2007 Zambia Telecommunications Sector Performance Review

a supply side analysis of policy outcomes

SIKAABA MULAVU

researchICTafrica.net

First RH page (blank)

2007 Zambia
Telecommunications Sector Performance Review

a supply side analysis of policy outcomes

Sikaaba Mulavu

The University of Zambia
P.O. Box 32379, Lusaka, Zambia
smulavu@unza.zm

Research ICT Africa! (RIA!) fills a strategic gap in the development of a sustainable information society and network knowledge economy by building the ICT policy and regulatory research capacity needed to inform effective ICT governance in Africa. The network was launched with seed funding from the IDRC and seeks to extend its activities through national, regional and continental partnerships.

The establishment of the RIA! network emanates from the growing demand for data and analysis necessary for appropriate but visionary policy required to catapult the continent into the information age. Through network development RIA! seeks to build an African knowledge base in support of ICT policy and regulatory design processes and monitor and review policy and regulatory developments on the continent.

The research, arising from a public interest agenda, is made available in the public domain and individuals and entities from the public and private sector and civil society are encouraged to use it for teaching, further research or to enable them to participate more effectively in national, regional and global ICT policy formulation and governance.

The network is hosted at the Witwatersrand University, LINK Centre, under the directorship of Professor Alison Gillwald. Each member country has a nodal member responsible for coordinating RIA! activities in his/her respective country. There are further regional coordinators for East Africa, Dr Lishan Adam, and for West Africa, Dr Olivier Nana Nzèpa.

For further information contact the RIA! coordinator Beki Nkala on nkala.b@pdm.wits.ac.za or go to www.researchICTafrica.net

Benin – CEFRED, Université d'Abomey Calavi
Botswana – University of Botswana
Burkina Faso – CEDRES, University of Ouagadougou
Cameroon – University of Yaounde II
Côte d'Ivoire – CIRES, l'Université Nationale de Côte d'Ivoire
Ethiopia – University of Addis Ababa
Ghana – STEPRI of CSIR
Kenya – University of Nairobi
Mozambique – Universidade Eduardo Mondlane
Namibia – Namibia Economic and Policy Research Unit
Nigeria – University of Lagos
Rwanda – KIST (Kigali Institute of Science, Technology and Management
Senegal – CRES
South Africa – LINK Centre, University of Witwatersrand
Tanzania – Tanzania Communications Regulatory Authority
Uganda – University of Makerere
Zambia – University of Zambia

East Africa Regional Manager: Dr Lishan Adam
West Africa Regional Manager: Dr Olivier Nana Nzépa

This research is made possible by the support of the Independent Development Research Centre, (IDRC), Ottawa, Canada.
Senior Programme Manager:
Heloise Emdon, hemdon@idrc.c
South Africa

Zambia

SERIES EDITOR:
Alison Gillwald

Other country studies in this series are available on www.researchICTafrica.com.

- Benin: Augustin Chabossou
- Botswana: Sebusang Sebusang, MP Makepe andTD Botlhole
- Burkina Faso: Pam Zahonogo
- Cameroon: Olivier Nana Nzèpa and Robertine Tankeu
- Côte d'Ivoire: Arsene Kouadio
- Ethiopia: Lishan Adam
- Ghana: Godfred Frempong
- Kenya: Tim Waema
- Mozambique: Americo Muchanga and Francisco Mabila
- Namibia: Christoph Stork and Mariama Deen-Swarray
- Nigeria: Ike Mowete
- Rwanda: Albert Nsengiyumva and Annet B Baingana
- South Africa: Steve Esselaar and Alison Gillwald
- Tanzania: Ray Mfungayma and Haji Semboja
- Uganda: FF Tusubira, Irene Kaggwa-Sewankambo, Apolo Kyeyune, Ali Ndiwalana, Annrita Ssemboga

Proof reading: Beki Nkala

ACKNOWLEDGEMENT
Many thanks to Mr. Muhango of the National Statistics Office for assisting in the collection of data pertaining to ICT usage by government. It was not an easy task and I am glad that notwithstanding the various obstacles we encountered, it was finally done.

