mobile providers in

Uganda, on a pre-paid basis. With 47 base stations in the country, Mango provides services in 10 major urban centers of Uganda (namely, Kampala, Entebbe, Mukono, Jinja, Iganga, Mbale, Tororo, Masaka, Mbarara and Kabale) and their surrounding areas. Value-added services include voicemail, caller ID, SMS, call waiting, and international calling. Figure 3.1.1 shows UTL's mobile coverage in Uganda as of end of 2001.

FIGURE 3.1.1 – UTL MOBILE COVERAGE[6]



UTL Online is currently establishing fiber optic cable links between Kampala and Entebbe, and to some of UTL's core service buildings. There was a 60% growth rate last year in customer requests for (copper-based DSL) data lines. With its own international gateway and access to a large base of customers with fixed-line access, UTL Online appears poised to substantially increase its ISP activity.

[6] Source: Coverage Area-GSM World's Website

3.1.2 MTN Uganda (MTN)

MTN Uganda (MTN) was licensed in April 1998 as the country's Second National Operator after winning a competitive international tender. The parent company is MTN South Africa,[7] which has, in addition to Uganda, operations through subsidiaries in Swaziland, Rwanda, Cameroon and, recently, Nigeria.

MTN began commercial operations in Uganda in October 1998 offering fixed-line, mobile, payphone and data service.

The bulk of the firm's telephone and data services are provided with GSM cellular technology. These mobile services are available with two payment options: post-paid and pre-paid. The pre-paid card system is overwhelmingly the most popular choice. Value-added services include voicemail, SMS and the newly launched (with an aggressive marketing campaign) SMS Info, an information system where users can access data such as commodity prices, weather, and exchange rates.

With its 170 base stations throughout the country, MTN currently boasts approximately 230,000 mobile telephone customers (97 percent pre-paid), making it the largest provider in the country. The MTN network covers over 70 cities and towns, representing 50 percent of the population (95 percent of the urban population and 35 percent of the rural population). The firm has just recently introduced the "Euroset" phone, which can be charged by a small solar panel.

Figure 3.1.2 shows MTN's mobile coverage in Uganda as of end of 2001.

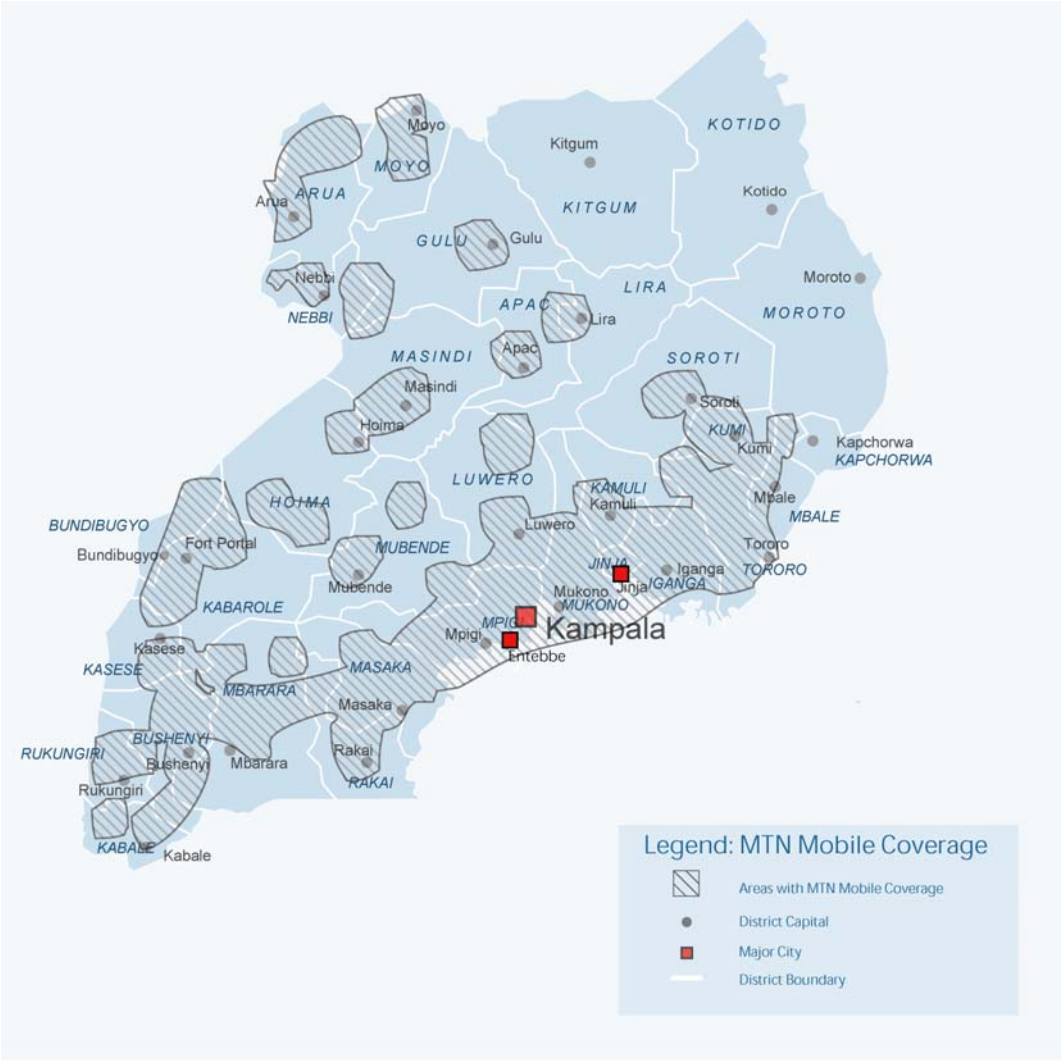
MTN is planning (for 2003) to expand its fixed line services through CDMA digital wireless local loop (WLL) services that are targeted for the Kampala Central Business District and Industrial Area, and other major towns. These systems will offer basic telephony at 32 Kbps or 64 Kbps, as well as ISDN services. A variety of subscriber terminals (STs) will provide services ranging from a standard dual line to 16 terminals and high-speed data lines. WLL services generally have lower capital costs than mobile cellular services. MTN is planning to use its existing GSM towers and base stations for this fixed wireless deployment.

MTN Publicom was established in 1999 as a subsidiary of MTN, in association with Ascom Nordic of Denmark, to provide (as required by MTN's license) fixed wireless GSM payphone services throughout the country utilizing the MTN network. The firm operates 2,300 public payphones in the country, mostly maintained by independent dealers. Approximately 30,000 calls/day are made from MTN Publicom booths.

To enhance customer access to data services, MTN has recently begun deploying fiber optic cable within Kampala and nearby industrial areas. Roll out to other areas is being considered.

[7] Telia, Invesco and Tristar SARL also hold shares in MTN Uganda.

FIGURE 3.1.2 – MTN MOBILE COVERAGE[8]



3.1.3 Celtel Uganda (Celtel)

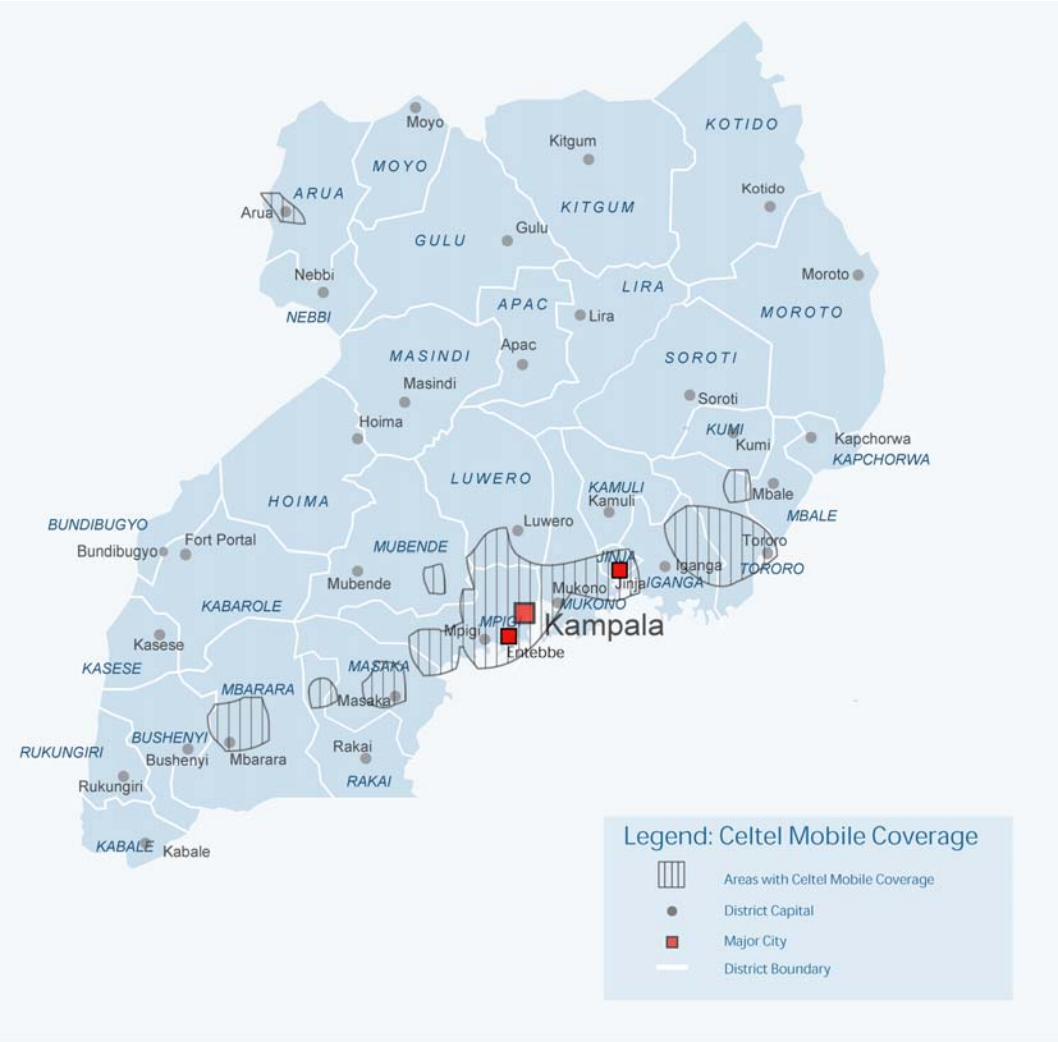
In September 1993, Celtel Uganda (Celtel) became the first private operator licensed to provide telecommunications services in Uganda. The license is for 15 years (until 2008) and provides for only mobile service. The company - owned by a consortium including Vodafone, Mobile Services International, the Commonwealth Development Corporation and the International Finance Corporation - started commercial operations in June 1995 and provides voice, fax and data services.

Celtel operates 43 stations throughout the country in Kampala, the northwestern districts of Arua, Koboko, Moyo and Adjumani, and "border to border" across the country's southern belt. The firm provides service to 35,000 mobile customers, and plans to expand its coverage soon in

[8] Source: Coverage Area-GSM World's Website

a semi-circular band around Lake Kyoga to such Districts as Pallisa, Soroti, Lira, Masindi and Gulu. Figure 3.1.3 shows Celtel's mobile coverage in Uganda as of end of 2001

FIGURE 3.1.3 – CELTEL MOBILE COVERAGE[9]



Within these areas, Celtel offers community payphones (known as "Celtel SIMU") and provides its mobile customers the choice of pre- and post-payment options and valued-added services including SMS and voice mail. As with the other operators, Celtel's customer base is mostly pre-paid (though slightly less in percentage terms than MTN). Celtel's original 1993 license required it to contract with UTL and/or MTN for international gateway access. Following a dispute among the firms over the appropriate charges for access, Celtel's license was revised last year to allow the firm to establish a gateway for its own traffic (but not to offer the service to others on a commercial basis) or to contract for gateway access with providers outside Uganda.

[9] Source: Coverage Area-GSM World's Website

3.2 Internet Service Providers

3.2.1 Dial-up Internet Access

There are currently 17 licensed Internet service providers (ISPs) serving approximately 5,000 dial-up and 1,500 wireless Internet / e-mail subscribers. The market leader - with over 70% of the current ISP market share – is Infocom. In addition to Kampala, the firm has a point of presence (POP) in Jinja for local dial-up Internet access and plans to provide this year a similar service in Masaka, Mbale and Mbarara. Other large ISPs in Uganda are Africa Online Uganda and UTL Online (discussed above).

3.2.2 Dedicated Connections

Dedicated connections are provided primarily in Kampala through leased lines that include both fiber optic and wireless transmission. For example, MTN's high speed fixed wireless services (64 kbps and 128 kbps) are available in Kampala using frequency hopping spread spectrum technologies. This service is being used by individual customers and to create virtual private networks (VPNs) for large businesses with several office locations within Kampala. Where fiber optic transmission is available, MTN can provide corporate customers with tailored data services.

3.2.3 VSAT

There are 8 VSAT international data gateways licensed to provide Internet / e-mail services in Uganda as of January 2002, the largest of which is Afsat Communications. Afsat has 85 VSAT customers, all of whom are private businesses and NGOs in Uganda. Afsat is also the technology provider for the Schoolnet Uganda program.

3.3 Providers of Value-Added Services

As the Ugandan telecommunications sector develops and matures, several different types of "middlemen" have arose to facilitate the delivery of, and add value to, the core services provided by the main operators. These are the distributors, marketers, franchisees, etc. that all play a role in "extending" services beyond the reach of the operator's networks. These are important and exciting areas of entrepreneurial activity.

3.3.1 Phone Providers

Because it is often not economical, particularly in rural areas, for residential users to own their own phones, a wide variety of phone providers have arisen in Uganda. The primary categories are as follows:

- ***Phone Stores:*** These are distribution outlets for the major operators in Uganda, most often operated through franchise agreements. Regional franchises have been awarded to independent distribution agents; and an active resale market has sometimes developed for the franchise rights, with a primary agent selling to local distribution agents. Simba Communications is the main franchisee for MTN; Extel, Telechoice and Caltex (which owns and operates petrol stations throughout the country) are the main franchisees for UTL/Mango; and Total (also an owner and operator of petrol stations) is the main franchisee for Celtel. Some phone stores are maintained and staffed directly by the major operators.

- ***Phone Shops:*** These are small commercial enterprises run by individuals unaffiliated with large operators. The service of phone provision is often an add-on to a core business, such as a grocery store.[10]

- ***Street Vendors:*** These even smaller commercial enterprises – just an individual with a phone (or several phones) and, literally, no overhead. Different rates are usually charged to customers depending on which network (UTL, MTN or Celtel) they wish to call to. There are many street vendors in Uganda, estimated between 6,000-7,000. While present throughout the country, they appear to be especially active in peri-urban areas.

3.3.2 Resellers of Pre-Paid Phone Cards

In addition to franchised Phone Stores distributing pre-paid cards, there are thousands of re-sellers of these pre-paid phone cards all over Uganda. These sellers, which generally offer the cards along with other (non-telecommunications) goods and services, are prevalent in rural

[10] Sometimes the phone provision service is all that's offered, and sometimes it is "bundled" in creative ways. On one of its field trips, the consulting team met a particularly enterprising (mobile cellular) phone shop operator that was able to establish and maintain his business in an area with a generally weak network signal only after identifying a small spot in an open field where the signal came through clearly. While this operator might not think of things in quite these terms, his bundled service includes (at least for first-time customers) not only provision of the phone but also an escort to the right spot.

trading centers. The operators have generally encouraged the development of this sort of alternative distribution channel. Cards are often provided to these retailers on credit.

3.3.3 Cyber Cafés (Computer Providers)

The figures in Section 4.2 present an incomplete picture of Internet / e-mail use in Uganda. The International Telecommunication Union (ITU) estimates 40,000 users, a number significantly higher than total individual subscribers (6,500). Because most Ugandans cannot afford their own personal computers,[11] cyber cafés have begun to proliferate, but so far only in the two major urban centers of the country - Kampala and Jinja. There are currently 31 licensed cyber cafés in these areas (although several of these are closed or not operational).

3.3.4 Telecenters

These are communication centers, normally set up in rural areas with external donor or NGO funding, combining the services of phone and computer provider. In larger areas, library and other educational services are often also provided. These institutions generally provide these services as part of a broader program of economic development and empowerment. Examples include:

- Nakaseke, Luwero District (ITU, IDRC and UNECSO-funded);
- Nabweru (IDRC-funded);
- Buwama, Mpigi District (IDRC-funded); and
- Kamuli District (Uganda Development Services).

3.3.5 Vanguard Institutions

This is a term used in the Rural Communication Development Policy of 2001 to denote organizations establishing (through donor funding) pilot programs for computer provision and Internet access, usually in rural areas. The most common examples are schools and hospitals. Because of their remote locations, many vanguard institutions are being outfitted with VSAT systems.

3.3.6 Consultants

While they might not refer to themselves in these terms, there are several companies – primarily (perhaps exclusively) in the urban centers – that provide the traditional consulting services of offering advice and information on how to best employ – and extend the capabilities of – available telecommunications products. Examples include Uganda Online and Computer Frontiers International, both based in Kampala.

[11] The ITU (2001) estimates there were only 60,000 PCs in Uganda in 2000.

SECTION IV – POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

4.1 Legal Framework

The legal foundation for the changes throughout the past decade within the Ugandan telecommunications sector is composed of two core components – the Telecommunications Sector Policy Statement of 1996 and the Communications Act of 1997. The former stated what was to be done (including sector liberalization, privatization and regulation), and the latter provided detail on how to do it.

The two laws are summarized in Appendix C.

4.2 Institutional Framework

4.2.1 Ministerial and Cabinet

Ministry of Works, Transport, and Communication

The Ministry of Works, Transport and Communications (MoWTC) retains primary responsibility within the Government for developing telecommunications policy. Its core strategic objective in this regard is to "promote an efficient and effective communication system" in Uganda. The Ministry contributed to the development of the Policy Statement and the Communications Act discussed above, played the lead role in bringing Celtel to the sector; and supported the tendering for MTN or UTL. The MoWTC issues licenses to the major telecommunications operators.

Ministry of Finance, Planning and Economic Development

The Ministry of Finance, Planning and Economic Development (MoFPED) is responsible for managing public finances, ensuring effective public spending and overseeing the planning and implementation of national strategic development initiatives. These general "powers of the purse" provide the basis for this Ministry to impact the telecommunications in many different ways.

The most direct areas of interaction with the telecommunications sector are as follows:

- providing funding to the Uganda Communications Commission, the industry regulator, and other government agencies active in the industry;
- developing industry policy frameworks and programs, often in consultation with donor agencies;
- serving as the head Ministry with ultimate responsibility for all forms of privatization within the industry.

The MoFPED formally retains the shares in state-owned limited liability companies (and thereby "owns" the 49 percent of UTL that was not privatized).

Divestiture Reform Implementation Committee and Privatization Unit

The Divestiture Reform Implementation Committee (DRIC) is a cabinet sub-committee with overall responsibility for the implementation of public enterprise reform and divestiture. The DRIC is chaired by the MoFPED and includes the MoWTC as a member. It serves as the Board of Directors for the Privatization Unit, which is organized within the Ministry of Finance and retains lead responsibility for administering the reform and the privatization of major state enterprises.[12]

The Privatization Unit played a key role in the unbundling of UPTC (1997), the tendering for MTN (1998) and the sale of the majority stake of UTL (2000). The Unit is presently attempting to administer a sale of the Government's minority stake in UTL through a local stock market.

While the Privatization Unit has never retained any formal role as a regulator, it did in fact conduct a variety of regulatory functions in the early stages of the industry reform program. This occurred during the period when the UCC had just recently been established and was working to recognize its authority and establish its credibility. In its determination to successfully attract private investment, the Privatization Unit established essentially a "one-stop shop" for both bidders and successful investors to express their concerns. The impact of the Privatization Unit has not been limited to procedural matters. Provisions of the successful bid for the SNO administered by the Unit were established as licensing conditions for MTN (and thereby memorialized as industry policy).

The Privatization Unit played an important role in the establishment of the industry regulatory. However, even after the regulator began functioning, the Privatization Unit continued to serve as a "sounding board" for industry players, while continuing to "respect the independence of the regulator." While this was an unusual – and not generally advisable – arrangement, it does not appear to have created significant problems. The Privatization Unit appears to now be mostly withdrawn from the regulatory process.

4.2.2 Regulatory – Uganda Communications Commission (UCC)

The Uganda Communications Commission (UCC) was established under the Communications Act of 1997. This Act states that the seven members of the Commission are to be appointed by the MoWTC with the approval of Cabinet. The members (except for the Executive Director), several of which must be members of prescribed professional groups, serve staggered three-year terms (the Executive Director serves for five years) and may be reappointed.

The main functions of the UCC, as outlined in the Communications Act, are to:

- set national telecommunication standards and ensure service quality;
- ensure equitable distribution of services throughout the country;
- establish tariff systems to protect consumers;
- promote competition; and
- license and monitor communication services.

[12] With over 100 privatizations completed, the current plan is for the PU is to privatize 40 additional state-owned enterprises by 2005 (*The Kampalan*, 2001).

The UCC has not yet actively addressed all its responsibilities. In particular, no tariff methodology (other than utilizing prices proposed in winning privatization tenders as caps) has been developed, interconnection standards and procedures have not been specified, and monitoring and enforcement is weak.

The UCC has thus far focused the bulk of its attention on licensing. Given the general status of the license – within any regulatory regime – as the foundational regulatory document (effectively establishing the legal basis for an agency to regulate), this is a sensible use of scarce resources. It is a particularly sensible approach in Uganda because, as discussed further below, the licenses have (at least for the major players) been used to document a significant amount of specific industry policy.

The UCC plays a role in decisions regarding two types of licenses:

- For ***major licenses*** – including national and international fixed-line and mobile telephony, trunk capacity release services[13], satellite and third party network services – the UCC provides a recommendation to MoWTC, which retains formal authority;
- For ***minor licenses*** – including Internet access, public Internet cafés, telex services, couriers, public payphones, fax and lease and maintenance of subscriber premise wiring – the UCC retains issuing licenses.

The Commission has thus far issued the following minor licenses:

- 17 Internet Service Providers;
- 19 public payphone operators; and
- 8 VSAT providers; and

The requirements for applying for a UCC license, the manner in which UCC processes license applications and the fees UCC charges for processing various licenses are presented in Appendix D.

The UCC is financed in three ways:

- funds authorized by the MoFPED;
- license (including spectrum) fees; and
- lease income from the UCC's building, the Communications House.

The UCC is not fully independent (relative to generally recognized international standards) from Ministerial control. Most significantly, the MoWTC issues major licenses and retains authority for revising these licenses.

4.2.3 Donors and Non-Government Organizations (NGOs)

Since the mid-1990s, donors and NGOs have been active in Uganda attempting to promote greater use of ICTs, particularly in rural areas. Efforts have mostly focused on funding

[13] Licenses for some forms of postal service also fall within this category.

community-based telecenters. Agencies involved include the World Bank, UNESCO, the Canadian International Development Research Centre (IDRC), DANIDA, Uganda Development Services (UDS) and the ITU.

Schoolnet Uganda is the country's first NGO dedicated to information technology and education. Since 1997, Schoolnet has assisted in the creation of 20 school-based telecenters, and is currently in the process of rolling out its program to 15 rural educational sites. Schoolnet assists its member schools by providing finance, teacher training and various forms of technical and administrative support.

Schoolnet in turn receives financial support from World Links for Development (WorLD), a global learning network funded by the World Bank and the Gates Foundation linking thousands of students and teachers around the world via the Internet. WorLD has recently provided funding for satellite-based connectivity utilizing VSATs, and related training, to several schools.

4.2.4 Quality of Personnel

A striking part of the institutional landscape in Uganda, based on several meetings conducted by the consulting team throughout its mission, is the very high quality of the personnel heading at least some of the organizations discussed above. While we perhaps did not have the opportunity to visit enough organizations to confidently draw general conclusions, and the visits we did conduct did not allow for meeting with supporting staff, the team did get the sense of an impressive level of skill of some of the leaders of the key institutions impacting the telecommunications sector.

In particular, our discussions with

- Hon. Minister Nasasira of the Ministry of Works, Housing and Communications;
- Mr. Michael Opagi, Director of the Privatization Unit; and
- Mr. Patrick Masambu, Executive Director of the Ugandan Communications Commission;

revealed a group of civil servants with a complete command of the subject matter within the scope of their authority, a clear understanding of organizational mission and a polished skill in communication and presentation.

4.3 Policy Framework

4.3.1 Privatization[14]

Privatization has impacted the development of policy for the telecommunications sector in at least two ways. First, and most fundamentally, it appears that, unlike similar privatization programs in developing economies, maximization of privatization proceeds was not specified – either explicitly or implicitly – as a core objective. There appears to have been an enlightened understanding that this lack of attention to short-term proceeds would allow for more flexibility in

[14] The term "privatization" is employed in this section, and it is throughout the entire report, in the broadest sense. It includes any transfer of asset ownership and/or operational control from the Government to the private sector, and also the attraction of private investors to develop Greenfield opportunities.

designing policy, and that this flexibility would result in better policy that, over the long run, would be more valuable than whatever short-term revenues were foregone.

Second, this flexibility allowed the tenders for the SNO and the majority stake in UTL to be very much focused on identifying operators that were willing to invest in, and had effective plans for, system expansion. And as discussed further below, elements of the winning bids – with respect to system expansion and other policy areas - were incorporated directly within the licenses.

4.3.2 Licenses and Service Obligations

Licenses for the major operators in the Ugandan telecommunications sector do more than establish a general foundation for administrative regulation. They have been employed as a mechanism for documenting specific aspects of industry policy, particularly with respect to obligations for investment and system expansion.[15]

Licenses for full telephone service (fixed-line, mobile and international gateway access) have been issued to UTL and MTN. Each license is for a term of twenty years and specifies the following obligations:

- must provide all (basic) telecommunications services;
- must provide full country coverage;
- must meet roll-out targets for rural and urban areas;
- must interconnect with other licensed operators on reasonable commercial terms; and
- must comply with price caps.

Price caps have been specified in the licenses as the figures provided in the winning bids for the SNO and the majority stake in UTL. There has thus far been no additional regulation of prices. Similarly, rollout targets for MTN and UTL have been specified in the licenses as the figures provided in the winning bids.[16]

[15] Several countries over the past few years have adopted a form of regulation often referred to as "contract regulation." The idea is that (some portion of) regulatory policy and company obligations are documented in contract rather than established over time by a regulatory agency in the context of administrative proceedings. The contractual terms are often agreed to at the time ownership and/or operational control of industry assets are transferred from the Government to a private company. The contract is often administered by a government agency other than an independent industry regulator. The approach in Uganda, with a significant amount of policy documented in the license, reflects a combination of the "contract and traditional administrative regulation.

[16] For the SNO, both proposed prices (which would function as price caps) and rollout plans were evaluated as part of the process of selecting the winning bid. For the UTL privatization, proposed prices (which were, as discussed above, eventually incorporated as price caps into the license) were not part of the evaluation.

The obligations of each of the two companies for rolling-out services throughout the first five years of the licenses are displayed in Table 4.3.2.

TABLE 4.3.2 – NATIONAL LICENSE ROLLOUT OBLIGATIONS[17]

Region	MTN Subscriber Lines	MTN Public Payphones	UTL subscriber lines	UTL Public Payphones
Kampala area	48,702	643	10,000	1,000
Central	13,885	437	5,000	500
Eastern	16,122	495	6,000	600
Northern	3,962	129	3,000	300
Western	6,934	296	6,000	600
Total restricted obligations	89,605	2,000	30,000	3,000
Unrestricted obligations	0	0	70,000	0
Total	89,605	2,000	100,000	3,000

While the expectation of policymakers was that these obligations would be met primarily through the provision of fixed-line service, this was not specified in the licenses.

Along with the obligations, the licenses established "exclusivity" provisions for the two companies (except for services provided before the MTN license became effective – in particular, Celtel's mobile service. – which are grandfathered) for a five year period (beginning July 2000, when UTL was licensed). While promoting competition was a core policy objective, the thinking was that, with two national operators competing directly, additional competition could be temporarily forgone for the sake of increasing the attractiveness of the investment opportunities (and obligations).

This quid pro quo quality of the licensing – where competitive advantage is provided in exchange for service (in particular, expansion) obligations – has recently been extended to Celtel. The firm's license was revised to allow for more options for routing its international cellular traffic in exchange for rollout obligations.[18]

Companies are subject to penalties – up to 10 percent of gross revenues - for failure to meet expansion obligations. The UCC also retains the right to suspend the license or revoke it completely under certain conditions.