List of Abbreviations and Acronyms

3G	Third Generation Mobile Technology
AMPS	Analogue Mobile Phone System
ARICEA	Association of Regulators of Information and Communication for Eastern and Southern Africa
ATU	African Telecommunications Union
CAZ	Communications Authority of Zambia
CDMA	Code Division Multiple Access
CEC	Copperbelt Energy Company
COMESA	Common Market for Eastern and Southern Africa
DOMSAT	Domestic Satellite
xDSL	Digital Subscriber Lines
EASSy	Eastern Africa Submarine cable System
GDP	Gross Domestic Product
GSM	Global System for Mobile Technology
IRB	Independent Regulatory Board
IBA	Independent Broadcasting Authority
ICT	Information and Communication Technology
IMF	International Monetary Fund
IMIS	Integrated Management Information System
ISP	Internet Service Provider
ITU	International Telecommunications Union
MDGs	Millennium Development Goals
NEPAD	New Partnership for Africa's Development
PDN	Private Data Networks
PSTN	Public Switched Telecommunication Network
PTC	Postal and Telecommunications Corporation
RIA!	Research in Information and Communication Technology in Africa!
SADC	Southern Africa Development Community
TBN	Trinity Broadcasting Network
TRASA	Telecommunications Regulators' Association of Southern Africa
VoIP	Voice over Internet Protocol
VPN	Virtual Private Networks
VSAT	Very Small Aperture Terminals
WLL	Wireless Local Loop
WSIS	World Summit for Information Society
WTO	World Trade Organisation
ZAMPOST	Zambia Postal Services Corporation
ZAMTEL	Zambia Telecommunications Company Limited
ZESCO	Zambia Electricity Supply Company Limited
ZNBC	Zambia National Broadcasting Corporation

TABLE OF CONTENTS

Zambia

Zambia
Executive Summary

There have been major developments in the ICT sector since the last sector performance review undertaken in 2004. The number of subscribers for mobile telephony has increased remarkably from 420 000 in 2004 to 1 438 491 in 2006. This represents a teledensity of 12.78% compared to the previous teledensity of 3.82%. This increase is in line with worldwide mobile trends. Mobile telephony is still concentrated in urban areas with 81.22% of the total subscriber base being in Lusaka and the Copperbelt. However, mobile telephony operators have recently embarked on vigorous roll-out plans aimed at extending their services to rural parts of the country. One of the mobile telephony operators already has its footprint in all nine provinces and seventy-two districts of the country. On the other hand, fixed telephony has remained stagnant. The number of subscribers was 86 000 in 2004 representing a teledensity of 0.78% (at an estimated population of 10 987 498). In 2006, the number was recorded at 92 941 representing a teledensity of 0.83%. The stagnation could be partly attributed to the growth of mobile telephony as people find it easier and more convenient to use mobile telephony albeit at higher prices. About 78% of subscribers are in the Lusaka and Copperbelt provinces. The incumbent telecommunications operator has, however, embarked on initiatives aimed at extending its services to rural areas using VSAT technology, the Domestic Satellite (DOMSAT) system and Wireless Local Loop (WLL). The company has also embarked on a US$48 million programme aimed at installing a national fibre optic backbone network that will cater for both national and international traffic.

The number of registered ISPs has increased from nine in 2004 to sixteen in 2006. The number of Internet users was estimated at 45 000 in 2004 (Gillwald, 2005). According to the Communications Authority of Zambia, the number of subscribers increased to 54 000 in 2006 and the current number of subscribers is at 10 843. Most of the ISPs provide broadband services. Given the low penetration rate of fixed telephony and the inherently low speed of dial-up connections, coupled with the emergence of low-cost broadband technologies, broadband solutions are expected to dominate the Zambian market soon.