4.3.3 Rural Communications Development

Development of rural communications has been a part of the telecommunications sector reform program from the beginning. The 1996 Policy Statement emphasized the importance of increasing the geographic coverage of service, and the 1997 Communications Act specified

[17] Shirley, M. Mary, Tusubira, F.F., Grebreab, Frew, and Haggarty, Luke, "Telecommunications Reform in Uganda," pp.28

[18] There are quality of service obligations as well. These obligations require the operators to meet minimum standards on their "protected telephony services" with respect to: (i) local call completion rate, (ii) long distance call completion rate, (iii) international long distance call completion rate, (iv) the fault recovery rate, (v) regional coverage, (vi) digitization of network, and (vii) maximum connection time for subscriber lines in urban areas. For example, by the fifth year, local call completion rates are required to reach 85 percent; network digitalization is required to rise to 95 percent; and maximum time to connect a subscriber in an urban area must be two weeks.

additional steps, including establishment of the Rural Communication Development Fund (RCDF).

The goal of the RCDF is "to support the development of a commercially viable communications infrastructure in rural Uganda in order to promote social, economic and regional equity in the deployment of telephone, Internet and postal services". The Fund is financed by operator contributions of a percent of gross revenues. While the law allows for contributions of up to 2.5%, the MoFPED has currently established the rate at 1 percent. Although all operators are subject to this levy, the UCC, which is responsible for administering the Fund, is presently only collecting from the three major providers.

While the RCDF has not yet played a major role in the industry, this looks set to change. The UCC recently prepared the Rural Communications Development Policy of 2001. This policy highlights the central role of the RCDF in supporting the implementation of policies and strategies for expanding telecommunication services in rural areas.

The general objectives of the Policy are to:

- provide access to basic telecommunication services within reasonable distance to all people;
- effectively utilize the RCDF to leverage investment in developing rural telecommunication services; and
- promote the use of ICT in Uganda through multi-purpose community telecenters.

The Policy specifies the following three specific targets:

- Provision of basic communication services to all sub-counties with at least 5,000 inhabitants by year 2005 (a payphone and postal access for 5,000 people or two payphones in every sub-county);
- The establishment of an Internet Point of Presence in all Districts by 2003; and
- The introduction of ICT in at least one "vanguard" Institution in every District by Year 2003

The UCC intends to achieve the first target partly through the obligations in the licenses of the major operators, but more importantly through the licensing of Independent Area Operators in the areas most difficult to serve.

These areas were identified last year when MTN and UTL were asked by the UCC to specify the sub-counties they did not intend to provide telephone service to by July 2002, and were thereby willing to forfeit their exclusivity rights to serve. There were 154 sub-counties identified by both firms – the so-called "unprotected areas" – and these will be the focus of interventions under the RCDF. The UCC will issue tenders, whereby private operators will compete to provide telephone service on the basis of the minimum required subsidy.

The World Bank estimates that achieving the three specific targets by 2005 will require a total subsidy of US$5.8 million. The components of this subsidy are displayed in Table 4.3.3.

TABLE 4.3.3 – ESTIMATED COSTS AND SUBSIDIES

	No. of sites (#)	Unit cost (US$)	Total investment (US$m)	Total subsidy (US$m)
Universal access to voice telephony	154 sub-counties		9.0	4.5
* Global coverage	98 sub-counties	83,000	8.1	-
* Point coverage	58 sub-counties	15,000	0.9	-
Internet access at District HQ	30 Districts	50,000	1.5	0.8
Rollout of rural MCTs	7 Districts	70,000	0.5	0.5
Total			**12.0**	**5.8**

Assumptions.: (a) Two thirds of sub-counties would receive point coverage (e.g. VSAT) and one third would receive global coverage (e.g. GSM). (b) One GSM base station costs $250,000 and serves 3 sub-counties. (c) One VSAT station costs $15,000 plus a hub of $1,000,000. (d) One $ of subsidy is required for every $ of private investment in ICT infrastructure.

The RCDF currently has a balance of approximately US$0.7 million. Based on continued 5% annual GDP growth rates and an assumption that the ICT sector will gradually increase its share of GDP, projected annual revenues for the RCDF are between US$1-2 million. Because this will not provide sufficient funding to meet the established targets before 2005, the World Bank will provide seed financing for the Fund.

4.3.4 Information and Communications Technology (ICT) Development

The Uganda National Council for Science and Technology (UNCST) has recently prepared the "National Information and Communication Technology Policy Framework for Uganda." Its primary message is that Uganda's recent economic growth and the effectiveness of its public and private institutions have been "dependent on the adoption and effective utilization of ICTs." The report notes however, that there has been a significant divide between urban and rural use of ICTs and access to the supporting infrastructure.

Although the Policy is still in draft form, has not yet been approved by the Government, and does not offer very specific action steps, it does emphasize the need for national-level policy attention to the importance of rural access to other telecommunications services in addition to telephone.

4.3.5 Rural Electrification

The Ministry of Energy and Mineral Development (MEMD) intends to increase the level of rural electrification to 4% by 2005. Plans are being developed and implemented within the World Bank-sponsored "Energy for Rural Transformation (ERT)" project in Uganda. The ERT project contains a significant ICT component. It recognizes the connection (discussed further below) between electricity and telecom service provision in rural areas. The ERT project will, in a manner similar to the recent liberalization of the Uganda telecom sector, be driven by private sector provision of infrastructure and services, and supported by a Rural Electrification Fund.

SECTION V – MARKET DYNAMICS

The two previous sections have introduced sector participants and described the supporting public-sector environment. This section now focuses directly on the markets for telecommunications service; the places where business relationships (connections) are established, prices are set and transactions are conducted.

For ease of exposition, the following discussion of the telecommunications sector is organized into telephone and data services. Before proceeding to describe the dynamics of these "markets," we first take some steps toward defining our primary market of interest – i.e. the rural one. As we'll see, in Uganda, a clear definition is elusive.

This section concludes with a brief discussion of linkages between the telecommunication and electricity sectors.

The market for data services – which has mostly not extended beyond the major cities into rural areas – is described in Appendix E.

5.1 Growth in connections

Growth rates for telephone subscriptions and teledensity throughout the past seven years are displayed in Table 5.1. The growth has been dramatic, driven primarily by expansion of mobile service.

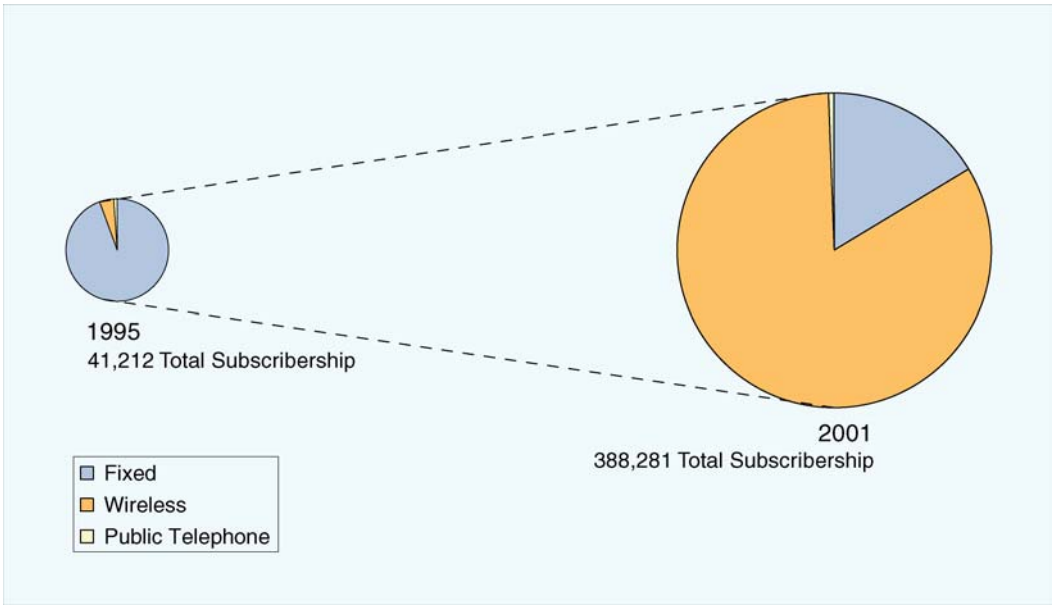
TABLE 5.1 - TELEPHONE SUBSCRIBERSHIP IN UGANDA [19]

Services	1995	1996	1997	1998	1999	2000	2001
Fixed	38,972	44,610	49,271	54,091	57,200	61,700	63,700
Mobile	1,747	4,000	5,000	12,500	56,400	188,600	322,700
Public	493	908	1,092	1,258	1,433	1,642	1,881
Total	41,212	49,518	55,363	67,849	115,033	251,942	388,281
Teledensity	0.21	0.26	0.29	0.41	0.53	1.13	2.0(e)

Figure 5.1 visually highlights both the substantial increase in the size of the market throughout the period as well as the shift over time from reliance on fixed-line to reliance on mobile service.

[19] Op. cit., Shirley, pp. 53 and ITU website

FIGURE 5.1 – TELEPHONE SUBSCRIBERSHIP IN UGANDA



Shares of mobile service by company are displayed in Table 5.2.

TABLE 5.2 – MARKET SHARES OF MOBILE SERVICES

Middle of 1999		
Company	Subscribers	Market Share
MTN	36,500	64.60%
UTL	0	0.00%
Celtel	20,000	35.40%

Feb 2002		
Company	Subscribers	Market Share
MTN	230,000	64.79%
UTL	75,000	21.13%
Celtel	50,000	14.08%

Fixed-line service continues to be dominated by UTL, which controls over 97% of the market.

The most attractive commercial opportunities have likely been pursued. While it is inevitable that the rate of growth will slow, it will not stop. Three key factors will continue to drive expansion of the system:

- ***Competition and Improved Technology:*** The dynamic of competition remains a powerful (and often underestimated) force. A variety of factors from financial imperatives to professional pride drive company managers in a way that seems impossible to replicate in a monopoly environment. While MTN appears to have lost a bit of the edge in aggressive posture, Celtel and UTL appear to have picked up the slack in this regard.[20] Indeed, Celtel

[20] This observation is based on the consulting team's interviews with management teams for each of the three companies. There is a noticeable difference in the way the different firms' managers describe their perception of opportunities. MTN appears mostly satisfied with its progress thus far, while the others seem more anxious to break into new markets. This is not at all an unusual competitive dynamic for a group of firms with their relative market shares.

managers speak with great confidence about an improved GSM product for extending into more remote and less densely populated areas..

- ***Licensing obligations:*** Both MTN and UTL must complete their rollout obligations (although much has already been fulfilled). Celtel, as part of the recent revision of its license, has also become obligated in this regard. Although the UCC is meant to assess compliance on an annual basis, it has not yet begun an active monitoring program. Operators may have thereby been provided a grace period on the enforcement of compliance with some of the detailed provisions of their obligations. As the UCC becomes more vigilant in its monitoring and enforcement, firms may become more motivated to identify additional opportunities.
- ***RCDF funding:*** The RCDF is scheduled to begin disbursements in 2003. These funds will of course help to turn marginally unattractive sites into financially viable service areas.[21]

5.2 The Impact of Technology

The expectation of policymakers throughout the industry reform program was that fixed-line service would be employed to meet a significant portion of the rollout obligations. As the figures presented above reveal, the reality has been different from the expectation. The reason for this is simple. GSM technology is ideally suited for the demographics of at least certain parts of Uganda (where, even within predominantly rural areas, populations are fairly even dispersed – rather than consistently concentrated in isolated pockets – and the prevalence of agriculture within the country's economy means that there is commerce, and therefore reasonable income levels, in some outlying areas).[22] Even for UTL, which already has in place a fixed-line network (with all associated costs fully "sunk"), it appears that, because of the level of degradation of the existing network and ongoing concerns about security, GSM has mostly offered (particularly in rural areas) the superior value proposition for rapid rural expansion, at least in the short term.[23]

It is, on one hand, not at all a problem that private operators have employed a technology different from the one contemplated by policymakers. By not imposing their preference on operators through the licensing provisions, Ugandan policymakers (perhaps inadvertently) employed a strategy that most regulatory economists most often prescribe – i.e. focusing on outputs (the provision) of service rather than inputs (the methods employed to provide service). Many economists would also take comfort from the fact that the market's preference seems to have fairly revealed itself.

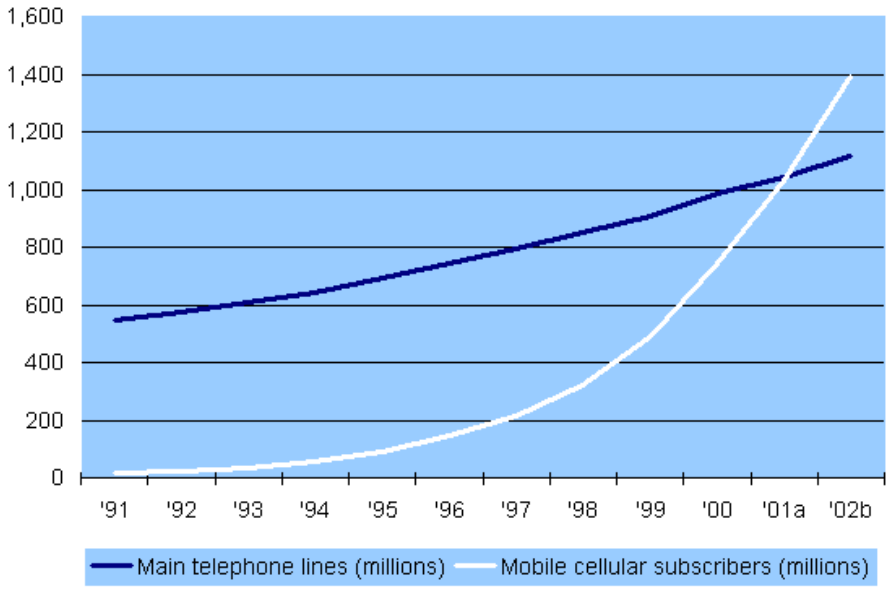
Indeed, the market's recently revealed preference for mobile versus fixed-line service in Uganda is perfectly consistent with international trends, as displayed in Figure 5.2.

[21] The RCDF Report recommends three types of disbursements for telephone service (i) open tender for public projects, with potential total subsidy amounts in excess of US$ 1 million, and with associated operating licenses; (ii) direct disbursement to applicants seeking amounts less than $15,000 (for small projects such as pilot telecenters); and (iii) simplified direct disbursement to applicants seeking support for 'rural packages' (each grant less than $1,000) to enhance signal reception and solar power supply for public telephony kiosks or telecenters.

[22] MTN claims that the per-user cost of a fixed wireless network is several times that of a GSM based network.

[23] Over the longer term, marrying WLL technologies to existing transmission towers, as MTN is planning, may prove optimal for rural areas.

FIGURE 5.2 – BREAKDOWN BETWEEN MOBILE AND FIXED SERVICES—WORLD WIDE[24]



Ugandan policymakers still retain their preference for a more substantial fixed-line rollout (WLL and terrestrial) because they understand this architecture to provide a stronger platform for the layering on of additional ICT applications.[25] This concern is exacerbated by two additional considerations. First, as discussed above, Government policy is moving towards a focus on promoting ICT applications. Second, as discussed below, there has not yet been any significant penetration of these applications outside the major cities.

This policy concern provides the subtext for a more practical consideration. Rollout obligations in the licenses specify only numbers of subscriber lines. Because there is ambiguity about how such subscriber lines should be defined relative to mobile service, it is not clear how company performance relative to obligations should be assessed. This remains an open issue.

5.3 Demand for Service in Rural Areas

Levels of demand for telephone service outside the city centers in Uganda have revealed themselves to be much higher than expected. Company planning models have systematically under-estimated rural demand. This situation is not unique to Uganda. Planning models are usually based not on detailed market research surveys of potential rural users, but rather on existing "official" income and tax statistics. This data does not generally reflect the realities of rural areas where real income levels are bolstered by gray market activities and remittance payments from family members living in urban areas or abroad.

[24] Source: ITU Website

[25] This concern does not extend to all areas where mobile networks have expanded. Mobile service can be employed as either a substitute for or a complement to fixed-line service. In industrialized economies, the relationship is primarily (but not exclusively) complementary. In Uganda, as in most developing countries, the opposite is true. In this environment, the mobile network predominantly displaced the fixed-line network.

There is increasing recognition among rural telecommunication specialists of the importance of remittance economies in predicting demand.[26] Remittances to rural family members in developing countries often include the provision of hard consumer goods (televisions, cookers, etc.). Where telecommunication services exist, it is becoming quite common for urban family members to provide relatives with a fixed-line telephone or mobile phone, and to pay the service costs.

Official statistics often do not reflect the realities of wealth in rural areas, especially agriculture-based economies. The accumulation of capital takes on very different forms in such areas, particularly where, as in Uganda, livestock production is prevalent. Cattle and water buffalo, for example, serve as much more than a supply of dairy products and meat – they represent significant assets. A seemingly poor farm family may actually have a net worth of several thousand dollars if they are able to maintain a small herd of healthy cattle or goats. Livestock are commonly leveraged for small loans from local moneylenders.

The Ugandan agriculture-based economy leads to a significant amount of commerce in rural areas. As in other developing countries where telephones are available, agricultural producers have quickly adopted their use for gaining information on market prices, negotiating better prices from a more diverse range of input suppliers and buyers, gaining information on market trends, and accessing agricultural extension information. Input suppliers, buyers and transportation services make significant use of rural telephones to improve efficiencies, and lower warehousing costs by being able to more accurately respond to producer demand and commodity market swings.

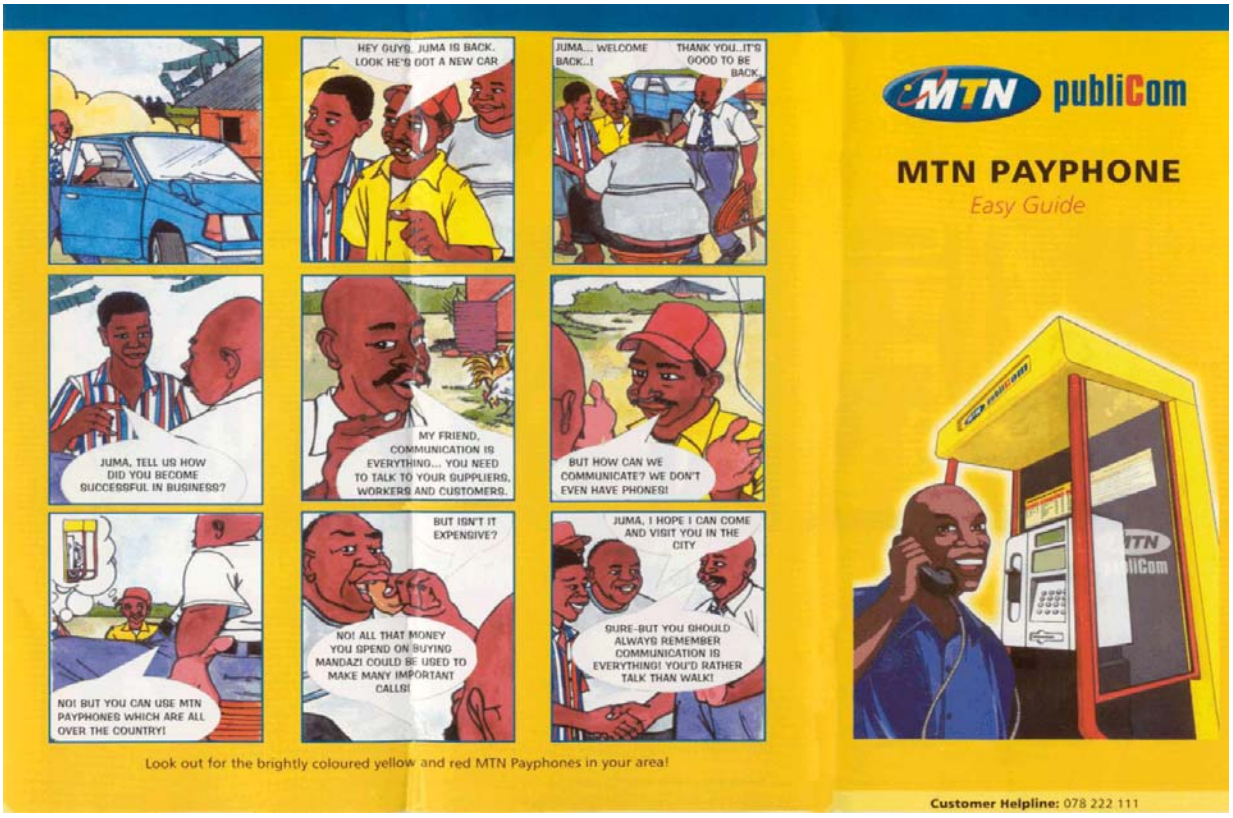
There is evidence that, in rural areas, consumer willingness to pay for telephone service, measured as a percentage of income, is very high. According to the final report submitted to the UCC on policies and strategies for rural communications in Uganda, rural customers in some areas claim to be willing to devote as much as 25 percent of their income to telephone service[27] This is significantly higher than industrialized countries.

Whatever the existing levels of demand and willingness to pay, there appears to exist a significant component of consumer demand that is latent and supply-driven. In communities where residents have had little experience with any advanced form of communications technology, there is great potential to substantially increase demand levels through various forms of awareness programs such as education (which has been conducted by the Ugandan government, often in conjunction with donor agencies and NGOs) and advertisement (by private operators). One example of the latter, for MTN Publicom payphone service, is displayed in Figure 5.3.

[26] See, for example, TeleCommons Development Group's study of Grameen Telecom in Bangladesh.

[27] Report by Intelecon, 1 March 2001, pp. 39-40. Some people with monthly incomes of approximately Ush 90,000/mo have indicated a willingness to spend Ush 20-25,000/mo for monthly fees and call charges. Because the income figure is based on official data, the percentage figure may be overestimated. Even allowing for this, a willingness to pay estimate for telecommunications services anywhere close to 25% of income is far greater than 2-3% observed in developed countries.

FIGURE 5.3 – MTN PUBLICOM PAYPHONE ADVERTISEMENT



Service providers can stimulate demand not just through advertising, but also by adjusting product attributes. Operators in Uganda have recently experimented with, and received favorable reactions to, the introduction of lower denominated pre-paid cards for mobile services and public phones and reduced monthly service fees. The former reduces the amount of cash required by potential customers, and the latter shifts charges away from the sorts of fixed fees that many customers resent because they are independent of usage.

5.4 Retail Pricing and Pricing Power

Prices charged by the three major operators in 2001 are displayed in Table 5.3.

TABLE 5.3 – TELECOMMUNICATIONS TARIFF IN 2001[28]

US$ (per traffic minute)	April 2001				
	UTL^F	UTL^M	Celtel	MTN^F	MTN^M
Local Calls					
Calls from UTL^F	0.04	0.12	0.14	0.14	0.14
Calls from UTL^M	0.12	0.12	0.17	0.14	0.14
Calls from Celtel	0.18	n/a	0.18	0.18	0.18
Calls from MTN^F	0.07	0.17	0.17	0.07	0.09
Calls from MTN^M	0.14	n/a	0.18	0.12	0.12
Domestic Long Distance Calls					
Calls from UTL^F	0.14	0.12	0.14	0.14	0.14
Calls from UTL^M	0.12	0.12	0.17	0.14	0.14
Calls from Celtel	0.18	n/a	0.18	0.18	0.18
Calls from MTN^F	0.14	0.17	0.17	0.12	0.12
Calls from MTN^M	0.14	n/a	0.18	0.12	0.12
International Calls					
US	1.11	0.78	1.46	0.83	0.83
UK	1.00	0.72	1.46	0.78	0.78
India	1.14	1.00	1.46	1.03	1.03
Rest of Africa	0.83	1.06	1.46	1.08	1.08
East Africa	0.36	0.36	0.88	0.33	0.39
Connection Charges	n/a	22	24	256	25
Monthly Subscription Charges	n/a	19	21	Basic =8.33 ISDN = 16.67	19

Notes:
F = Fixed
M = Mobile

While there is substantial variability in pricing across the companies, some general patterns emerge.

- For both MTN and UTL, cost per minute for local and domestic (long-distance) calls are on average higher for use of the mobile than the fixed-line network. That said, the difference is, particularly for MTN, not large.[29]
- There are significant differences in connection and monthly subscription charges for use of the MTN mobile and fixed-line networks.. The pattern of these differences – i.e., higher connection but lower monthly charges for the fixed network – make clear that the relative costs of the two services depends on how long the customer expects to remain connected.
- Local and domestic prices for UTL and MTN (for both fixed-line and mobile) are similar. For international, UTL is cheaper for mobile service and MTN is cheaper for fixed-line service.
- Celtel prices are a bit higher than the other two major operators for local and domestic calls, and significantly higher for international calls.[30]

[28] Op. cit., Shirley, p. 57

[29] But this is likely to change as MTN expands its WLL fixed-line services.

These prices are mostly unregulated. They are constrained (in addition to the factors discussed below) only by price caps in the license. These caps were determined not through a process of regulatory review, but rather were specified in the winning bids for the licenses.

The companies have mostly priced below the allowed caps. It is clear that forces other than regulatory control are constraining prices. There are two such forces – competition for supply and demand elasticity.

5.4.1 Competition for Supply

Mobile telephony has become the dominant form of service and there are three active competitors. Although MTN currently controls a majority of the market, there is no evidence that it's been able to exercise any sort of market power. Indeed, Celtel prices higher than MTN, indicating that competition is focused not only on price, but rather extends to broader forms of product differentiation (with Celtel attempting to sell a service it perceives of higher quality at a higher price). The major operators advertise aggressively and innovate with respect to factors such as bundling and payment options.

While the market for fixed-line service is, with just two providers, less structurally competitive, this makes little difference because mobile service competes directly with fixed-line service in Uganda.

Even with substantial connection fees, customer loyalty to specific companies has been weak. Customers have generally been willing to switch providers quickly if they become unsatisfied with service or are presented with attractive new promotions. This is at least partly due to the fact that all mobile operators use the same type of GSM handsets, reducing customer switching costs.[31]

5.4.2 Elasticity of Demand

Customer price sensitivity is often overlooked as a constraint on market power. In fact, it can be extremely important, particularly in rural markets.

Because rural customers tend to have lower incomes than urban customers (so that a given price increase has a proportionately larger impact in reducing purchasing power), and because they have generally have had more experience living without service (and are thereby better equipped to do without), they are likely, on average to display larger price elasticities (i.e. large reductions in demand in response to price increases) than urban customers. This expectation is supported by the experience of the three major operators in Uganda. Each reported that customers in areas receiving new service have been very sensitive to increases beyond particular price points.

[30] This difference in international rates is a function of Celtel's lack of international gateway license; this regulatory issue is discussed below.

[31] In some countries – including the United States - a consumer wanting to change service providers may have to replace the handset.

5.5 The Intersection of Markets and Public Policy

This section presents a brief discussion of key regulatory and policy issues that should be addressed to ensure the continued development of the industry.

- **Interconnection**

The UCC is responsible for regulating interconnection. While the default interconnection agreement calls for providers to pay interconnection charges to other companies for originating and terminating calls, current agreements provide only for compensation for terminating calls. Customers pay only their own carrier. The UCC is preparing to develop policies for cost-based pricing.[32]

The UCC has thus far mostly left operators to settle disputes bilaterally, intervening only when necessary. Given the administrative expense of regulatory cost-of-service studies, there are advantages to this approach. However, the lack of a general policy framework for determining interconnection costs has likely made it more difficult for companies to agree to terms. Agreements have been reached slowly and with difficulty, particularly when there is an imbalance of network activity (and power in the market).[33]

- **Compliance with the Rollout Obligations**

Rollout obligations for UTL and MTN are expressed in terms of subscriber lines. While Ugandan policy makers assumed that most of the rollout would be achieved through expansion of fixed lines, the licenses were not specific in this regard. Related to but separate from the broad policy dilemma (discussed above) of whether mobile technology provides an adequate backbone for the layering on of additional ICT services, there is the practical problem of determining how the term "subscriber lines" should be interpreted in the context of mobile service.

The UCC has agreed with the operators that there will be an annual review of the rollout compliance but has not determined the criteria on which the review will be based. The UCC is considering a method to assign varying credits to different types of service based on factors such as service quality. The handling of this issue will be of great concern to operators.

- **Airtime tax**

In August 2001, Parliament approved legislation to impose a 7% tax on airtime billings of the three mobile operators. This will generally slow the expansion of the networks and, in particular, will make it more difficult for the operators to meet their remaining rollout obligations.

- **UCC monitoring, enforcement and reporting**

An effective regulator must not only establish effective policies, but also must ensure compliance and provide information to industry stakeholders. While the UCC has not been

[32] OECD countries have generally adopted cost-based interconnection price standards, and developing countries are increasingly adopting similar practices.