The government has an estimated 8 700 personal computers in a government workforce of 117 056, revealing a personal computer:staff ratio of

0.074. This is extremely low given the potential contribution of ICT to the efficiency of any organisation. The figure also compares poorly to that observed in private companies where approximately 20% of staff have personal computers. The monthly government budget towards ICT usage is ZMK1.35 billion representing a monthly cost of ZMK11 532.90 per staff member. In terms of fixed telephones, the government has 1 470 fixed lines, which is a telephone line:staff ratio of 0.013.

In 2005 the telecommunications sector registered a growth rate of 23.2% compared to the growth rate of 5% reported in 2004. In order to promote further growth, the ICT sector requires a comprehensive national ICT policy with a clear and resolute implementation strategy. The national ICT policy was prepared and eventually approved in November 2006. It is hoped that the policy will give clear direction and the necessary impetus to the development of ICT in the country. It should, however, be mentioned that a policy on its own is not the ultimate aim. The policy should be backed with a comprehensive implementation strategy and, above all, an unequivocal determination to implement policy provisions. There is need for a strong political will to be manifested in the provision of the requisite environment, as well as resources. There is a need to promote universal access by extending ICT services to rural and underserved areas by implementing programmes such as the rural telecommunications development fund.

The law establishing an Independent Broadcasting Authority (IBA) was enacted in 2002. Given the converging technologies (broadcasting and telecommunications) it is important to integrate the functions of the Communications Authority of Zambia and the IBA. There is also a need to devise a pro-rural licensing regime that would promote the extension of ICT services to rural areas. There is further need to facilitate the licensing of other operators for international gateway. The current licence fee of US$16 million is prohibitive. The country should further promote the use of cost-effective telecommunications solutions such as VoIP, as these have the potential of lowering the cost of ICT services in the country.

Introduction

Research ICT Africa! (RIA!) undertook its previous telecommunications sector performance review in 2004. Seven African countries, including Zambia, participated in the review. The study sought to review the performance of the countries' telecommunications sectors at the national level against their stated policy objectives and strategies. As part of RIA!'s ongoing assessment of policy and regulatory outcomes in telecommunication sectors nationally and across Africa, the study was carried out again late in 2006.

This review provides a synopsis of the national social and economic indicators, a brief overview of the regulatory environment, institutional set-up and major developments in the sector. It then focuses on key ICT sub-sectors such as fixed-line, mobile, Internet, broadband, etc. Unlike the earlier sector performance review, the recent review has incorporated the aspect regarding utilisation of ICT by Government. This is in recognition of the fact that in most countries, particularly developing countries, governments are major consumers of ICT services. Admittedly, it is not easy to obtain sufficient information and statistics on the use of ICT by government, primarily because such information or statistics are either not available or highly fragmented in different ministries or departments.

The performance indicators in this review were obtained from various institutions such as the Communications Authority of Zambia (CAZ), the Ministry of Communications and Transport, the Ministry of Finance and Development Planning, the Central Statistics Office and the various telecommunications operators. Some of the information was obtained from literature review and various websites on the Internet. The above information was augmented by various personnel interviews.

National Social and Economic Indicators

Zambia is a landlocked country with a total surface area of about 752 614 km^2. The latest national population census was undertaken in the year 2000. The national population was reported to be 9 885 591 of which 4 946 298 were male and 4 938 293 were female. In the 2000 population projection report, the national statistics office projected the national population for 2005 to be 11 256 608. The Gross Domestic Product (GDP) per capita is US$584.25 (Central Statistics Office, Zambia, 2003/2004). The year 2006 saw a historical increase in copper prices on the international market, mostly due to high demand from China, which accounted for about 25% of the total world demand for copper, aluminium and steel. The average price of copper rose to US$3.05 per pound in 2006 from US$1.67 per pound in 2005. Copper constitutes over 53% of Zambia's foreign earnings. This, coupled with the increased volume in

copper exports (459 324 tonnes in 2005 to 492 016 tonnes in 2006), contributed positively to the GDP growth rate.