[33] For example, a recent MTN/UTL interconnection agreement required six months of negotiation. Also, UTL and MTN are currently engaging in a lingering dispute on this issue.

afforded the level of independence generally recommended by international observers, it has been clearly authorized to monitor compliance, impose penalties and collect and disseminate information.

The UCC has not yet begun actively monitoring the compliance of UTL and MTN with the terms of the rollout provisions in their licenses on an annual basis (and has therefore not imposed, or even determined the need for, penalties). Also, although all companies providing service in the industry are meat to contribute 1% of revenue to the RCDF, the UCC has thus far collected only from UTL, MTN, and Celtel. It has not yet imposed the levy on other sector participants such as the ISPs and TV stations. Also, the agency is not yet, on a regular basis, collecting information on industry performance and making it available to the general public. Lack of staff and resources has made it difficult to fulfill these sorts of obligations.

5.6 The Link Between Rural Telecommunications and Rural Electrification

The link between telecommunications and electrification is manifest in the fact that telecommunications facilities are powered by electricity. In this regard, telecommunications is dependent on electrification. This dependency has created a bottleneck in the expansion of telecommunications service in rural Uganda, where less than 2% of households receive electricity. All the major operators (including MTN Publicom, the subsidiary of MTN responsible for payphone service) identified lack of electricity as a great challenge in meeting rollout obligations.

The operators are often forced to use photovoltaic (solar) cells or diesel generators for power. MTN Publicom, for example, currently has 55 public phone booths powered by photovoltaic cells in areas where the telecommunications network is strong, but electricity is not distributed (e.g., in Kalangala on Ssese Island). Even where distribution lines are available to deliver power from (larger and more efficient) generators owned by others, most of the base stations and telephone exchanges rely on back-up (operator-owned) generators as protection against frequent power cuts. Use of small-scale generators – as either the primary or backup source of electricity – is very expensive. The result is that expansion into areas that would otherwise (i.e. if distributed electricity were available) be marginally commercially attractive is not undertaken.

With electricity demand growing in Uganda at a rate of 7-8% per annum and a national electricity deficit estimated to grow to 780 MW by 2020, donor agencies are working extensively with the Government to reform the electricity sector. But while there has been significant progress in the urban areas, little has been done to improve electrification in off-grid, rural areas. Recently, the World Bank has sponsored the Energy for Rural Transformation (ERT) project to “develop Uganda’s rural energy sector so that it makes a due contribution to the quality of life of rural households and the productivity of rural enterprises.” The goal is to increase rural coverage to 10% of households by 2010.

The ERT project appears to recognize the linkage between rural electrification and telecommunications. Several ICT interventions in rural areas - totaling USD12.5 million - are included in the program, with the following objectives:

- accelerated access to voice telephony;

- Internet access at District Headquarters; and
- telecenters at "vanguard institutions" (including schools and hospitals, as well as associations of farmers and micro-entrepreneurs) outside District Headquarters.

Private operators will bid for the right to undertake projects in "commercially nonviable" areas and receive subsidies from the Rural Electrification Fund. This approach closely parallels the rural telecommunications strategy (propelled by the RCDF). The UCC, the administrator of the RCDF, is also responsible for administering the ICT component of the ERT. This appears, at least in its conception, to be a very nice – and very recent – recognition of, and attempt to exploit, the cross-sectoral linkage.

SECTION VI – PERFORMANCE ASSESSMENT

6.1 Extending Access to New Customers

6.1.1 Expansion Outside the City Centers

In 1995 – the year Celtel began providing service - there were less than 40,000 telephone lines in Uganda. These were all fixed-line, mostly concentrated in the major cities of Kampala, Entebbe, and Jinja (with a small number of lines in smaller urban areas). Uganda was ranked as one of the least developed countries in the world in terms of telecommunication service. There are currently more than 400,000 (fixed and mobile) subscribers throughout many areas in the southern and central parts of the country.

And this 10-fold increase in subscriber levels significantly understates the increase in customer access and usage. The introduction to the sector of large numbers of value-added providers (particularly, in this context payphones and providers of phones, such as phone stores, phone shops, street vendors, telecenters, etc.) has had a profound impact in extending service to a portion of the community that, even with access to a network, would otherwise be forced to do without (because of an inability to pay the upfront equipment and connection costs). MTN Publicom, for example, has since 1999 added over 2,300 public payphones.

The aggressive system expansion has, not surprisingly, been fueled by equally aggressive capital expenditure. According to ITU, average annual capital expenditure in the period 1995-1998 (when Celtel had entered the market, but before MTN became active) was more than twice the average of the preceding four years. In 1999, when MTN had become a substantial player, the level of investment was more than three times the average throughout 1995-1998. This reflects MTN's substantial investment in its new mobile infrastructure. As displayed in Table 6.1.1a, industry has attracted significant amounts of foreign direct investment.[34]

TABLE 6.1.1a – INVESTMENT IN TELECOMMUNICATIONS INFRASTRUCTURE[35]

Category/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Telecommunications Investment (USh Billions)	3	11.6	14.2	11.8	9.2	22.4	30.4	26.6	22.3	80.3	100(e)	120(e)
Telecommunications Investment (US$ Millions)	1.7	6.4	7.9	6.6	5.1	12.4	16.9	14.8	12.4	44.6	55.5(e)	66.6(e)

Note:
US$ 1 = USh 1,800

According to information received from MTN, the company's capital expenditure since 1999 has been more than double what was planned. By March 2001, total capital expenditure since its

[34] The 2000-2001 figures are estimated based on MTN's 27 August 2001 Information Memorandum and historical investment figures for the major operators.

[35] Source: ITU, Econ One Research, Inc.

inception in April of 1998 was a little over 120,000 million Ush.[36] These investments, which have been in both urban centers and more remote rural areas, include expansion of the high-speed, fiber optic backbone linking the three major cities.

UTL has accelerated its investment program since its privatization in June 2000. The increased investments by UTL began in earnest in the year 2001. Celtel also recently accelerated its investment spending. In 1999, it invested $6.3 million in new capital; the corresponding figure for 2000 was nearly $12 million.

The net effect of the capital expenditure and system expansion has been, as displayed in the following table, a pronounced increase in teledensity as measured by number of phone lines (fixed or mobile) per 100 people. As displayed in Table 6.1.1b, since 1993, the growth rate in teledensity in Uganda has been significantly higher than that of Sub Saharan countries.

TABLE 6.1.1b – GROWTH IN TELE-DENSITY IN UGANDA AND SSA COUNTRIES 1991-2000[37]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
SSA*	0.38	0.39	0.4	0.42	0.44	0.47	0.52	0.58	0.69	0.86	1.2	n/a
Uganda	0.17	0.17	0.17	0.11	0.16	0.21	0.26	0.29	0.41	0.53	1.13	2.0(e)
SSA Annual growth%	-	3%	3%	5%	5%	7%	11%	12%	19%	25%	40%	n/a
Uganda Annual growth%	-	0%	0%	-35%	45%	31%	24%	12%	41%	29%	113%	77%

*Excluding South Africa

6.1.2 Extension to the Most Difficult Rural Areas

The success of the telephone expansion program throughout the country (i.e., outside the urban areas) is clear. If one applies a traditional international standard for defining "rural," then almost all of the expansion described above has indeed been in rural areas. However, some areas within Uganda are significantly "more rural" – i.e., more difficult to serve – than others. With reference to two key factors – population densities and income levels – it is clear that the most rural areas in Uganda (i.e. those characterized by the lowest population densities and income levels) are throughout the northern region and within the areas (in the central and southern regions) surrounding, but still remote from, secondary towns

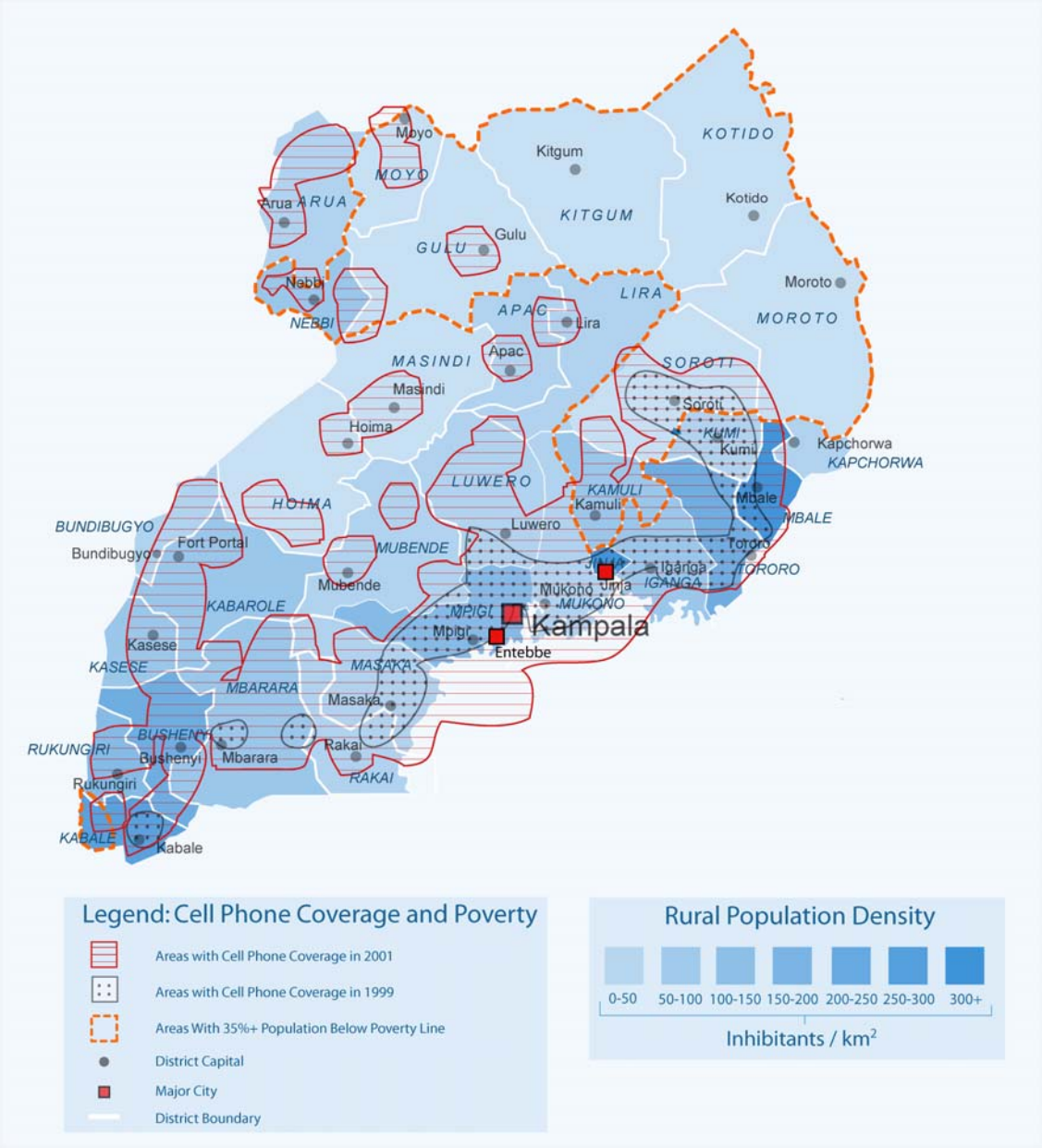
Figure 6.1.2 displays aggregate mobile coverage - for all providers – in Uganda in 1999 and 2001. It highlights both the general success, and the limitations, in extending coverage. Firms have mostly extended to the borders of the most difficult areas to serve, but have not yet moved into their center. An implication of this is that the poorest areas are still awaiting service.

There has indeed been great success in extending telecommunications service coverage beyond city centers into rural areas. But there has not been significant expansion into the

[36] MTN Information Memorandum, August 27, 2001.

[37] Source: ITU, UCC

FIGURE 6.1.2 – MOBILE TELEPHONE COVERAGE IN 1999 AND 2001[38]



[38] Sources: Coverage Area-GSM World's Website; Poverty data - Definition of poverty line taken from Uganda: The Challenge of Growth and Poverty Reduction; A World Bank Country Study, 1996, P.93/94 Poverty Line Map: Relief Web International http://wwww.reliefweb.int/w/map.nsf/wByCLatest/ECF060A8E165815685256A0D006FAC55 adopted from Distribution of Poverty in Uganda, USAID Famine Early Warning System, 1997. Population Data - RCDF Intelecon report, Annex B - Sub-County Statistics And Network Coverage Estimate By District - Page 1 Rural population density was calculated by increasing 2000 rural population by 5.4 percent (an estimate of population growth over the past two years), and dividing by the district's surface area

(large) portions of Uganda with the strongest rural characteristics. At least not yet. Policy attention – in particular, the Rural Communications Development Fund - is now focused on exactly this challenge.

6.2 Service Quality and Prices to Existing Customers

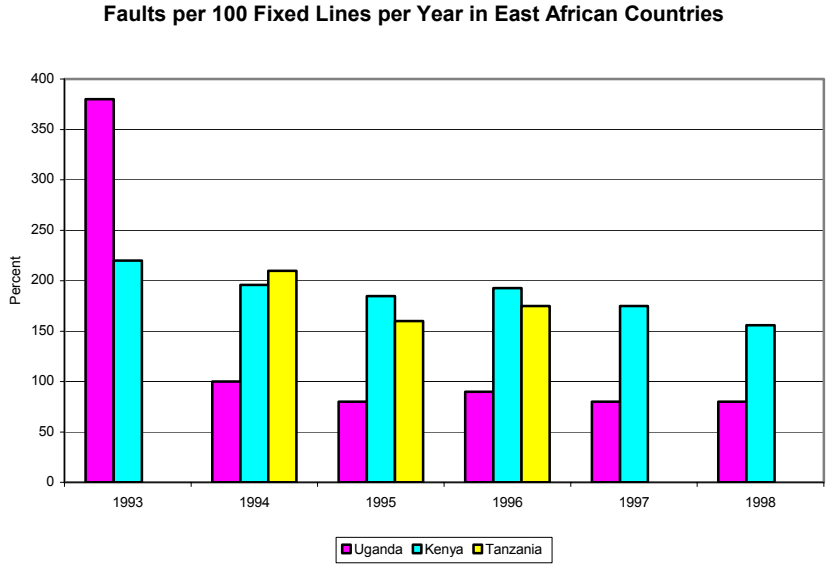
Altough the major operators are required by their licenses to provide "quality of service" reports to the UCC on an annual basis, repeated requests for this information (to operators and the UCC) went unanswered. The UCC indicated that the operators have filed these reports, but we were not able to obtain copies.

Many different stakeholders have revealed that the quality of service provision in Uganda has improved enormously since the beginning of the reform program.

Rural customers in Luwero, Kamuli and Kiboga complained that UTL payphones often provide poor quality (e.g., low call completion rates, high degree of background noise), require a long wait, or are out of service entirely. MTN Publicom has presented a valuable competing option. The firm reports that 95% of its payphones are operational at any given time, that faults are routinely repaired in less than a week and that call completion rates regularly exceed 85%.

ITU provides useful historical data for comparing Uganda's recent performance with its East African neighbors, Kenya and Tanzania. ITU relies on "faults/100 fixed lines per annum" as its measure of quality. Figure 6.2 plots this parameter for the period 1993-1998. Uganda's improvement through this period is by far the greatest. As the period ends just when the impacts of reform in Uganda were becoming most pronounced, this comparison likely understates the impact of the reforms.

FIGURE 6.2 – INDICATOR OF QUALITY OF SERVICE IN UGANDA AND ITS NEIGHBORS[39]



[39] Source: ITU 2002

Prices have also improved, propelled by competitive dynamics. MTN offered significantly lower rates than Celtel when it entered the cellular market, and quickly became the dominant provider. When UTL introduced their cellular service last year, it attracted new customers by charging no monthly service fees. MTN responded by lowering its monthly service fee from USh 18,000/month to USh 10,000/month. Data from the World Bank Development Economics Group reveals that the average price of a three-minute call in Uganda has decreased from approximately 20 to 13 U.S. cents.

6.3 Financial Performance and Financial Viability

MTN was profitable in fiscal year 2000, and appears to have earned a reasonable rate of return on invested capital that year. UTL reported a positive profit for 1999, but we have not seen independent verification. Celtel did not earn a profit in either 1999 or 2000. Available financial data is summarized in Table 6.3. While the operators have claimed that several rural areas have been profitable, others have generated losses. As discussed above, the more (commercially) difficult areas remain to be served.

TABLE 6.3 –OPERATORS' RECENT FINANCIAL PERFORMANCE[40]

	Celtel		UTL		MTN	
	1999	2000	1999	2000	1999	2000
Revenues	13,244	12,705	n/a	n/a	27,100	60,091
Net Profit	(1,860)	(4,741)	n/a	n/a	(4,477)	10,414
Assets	28,096	35,210	n/a	n/a	29,991	89,066
Depreciation and Amortization	2,839	5,269	n/a	n/a	882	6,506
Cap Ex	6,343	11,800	n/a	n/a	42,000	44,000

Notes:
All data in US$ thousands

Telecenters, which provide an important distribution channel in rural areas, struggle to main financial viability. An example is the Nakaseke multi-purpose community telecenter in Luweero District, an organization providing an important (and often subsidized) community service. Staff have expressed concern about long-term prospects without external support. While price increases are an (unattractive) option, it is not clear that customers would be willing to pay. The World Bank reports that the Nabweru and Buwama telecenters in Uganda run deficits of approximately US$750 per month.

While it is difficult to find examples in Uganda of telecenters that appear financially self-sustaining, an exception may be school-based telecenters. The opportunity to cross-subsidize

[40] Source: MTN: 27 August 2001 Information Memorandum; Celtel: MSI-Cellular

center operations with mark-ups on school fees may provide the platform for commercial viability.[41]

Several schools in rural areas have been provided a VSAT under the Schoolnet program in exchange for payment of a subsidized rate of US$200/month per school to the overall US$6,000/month cost of ISP service. The schools are required to develop – with the assistance of WorLD (a global learning network funded by the World Bank and the Gates Foundation) - business plans and plans for marketing services to the local community; and are eventually expected to pay the full unsubsidized rate of $400/month for ISP service. It is hoped that revenues from the provision of community service, combined with mark-ups on school fees will provide sufficient revenue. If so, schools will likely become the most common "vanguard institution" (as the term is employed in the RCDF Policy) for providing ICT services in rural areas.

[41] The World Bank reports that a typical urban secondary school can raise around US$1,400 per month from a contribution of approximately US$5 per student per term. The smaller size and lower fee structure of rural schools will produce smaller figures.

SECTION VII – PRELIMINARY LESSONS

7.1 Don't be Seduced by Privatization (and Licensing) Proceeds

The privatization process and the licensing of new major private operators impacts the overall reform program in important ways. Terms established during a privatization process, once documented (often in a contract, sometimes – as in Uganda, in a license), become de facto industry policy.

While the commercial interests of operators are often aligned with the broader policy interests of government, this is not always the case. Areas where these interests are not aligned can present tough choices for governments at the time of privatization. A well-intentioned determination to offer attractive terms to promote a lively and competitive bidding process, and secure a generous winning bid, can have repercussions for years on market structure and industry dynamics.

The Ugandan Government appears to have understood this point. By not establishing short-term proceeds as a core objective of the privatization program, it retained a great deal of policy flexibility. This flexibility was leveraged in the specification of rollout requirements that have been one of the key drivers of the telecommunications system expansion.

7.2 The Power of Competition

The fundamental economic tradeoff in market design is between economies of scale (offering the prospect of low prices through reduced unit costs of production) and competition (offering the prospect of low prices through the discipline imposed by a market). There is no general answer to the question of how best to balance the tradeoff.

Infrastructure industries – because of the high fixed costs of investment, which lead to large unit cost reductions as firm output increase – have traditionally favored scale economies, often to the extent of establishing and regulating monopolies. But for mobile telecommunications technology, where fixed costs comprise a smaller portion of the overall cost than for fixed-line networks, the "natural monopoly" character of the service has declined. Competition becomes a much more attractive alternative.

The experience of telecommunication operators in Uganda provides valuable evidence on the dynamics of competition. While economists and other industry observers often make the case for competition (over regulation) with respect to improved financial incentives, this misses the more important point. Strong financial incentives can be established within a regulatory framework by various forms of performance-based ratemaking schemes. But different driver of company performance – professional pride – cannot be as easily motivated with a regulated (as opposed to competitive) environment. Companies respond in interesting and dramatic ways as they are directly challenged by others. A naturally competitive professional instinct appears to consistently drive a cycle of entrepreneurial activity and service improvements. It is a powerful dynamic that cannot be replicated administratively. In Uganda, there has not only been intense

competition among the three major operators - with respect to price, product differentiation, innovation and marketing – but also a particular sort of competitive dynamic has emerged. MTN, having established itself as the dominant firm in the mobile business, appears to have lost some of the aggressive edge with which it initially entered the market. In contrast, managers at both Celtel (which has never quite gotten off the ground) and UTL Telecel (the upstart) have described more aggressive expansion plans. It is likely that a new stage in an ongoing cycle of competitive benefits is about to begin.

7.3 Two Steps Toward Universal Access

Perhaps the best indication of the overall results of the Ugandan telecommunications reform program is displayed in Figure 6.1.2. This displays both the great success of the reforms (in significantly expanding service outside the main cities) and the limitations of the reforms (in not yet reaching the most difficult rural areas in the northern region and the areas surrounding, but still remote from, secondary towns throughout the rest of the country). The unserved areas are now specifically targeted - within the Rural Communications Development Policy of 2001 – for subsidy support from the Rural Communications Development Fund.

This two-stage approach – whereby, companies begin by pursuing commercial opportunities (perhaps, as in Uganda, motivated by both competition and specific roll-out requirements) and, second, governments provide subsidy support to "fill in the gaps" after the limits of commercial viability have been revealed – worked very well in Uganda. While application of this approach requires carefully thinking through several detailed implementation issues (to ensure, in particular, that the prospect of future subsidy does not delay the pursuit of commercial opportunities), it provides an effective way of leveraging limited subsidy dollars.

7.4 There are Unique Challenges (and Hidden Opportunities) in Serving Rural Customers

This rural customer base needs to be evaluated and served differently than urban customers. Rural customers will often have little understanding of the benefits of products and services that have not previously been marketed directly to them. This has been seen – and is still being seen – most clearly in Uganda with respect to non-telephone ICT applications. More education – not just marketing, but perhaps other forms as well – is surely required.

Conversely, companies often find it difficult to evaluate and understand rural customers, particularly with respect to willingness to pay for service. Traditional models for evaluating the size and attractiveness of potential markets may not work well in rural areas. Both MTN and Celtel claimed that Ugandan tax and income statistics (standard inputs to the business models) underestimated market potential. These statistics do not reflect the (often significant amount of) income generated by gray market activities. They also do not reflect remittances to rural citizens from urban and international relatives, and various forms of wealth in rural (particularly agricultural-based) areas. The net effect is that rural customer demand is often underestimated.

Separate from the difficulties associated with evaluating the demand for rural service, there are aspects of the rural customer's purchasing patterns and demand drivers that are unique. For example MTN recently issued pre-paid cards in smaller denominations to more effectively address rural purchasing patterns. Ensuring that pre-paid cards are available to rural customers through distribution networks that are customized for rural realities has proven to be important. Also, the specific locations of payphones may have a significant impact on telephone use among users, particularly women (with heightened concerns over safety, ability to travel, and retaining access services in areas dominated by the presence of men)

7.5 Shared Access - Power to the Middleman

The term "duopoly" is misleading in the context of the Ugandan telecommunications industry. While two major operators have indeed been provided exclusive rights to provide full telephone service (with a third operator allowed- through a grandfather provision – to compete in the most active segment of the telephone market), a large part of the vibrancy of the industry is rooted in the collections of value-added providers of service. Many have arisen in Uganda. They include gas station and franchised kiosk distributors of phone cards, as well as individual resellers of phone services (i.e., human call boxes). The work of MTN Publicom in the provision of payphones has been particularly important in this regard.

The introduction of these types of providers enlivens the industry with an element of economic activity that, while difficult to measure, in some ways changes the nature of the business. It makes clear that access need not be defined in terms of dedicated connections. The most pronounced effect of the middlemen in the Ugandan telecommunications sector is their ability to extend service – in a variety of ways - to customers that would not be candidates for a traditional (dedicated) connection. The universe of potential customers is expanded.

The extension of access in this manner tends to be done best by a certain type of economic agent; one that does not always receive enough attention in the infrastructure industries. Industry observers and analysts have come to clearly recognize the large gap in entrepreneurial energy between private and public companies. But what has perhaps been less well noted is an equally important gap within the private sector related to size. Government officials report that small companies and individual entrepreneurs have become very active in identifying opportunities and presenting business plans to the three large operators. The RCDF is wisely seeking to leverage this creative energy by providing small grants for small businesspeople.

7.6 There is More than One Way to "Regulate" Price

Retail rates for telecommunications services are largely unregulated by the UCC. While this lack of administrative price regulation would normally be a great concern in a traditional utility environment, it does not appear to have created much difficulty in Uganda, where two factors constrain the ability of companies to impose high rates - supply competition and high demand elasticities.

High elasticity of demand, which is often overlooked as a significant restraint on market power, is particularly important in the rural context. A fundamentally unfortunate fact of rural socio-economic life – i.e., the population becoming accustomed to living without what others recognize as "essential" services - creates a powerful economic weapon against predatory pricing. Rural customers can be extremely discriminating precisely because they have – and probably can again – live without the service. Companies in Uganda have reported that their customers are indeed price sensitive and are generally willing to switch suppliers for better deals, or abandon service entirely. This type of demand response – particularly when combined with significant supply competition - provides an important form of price "regulation" and thereby reduces the need for regulatory agencies to administratively control price.

7.7 The Skills of Government Personnel and Policy Flexibility (and the Connection Between the Two)

The quality of the personnel heading some of the key government agencies involved in the telecommunications sector is very high. This has no doubt been a key driver of the success of the reforms. In addition to the importance of the structural factors that are the primary focus of the report, it is worthwhile to remember the very large impact highly skilled government employees can have on a reform program. In Uganda, there has very likely been a connection between the high skill level of policymakers and regulators, and the flexibility that has characterized the overall reform process.

Elements of the reform program often did not play out as originally conceived. One example is the original focus on fixed-line service. Given the original expectation, one might be tempted to downplay the policymaking role in the mobile boom. But this would miss a larger point. It's mostly impossible to predict technological evolution. The challenge for policymakers is not always to anticipate, but also to adapt to changing circumstances. Given the way the industry has evolved, it is perhaps hard to recognize that most of the success over the past few years could have been easily avoided if the Government had stubbornly insisted (through a narrow reading of "subscriber line" obligations in the license) on seeing its original expectations realized. And this is perhaps exactly what could have been expected if the key agencies were staffed at the top with leaders that did not understand the industry and their responsibilities so thoroughly. It is the existence of skilled and knowledgeable leaders, and the confidence it engenders, that provides for policymaking process that can adjust as required.

The flexibility displayed in this area was not unique. In many different areas – e.g., the decision to change the law to introduce competition before privatizing UTL, the determination of the privatization Unit to fill a regulatory gap during the process; the recent focusing on rural areas and ICT applications – the Government has consistently shown the knowledge and the willingness to adapt policy and procedure to current requirements.

APPENDIX A - INTERVIEWS

Organization	Persons met	Issues highlighted
Government Agencies		
Ministry of Works, Housing & Communications	Hon. Minister Nasasira Communications Commissioner Godfrey Kibuuka	▪ Ugandan telecom success story has been due to GoU permissiveness and competitiveness of open market ▪ Private sector cannot be relied upon to provide service everywhere. The RCDF is needed. ▪ RCDF may not have deep penetration for Internet, data services in rural areas ▪ Draft GoU ICT policy goes beyond provision of telecom infrastructure; also emphasizes roles/responsibilities for ICT provision, including "e-government" enablement
Ministry of Finance, Planning & Economic Development (Privatization) / Privatization Unit	Hon. Minister of State for Privatization, Peter Kasenene Mr. Michael Opagi, Director-Privatization unit	▪ Privatization Unit set up in 1993 to handle reforms, privatization and divestiture of parastatals ▪ UPTC was unbundled first before privatization ▪ Major driving forces behind reforms and privatization was accessibility to and affordability of services ▪ License to Celtel in 1995 was an attempt to bring in private players ▪ In the interim, Privatization Unit acted as regulator ▪ MTN licensed as SNO before sale of UTL ▪ MTN and UTL have gone beyond expectations in rural telecom service provision.
Privatization & Utility Sector Reform Project (PUSRP)	Emmanuel Nyirinkindi, Director-Utility Reform Unit Grace Charlotte Kabunga Team Leader	▪ Created in 1999. ▪ Responsible for reform of utility sector, privatization of Parastatals and monitoring ▪ Parastatal Monitoring Unit formed in 1996 ▪ Role of PURP is to support Privatization Unit in determining and monitoring financial viability ▪ The Utility reform Unit also helps build capacity in UCC

Organization	Persons met	Issues highlighted
Ministry of Energy & Mineral Development (Coordination of rural electrification project)	Eng. Paul Mubiru, Assistant Commissioner for Energy Efficiency	▪ Agreements for the Energy for Rural Transformation (ERT) Project were signed December 2001 ▪ Existing options for rural electrification include grid extension, mini grids, hydropower, biomass & solar PV ▪ ERT is private sector driven ▪ ICT is a component of the ERT and handled by UCC, an implementing partner ▪ Have established a rural electrification fund in charge of extending small grants and will be managed by a Board ▪ ERT's main strategy is to start at areas where there is concentrated demand and move backwards to household level
Uganda Electricity Transmission Company Limited (UETCL)	Mrs. Grania Rubomboras, UEB Manager	▪ Uganda Electricity Board was unbundled along functional lines of generation, transmission & distribution. Management control is still with government ▪ Since unbundling, UEB has not extended services to rural areas because it is not viable financially ▪ Rollout is directly handled by the Rural Electrification Project which will adopt various models for extension
Uganda National Council for Science & Technology (UNCST)	Dr. Z.M. Nyiira, Executive Secretary	▪ UNCST has been involved in ICTs since 1997; drafted ICT Policy for Uganda ▪ Sensitization is key in any ICT rural initiative. Chiefs can be used as facilitators of community sensitization ▪ Factors propelling the use of ICTs in rural areas are Content (relevant to people's needs), user-friendliness, awareness, human development, technological capability ▪ Human capacity development should be continuously updated to accommodate change in ICTs and their use. ▪ ICT efforts in the public sector have been donor driven and aimed at introducing and demonstrating the technologies
Regulator		
Uganda Communications Commission	Executive Director, Mr. Patrick Masambu; Technical Manager, Mr. Patrick Mwesigwa; Commission Secretary, Mr. Hodge Semakula;	▪ In 1977. UPTC established on caretaker agreement. ▪ In 1983, the UPTC Act was passed ▪ In 1993, established Initial reforms to review sector needs; investment recommendations were made in 1994 which led to 1996 policy ▪ The key elements of reform were to open up to a SNO, Privatization of 51% shares of UTL and to establish a regulatory body

Organization	Persons met	Issues highlighted
	Mr. Simon Bugaba; Project Officer, Mr. Arthur Muhangi	▪ Aim was to increase telecom teledensity, access to services geographically and quality of services ▪ Communications Act of 1997 unbundled UPTC into UPL and UTL. ▪ SNO licensed in April 1998 and started operations in October 1998 ▪ June 2000, Privatization of UTL ▪ September 1993, Celtel licensed ▪ In 1998, Uganda had 51000 fixed lines and 3000 mobile subscribers; by Dec 2001, this had increased to 60,000 fixed lines and almost 350,000 mobile subscribers ▪ There is open regulation for Internet. There are 17 licensed ISPs, close to 40 Cyber cafes ▪ MTN and UTL have 5 year exclusivity and duopoly, July 2000-2005. ▪ License requirement for MTN, UTL rollout is to provide every County with a public access point by 2005. ▪ RCDF was established as a deliberate effort to extend telecom services to rural areas (154 sub counties that will not be covered by the National Operators) ▪ All operators contribute 1% of their revenue to the fund
Telecom Operators		
MTN Uganda	Mr. Erik Van Veen, Marketing Manager; Mr. Geoffrey Kitakule, Market Planning Manager	▪ Forecast 1,000,000 customers by 2008; currently have slightly above 220,000 customers ▪ Not yet financially viable to put Internet services in rural areas ▪ MTN Uganda is profitable ▪ Have 200 base stations country wide ▪ Airtime tax has slowed down rollout plans
MTN Publicom	Flemming V. Jessen, Technical Adviser; Christopher Makooma, Finance Manager; Paul Kyakulaga, Sales Manager	▪ License requires MTN to install 2000 payphones, with at least 1 in every County, by April 2003. Publicom already has 2300 payphones in operation and is targeting 2500 payphones by deadline ▪ Market analysis reveals there is a demand for 10,000 payphones in the country ▪ Following and benefit from MTN network and coverage ▪ Have unfair competition from illegal operators especially in (peri) urban areas; their focus is on rural areas ▪ Have a central tracking system for payphones. 95% "uptime" for their phones; 30,000 calls/day from their

Organization	Persons met	Issues highlighted
		booths ▪ Maintenance is still centralized ▪ Have 2050 dealers, 15 wholesalers, 34 employees ▪ Have 55 solar-powered phone booths ▪ "rather talk than walk" campaign and public road show sensitizes people on how to use the phone
Uganda Telecommunications Limited (UTL)	Aimable R. Mpore, Ag. Managing Director; Rudiger Osburg, Chief Operating Officer; Stefan Omlor, Chief Operating Officer; Hans M.F. Paulsen, Commercial Director	▪ Need subsidy for areas that are not financially viable ▪ Going to rural areas is a matter of financing ▪ Internet demand is not as high in rural areas because it requires a minimum level of education an literacy. ▪ Have approx. 75,000 customers ▪ Carrying out rehabilitation of existing old links and aged technology ▪ Have 47 base stations ▪ MTN still has competitive advantage as they have far fewer employees (300 vs. UTL's 1200), new technology and no 'history' of being a parastatal ▪ Average time spent on phone is 2 minutes; by culture, Ugandans talk a lot ▪ Have biggest fiber optic network ▪ Had a handset subsidy scheme initially but it was too costly ▪ UTL has fixed, data & ISP, mobile services ▪ Airtime tax is prohibitive
Celtel Uganda	David Sserunjogi, Company Secretary (Finance and Regulatory Matters); Charlotte Kaheru, Operations Director Richard Mugera, Marketing Assistant	▪ Licensed July 1993 for 15 years ▪ Commercial operations only began in May 1995 because of the delay caused by bringing partners together, relationship with UPTC as regulator and competitor ▪ Shareholders include MSI, Vodafone, IFC, CDC ▪ Initial high pricing was due to strict requirements on laying of network ▪ Use GSM cellular technology ▪ Motivation for set up included need for communication, GSM technology and Ugandans living abroad ▪ Traditional market analysis to assess people's ability to pay is difficult, due to lack of documentation and people not revealing their real incomes ▪ Modification of license has given Celtel new competitive edge ▪ Have about 35,000 subscribers ▪ Have covered 43% of coverable area

Organization	Persons met	Issues highlighted
		▪ Airtime tax has prohibited rollout
ISPs		
Infocom	Barbara Nannono, Sales Administration Manager	▪ 70% of market share for ISP dial-up ▪ high degree of competition, but customer loyalty has been maintained ▪ have a local POP account in Jinja and plan more up-country ▪ Celtel is sister company; both owned by MSI
Afsat Communications	Grace Kintu, Customer Care	▪ VSAT is core area of competence. Varistar is bandwidth provider ▪ Offer ISP services for 250 dial up and 85 wireless customers ▪ Current sites in Kampala, Jinja, Mbarara ▪ New product (VSAT-based) will enable greater rollout to rural areas ▪ Rural areas only profitable with NGOs, donors so far ▪ Technology provider for VSAT schools in Uganda
Bushnet	Malcolm Brew	▪ Got special license to offer ISP services in 1995 ▪ Developed ISP services using HF radio; slow, but very reliable ▪ Donor funded Telecenters are not sustainable ▪ There is disposable income in rural areas that could be redirected to valuable/beneficial community services ▪ Strongly oriented to Internet protocol (IP) telecom services; feel IP is more appropriate technology for rural Uganda than GSM ▪ Serves 80 customers
Newspaper Reporters		
New Vision	Reporters, Mr. Steven Odeu, Mr. Geoffrey Kamali	▪ Licensing of SNO and new telecommunications have boosted local businesses; ICTs have enabled better coordination between buyers and sellers ▪ Private sector investment in ICTs is profit-motivated; development partners still need to be involved to advance developmental aspects (e.g., in health, education) ▪ Need more sensitization on telecoms for rural people to understand full benefits; advertising is not instructive ▪ For value-added services like E-mail and Internet sensitization is especially needed for rural people to use them
Private Sector		
Computer Frontiers	Director, Mr. Charles Musisi	▪ His company is an Internet solutions provider (web-hosting, E-mail hosting, call centre help desk etc.)

Organization	Persons met	Issues highlighted
		▪ Working as coordinator of Ugandan IXP; underway – implemented by end of March, 2002 ▪ RCDF will attract private sector to rural areas ▪ Access is larger impediment to rural service provision than (lack of) demand or ability to pay
Field Visits		
Luweero District Headquarters	Mr. Charles Lutaaya, Deputy Chief Administrative Officer (DCAO)	▪ The coming of MTN has improved District communication tremendously, especially between civil servants (agricultural extension, electoral monitoring) ▪ Fixed UTL lines are cheaper than MTN, but their service has been poor and inefficient ▪ There are some local entrepreneurs starting up private phone services, but they are not many yet ▪ Mobile phones are still expensive for an ordinary rural person but are convenient ▪ Initially, mobile phones were purchased because it was trendy to have one, especially among the youth; now they are used for business ▪ People in Luweero do not know much about E-mail and the Internet ▪ St. Jude Primary school in the district has E-mail ▪ There is untapped potential for using the local communication structure (i.e., between the CAO and the Chiefs) for ICT awareness creation at the village level
Nakaseke Multi-purpose Community Telecentre	Richard Bugembe, Project Coordinator and Members of the Telecentre Steering Committee	▪ UNESCO and IDRC-funded project to promote ICT use for development ▪ Originally provided library services, telephone, ICTs and training; no telephone or e-mail now as centre had fire and lightning strike knocked down UTL line ▪ MTN service does not reach Nakaseke well ▪ Building a community FM radio station ▪ Centre is presently not financially self-sustainable, as costs exceed revenues ▪ Will need to increase service charges to increase revenue; LC3 Chairman believes people will pay, given more costly, slower alternatives
Kigegge Village Residents, Luweero District	Augustine Bazaale, Outreach Officer Robert Miggadde, Administrative Assistant	▪ Operate a private (unlicensed) cellular phone business for village residents ▪ Are located high on a hill in open location, so have access to MTN network ▪ Have 5-6 customers/day and charge 800-1000 USh./ minute which easily covers 18,000 USh./month MTN service fee

Organization	Persons met	Issues highlighted
		▪ A profitable business providing a service in demand
Ndejje Secondary School - VSAT based School	Project Coordinator, Mr. Moses Okello	▪ Afsat is technology provider; just launched in Jan, 2002 ▪ Part of Schoolnet Uganda project (42 schools in all) ▪ Schools pay a World Bank-subsidized rate of USD200/ month for ISP ▪ Service free for teachers, students. People from community charged 30 USh./minute for online use. ▪ Need to develop a business plan on how community access time can be turned profitable ▪ Need to consider ISP as part of students' school fees
Kamuli District	Mr. Clement Kandoli, Resident District Commissioner;	▪ 1 UTL line at the district headquarters ▪ UTL services still inefficient (noise, lack of lines, no Internet/E-mail) ▪ Because of the usefulness of mobile phones, people are ready to sacrifice to spend on one ▪ Mobile phones were awakening and have become popular very fast ▪ Small holders and farmers use public phones a lot
	Mr. Paul Gahafu, CAO	▪ Difference between government and private services is efficiency and quality ▪ UTL services have not yet improved since privatization ▪ MTN network coverage should be extended to sub-counties because there is demand ▪ Civil servants can afford to pay for telecom services (average income per month is approx. USh. 100,000) ▪ Of 650,000 people in District, believes 10-20% of people could afford to own a MTN phone and pay service fees
UTL Kamuli District	Eng. James Ndali, UTL Manager Kamuli	▪ Services are demanded in rural areas but telephone wires and poles are stolen and maintenance is a problem. They no longer provide services to rural areas in the District ▪ 120 UTL fixed line functional in the district, with 40 lines used by local government (heard from earlier interviews with RDC & CAO that only one line is now functional) ▪ Have had digital exchange since 1995 ▪ UTL Mango service coming to Kamuli ▪ Electricity provision serious problem in Kamuli; UTL has generator and batteries for power outages ▪ About 5 people demand for new telephone connections per month

Organization	Persons met	Issues highlighted
		▪ Some inquiries have been on email services
Uganda Development Services	Charles Eyomu, Programme Manager; Moses Kasone, Computer Trainer; Rosette Nalugonda, Librarian	▪ Need to train rural customers on the advantages of new services ▪ Companies not always expanding aggressively enough into difficult areas ▪ Government subsidy will be necessary
Kiboga District	Samuel Mpiima, Assistant CAO	▪ There is one UTL telephone booth in the entire district which is still not efficient ▪ District has capacity to use and pay for services ▪ Main economic activity is cattle keeping and agriculture ▪ One cow costs between USh. 250,000 – 500,000 and a liter of milk cost USh. 500. With frequency of sales of these commodities he has seen, there is a demonstrated ability to pay for telephone services in Kiboga ▪ Road paving from Kampala-Kiboga-Hoima also having positive economic impact on District
	Mr. Mubiru Mbaziira, Hospital Administrator	▪ UTL line not operational for over a year and communication has been a major barrier ▪ Hospital has established an internal communication system ▪ Their ambulance service significantly compromised by there not being a phone at the hospital ("people die while waiting") ▪ In absence of a telephone, the hospital communicates using radio calls ▪ Staff moves a lot to Kampala in order to communicate and make phone calls, use e-mail. Staff is unproductive during these times. ▪ A big portion of the hospital budget goes on transport and allowances for officers going to place orders for drugs, hospital supplies in Entebbe. ▪ MTN is setting up base station in Kiboga and about 100 people climb the mountain daily to check on the progress ▪ On affordability, the Administrator said the hospital employs 200 civil servants with 120 established and these can afford to pay for mobile services ▪ Anticipate having incoming phone, fax and email lines when MTN network established. Will greatly facilitate hospital's association with international health organizations, like the Canadian Federation of Gynecologists

APPENDIX B – TELECOMMUNICATIONS SERVICES PROVIDED IN UGANDA

While our focus throughout this report will be on basic voice telephony, both fixed and mobile (because this is the bulk of what's been provided in rural areas), and, to a lesser extent, narrowband and broadband data services, a wide range of ICT services is being provided throughout Uganda. This section is meant to give a sense of how active ICT markets in Uganda have become by identifying and briefly describing these services.

B.1 Voice Telephony

Voice telephony services comprise local, national (long-distance), and international calls. The two technologies employed in Uganda for providing these services are fixed-line (landline and fixed-wireless) and mobile cellular (wireless).[42]

B.1.1 Fixed-Line

The two forms of fixed-line service are as follows:

- ***Landline Services*:** A landline network – also referred to as a Public Switched Telephone Network (PSTN) – connects all customers through a series of transmission and distribution lines. Telephone exchanges move calls throughout the network.
- ***Fixed Wireless***: Fixed wireless technologies provide telecommunications service without the use of wires or cable. This includes payphone booths, the predominant fixed wireless service in Uganda. While other versions of this technology – including very high frequency Wireless Local Loop and point-to-point microwave services – have been successfully deployed in rural areas in several developing countries, they are only recently being adopted in Uganda.

B.1.2 Mobile Cellular

This combines wireless voice telephony with mobility. All mobile cellular service in Uganda is based on the Global System for Mobile Communications (GSM) technology. GSM has become the dominant technology worldwide for digital wireless telecommunications. Despite limited (but increasing) use in the Americas, it is the standard employed in Europe, Africa and most of Asia and Australia.

[42] A third technology for voice telephony - mobile satellite services, commonly referred to as GMPCS – is not employed in Uganda.

B.2 Data

Data Services in Uganda generally refer to fax, Internet Access and virtual private networks (VPNs). More enhanced and data-intensive services such as video-conferencing are not commonly available.

B.2.1 Fixed Line Landline Services

Consumers with access to landline voice telephony have narrowband (beginning at speeds of 9.6 kbps or 14.4 kbps and upwards to 33.6) data services through dial-up.

B.2.2 Fixed Wireless

This service requires a stationary terminal at the customer premise connecting to the service provider through airwaves (point-to-point microwave or spread spectrum). Mobile operators in Uganda are using their GSM networks to provide fixed wireless data services in some areas. Narrowband (generally not exceeding 9.6 kbps) data services are available in this way. High speed fixed wireless services (64 kbps and 128 kbps) are available in Kampala using frequency hopping spread spectrum technologies. This service is being used by operators and their customers to create VPNs for large businesses with several offices in Kampala.

B.2.3 Mobile Cellular

Mobile cellular offerings in data currently include 9.6 kbps or 14.4 kbps transmission, mainly for SMS (short messaging service). There has been some Internet access, but speeds are slow. Higher generation mobile cellular data services such as GPRS, EDGE, and 3G services are not available.

B.2.4 Very small aperture terminal (VSAT)

VSAT service sends and receives data (and voice) transmission to and from satellite earth stations. The satellites are incorporated into global telecommunications networks and provide satellite-based communications to geographically dispersed locations in Uganda and throughout the world. Customers pay for VSAT equipment located at their premises and also pay service provider fees.[43]

B.3 Value Added Services

B.3.1 Payphones

These are fixed-line, un-staffed stations available to the public. They accept either coins or phone cards as payment. In rural areas, they normally appear in trading centers.

B.3.2 Phone Sharing

This is the service of providing an owned (most often mobile cellular) phone to customers for a fee. It's essentially a very short-term rental service. Because it is often not economical,

[43] Although VSAT technology can offer voice telephony– as, for example, in rural areas of South Africa – this is not currently available in Uganda. This is the sort of service that may emerge as the RCDF disburses its funds.

particularly in rural areas, for residential users to own phones, this has become a very popular service in Uganda, and has taken on a wide variety of forms.

B.3.3 Computer Sharing

This is the service of providing computer terminals with access to the Internet. The most popular form is the cyber café, which often provides not only computers and Internet access, but also additional products and services such as food, fax and entertainment. Many cyber cafés have recently emerged in Uganda, mostly in Kampala.

B.3.4 FM Radio

This is a form of non-interactive ICT that is particularly important for reaching out to rural residents, particularly those unable to access other services. More that 100 stations have become established in Uganda. Many of these are local language stations based in small urban centers, but with primarily rural coverage, providing a range of information important to the poor such as health education, family planning, commodity prices in local markets, civic education, etc. They incorporate an interesting mix of private, community, NGO and donor sponsors.

B.3.5 Solutions and Add-ons

This is the service of improving the functionality of core services by assistance, training, problem solving and the layering of additional features onto a core service (e.g., dial-up connectivity to an ISP, network security, web and mail hosting, etc.). This is not yet a big market in Uganda, but it does exist, predominantly (perhaps exclusively) in urban centers.

APPENDIX C – LEGAL FOUNDATION FOR TELECOMMUNICATIONS SECTOR REFORM

C.1 Telecommunication Sector Policy Statement of 1996

With a stated emphasis on increasing the affordability, accessibility and quality of telecommunications service throughout Uganda, the Government passed this policy statement at the beginning of 1996. It specified four core reform actions, as follows

- ***unbundle*** the postal and telecommunications operations of UPTC into Uganda Post Limited (UPL) and Uganda Telecommunications Limited (UTL);
- ***privatize*** UTL;
- ***liberalize*** the telecommunications sector; and
- ***regulate*** the industry by establishing and empowering an agency.

This Statement effectively specified the four cornerstones of the industry reform effort – unbundling (telecommunication from postal), privatizing (the unbundled telecommunications company), liberalizing (the industry by introducing competition for service) and regulating (through an independent agency).

The statement also emphasized the importance of increasing the geographic coverage of service. This emphasis effectively established a guideline for more specific rural development initiatives to follow.[44]

C.2 Communications Act of 1997

Guided by the previous year's Policy Statement, the Government passed the Uganda Communications Act in September 1997.[45] This identified more specific steps for implementing the four cornerstones of reform by:

- providing for the incorporation and privatization of UTL;
- defining the basis for introducing competition in basic telephone service through the licensing of a second national operator (SNO);
- establishing the Uganda Communications Commission (UCC) as the industry regulator and the Uganda Communications Tribunal as the agency responsible for resolution of disputes within the industry.

The Act expanded on the generally stated objective within the Policy Statement for system extension by identifying the following concrete measures:

- increasing the subscriber base to at least 300,000 by the end of 2002;

[44] While policy statements are approved by Cabinet and presented to Parliament, they do not have the force of law.
[45] The Act was amended two months later to allow for tendering for the SNO license before the UTL sale privatization.

- requiring operators to provide payphones and public call offices and related services in rural areas; and
- establishing the Rural Communications Development Fund, to be administered by the UCC.

The Act also focused on service quality by authorizing the UCC ensure the following:

- improved call completion rates; and
- 75% digitization of the national network.

APPENDIX D – UCC LICENSE FEES

No	Type of services	Fee
1	Internet Access Service	Application processing fee – US 340 Annual license fee – US 2,000
2	Public payphone / fax bureau service	Application processing fee – US 85 Annual license fee – US 500
3	2.4 GHz Wireless Spread Spectrum	Application processing fee – US 340 Annual license fee – US 2,000
4	Internet access and international data gateway	Application processing fee – US 340 Annual license fee – US 4,000
5	Public Internet café	Application processing fee – US 85 Annual license fee – US 500
6	Paging services	Application processing fee – US 51 Annual license fee – US 300 Frequency fee per transmitter per frequency – US 30 for VHF
7	Mobile trunked radio	Application processing fee – US 340 Annual license fee – US 2,000 Annual frequency fee per transmitter per frequency – US 30 for VHF, US 340 for UHF
8	Domestic courier service	Application processing fee – US 170 Annual license fee – US 1,000
9	Regional	Application processing fee – US 425 Annual license fee – US 2,500
10	International courier service	Application processing fee – US 850 Annual license fee – US 5,000
11	Broadcasting frequencies	AFE = Klog(Po/25)x(BW/12,500)x30 APF = 0.17 x AFE Where: AFE - Annual license fee in US, APF - Application processing fee in US Po – Transmitter power in Watts BW – Bandwidth in Hz K – 0.14
12	Agents of international Telecommunications equipment companies	Application processing fee – US 170 Annual license fee – US 1,000
13	Customer service and Internal block wiring	Application processing fee – US 170 Annual license fee – US 1,000
14	Two way private radio communication	Application processing fee US 8 for HF US 6 for VHF US 3 for VHF (hand held) Annual license fee per station per frequency:

		US 45 for HF US 30 for VHF US 13 for VHF (hand held)
15	Amateur radio	Application processing fee: US 8 for HF US 6 for VHF or UHF Annual frequency fee: US 45 for HF US 30 for VHF or UHF
16	Aircraft radio station	Application processing fee: US 8 for HF US 6 for VHF Annual frequency fee per station per frequency: US 45 for HF US 30 for VHF
17	Use of VSAT (single users)	Annual license fee – US 2,000 Registration fee – US 200 Type approval fee – US 20
18	Satellite Earth station (multi-user)	Annual license fee – US 10,000 Registration fee – US 15,000 Type approval fee – US 20
19	Inmarsat C	Application processing fee – US 22 Annual license fee per terminal – US 125 Type approval fee – US 20 Terminal registration fee – US 100
20	Inmarsat M	Application processing fee – US 85 Annual license fee per terminal – US 500 Type approval fee – US 20 Terminal registration fee – US 100
21	Inmarsat A	Application processing fee – US 128 Annual license fee per terminal – US 750 Type approval fee – US 20 Terminal registration fee – US 100
22	Inmarsat B	Application processing fee – US 213 Annual license fee per terminal – US 1250 Type approval fee – US 20 Terminal registration fee – US 100
23	Inmarsat with high speed data capacity	Application processing fee – US 22 Annual license fee per terminal – US 2500 Type approval fee – US 20 Terminal registration fee – US 100

APPENDIX E - THE MARKET FOR DATA SERVICES

Worldwide, with the rapid development of the Internet, data is replacing voice as the medium most often transmitted over fixed communications lines. Data are often transmitted over wireless connections as well. However, voice telephony remains the "killer application", and consumers are only beginning to become aware of data services.

There has been only a limited amount of development of data services throughout Uganda. Progress has been particularly slow in rural areas. While narrowband services are adequate for voice traffic and slow-speed Internet access, high-speed Internet access, video, and other applications requiring rapid data transfer will increasingly require broadband capabilities. In Uganda, the infrastructure for broadband capabilities is lacking in urban area and is almost non-existent in rural areas.[46]

E.1 Provision of Services

The UCC estimates the total number of dial-up (landline) Internet / email subscribers at 5,000 as of January 2002.[47] This translates into approximately 30,000 Internet users when a users / subscribers multiple of 6 is used.[48] The subscriber figure was 4,000 in July 2000. While this reflects significant growth over the past two years, most of the activity continues to be contained mostly within Kampala and a few other large cities.

The UCC estimates the total number of wireless Internet / email subscribers at 1,500 as of January 2002. This wireless Internet/email subscribership stood at only 500 in July 2000. Wireless service is provided mainly through GSM, VSAT, and other methods such as microwave or HF radio links.[49]

The number of Internet cafes has grown from only 3 at the end of 1998, to 30 in January 2002. Most of these are located in Kampala. They are licensed by the UCC.

Uganda currently does not have a national dialing code for local rate access to the Internet. Establishment of points of presence in district centers will eventually allow for rural users to obtain Internet access with a local call.

E.2 Demand for Service in Rural Areas

Because there has not been any significant attempt to provide data services in rural areas, there has not yet been an opportunity for demand to reveal itself. The general consensus among industry stakeholders (operators, regulators, Ministry personnel, local authorities, etc.) is that significant demand does not yet exist in the very rural areas. This presumption has mostly not been challenged. But different types of experimentation (e.g., telecenters and VSAT Schools), mostly financed by donor groups, are attempting to bridge the digital divide.

[46] A more detailed case study on the Internet market of Uganda is contained in "The Internet in an African LDC: Uganda Case Study," January 2001, International Telecommunication Union.
[47] The RCDF report estimates 6,000 subscribers in 2001, p. 11.
[48] ITU Study, p.16.
[49] Mobile operators in Uganda are not currently planning to upgrade their networks to provide data services with 2.5G or 3G technologies. These sorts of service have been slow to develop throughout the world, even in the most developed countries.

It does seem clear that rural residents do not yet think of Internet and broadband access as necessary in the same way as voice telephony. But it is unclear how much this is driven by consumers making informed judgments about relative costs and benefits, or, alternatively, a lack of understanding of the basic characteristics and the potential benefits of the services. To the extent the latter is important, this of course argues for education and training as strategies for stimulating demand. At this point, there appears to be little information, other than that rooted in assumptions, about demand for these services in rural areas.

The only market segments within rural areas that have thus far shown a clear demand for data services are the local government offices and NGOs.

E.3 Pricing

Prices for Internet access are unregulated, and are likely to be considered expensive by rural residents. The table below provides an example, for UTL dial-up services. The costs of installation and monthly fees are significant. In addition, a user must pay the per minute connection tariff for the telephone connection. Products and prices are summarized in Table E.3.

TABLE E.3 – UTL ONLINE DIAL-UP PRODUCTS AND PRICES
(July 2002)

Category	Description of service	Installation Fee ($)	Monthly Fee ($)
Diamond	Email* and Internet, Unlimited	30	45
Platinum	Email* and Internet, (Up to 30 hours a month)	30	30
Gold	Email* Up-to 20MB	30	20
Silver	Email* Up-to 10MB	30	10
Moonlighters	Email* and Internet, 7:00pm + All day Weekends	30	35

* Email service includes 10MB mailbox space for a subscribers mailbox *Source: UTL Online*

E.4 Plans for Further Expansion

The potential for broadband services has not gone unnoticed by the national operators. Both UTL and MTN have already laid approximately 200 km of fiber optic cable, creating rings that link exchanges in Kampala and Entebbe along with the International switch and Mpoma Earth Satellite Station. Outside the major cities, the majority of backbone network is provided by microwave links.

To establish a platform for interconnection among ISPs in Uganda, a domestic Internet exchange point (IXP) is being developed. By eliminating the need for using the international links for local traffic between the ISPs, the IXP will reduce the cost of doing business for ISPs and improve prospects for rural expansion of data services.

The RCDF can have a large impact on operators' motive to expand their services geographically. The RCDF disbursement for public telephony (infrastructure) is set at 40%; much of the rest is earmarked for broadly defined ICT projects, including 12% for Internet POPs and wireless Internet access.