Real GDP growth rate for 2006 is estimated at 5.8% (against a target of 6% set in the annual budget) compared to the 5.4% and 5.2% recorded in the years 2004 and 2005 respectively. The growth was mainly driven by the mining, construction and transport sectors. In 2005, the telecommunications sector registered a significant growth rate of 23.2%, considerably above the national growth rate and the growth rate of 5% reported in 2004. In 2006 domestic borrowing was 1.5% of GDP against the target of 1.6% set in the annual budget. The country's external debt decreased from US$4.5 billion at the end of December 2005 to US$635 million as at the end of December 2006. This is mainly due to debt relief granted mainly by the International Monetary Fund (IMF), the Word Bank and the African Development Bank. The relief granted under various bilateral debt relief initiatives augmented the debt reduction, providing substantial savings in terms of debt servicing and availing funds for both private and public development programmes.

Inflation fell to its lowest level in the last 30 years. The annual rate of inflation in 2006 was 8.2% compared to 15.9% recorded in 2005. The average interest rate as at December 2006 was 21%. The average exchange rate by December 2006 was ZMK4 132 per US dollar against the ZMK3 428 average exchange rate recorded in December 2005, a depreciation of 20.5%. The average annual exchange rate per US$ was ZMK4 774.90 in 2004. In the 2007 budget, the government has targeted a real GDP growth rate of 7% and a reduction of inflation from the 8.2% recorded at the end of December 2006 to 5%. The government also intends to reduce government domestic borrowing to 1.2% of GDP

FIGURE 1. NATIONAL INDICATORS

Surface Area			752 614 km²
Population density (factor of population and surface area)			15 per km²
Total population (2000 Census)			10 757 19²
Male			5 280 267
Female			5 476 925
Total population (2004 Projected)			10 987 498
Total population (2005 Projected)			11 256 608
Male population			5 621 590
Female population			5 635 018
Growth rate (between 1969 - 1980)			3.2
Growth rate (between 1980 - 1990)			3.1
Growth rate (between 1990 - 2000)			2.3
GDP (ZMK billion)			25 917.0
Per Capital GDP (ZMK 000)			2 337
Interest rate (2006)			21
	2004	**2005**	**2006**
Growth rate	5.4	5.2	5.8
Average exchange rate	4 780	3 428	4 132
Inflation rate	21.4	15.9	8.2

Source Demographic data obtained from the Central Statistics Office.
Economic performance indicators obtained from the Ministry of Finance and Development Planning

ICT Policy Framework

Zambia was one of the first countries in Africa to embark on reform. The Telecommunications Act was enacted in 1994, establishing the Communications Authority of Zambia (CAZ) and dividing the Postal and Telecommunication Corporation (PTC) into Zambia Postal Services Corporation (ZAMPOST) and Zambia Telecommunications Company Limited (ZAMTEL). The telecommunications sector was also liberalised. The Radio Communications Act Chapter 169 of the Laws of Zambia was also enacted in 1994, and regulates the provision of radio communication services such as administration of radio spectrum by the Communications Authority. Later in 1994 the first Internet service provider (ISP) in Zambia, ZAMNET, was established, which has since been the leading Internet Service Provider in Zambia. In 1995 ZAMTEL introduced cellular telephony using Analogue Mobile Phone System (AMPS) technology. CopperNET was later established as a second Internet service provider in Zambia in 1996. It was owned by the mining conglomerate, Zambia Consolidated Copper Mines (ZCCM) located in the Copperbelt province of the country. Following the privatisation of the mines, CopperNET was sold to the workers in 1999 under a management buyout scheme and was subsequently incorporated as CopperNET Solutions. In 1997 the first mobile phone operator, Telecel, launched its cellular service using Code Division Multiple Access (CDMA) technology. The incumbent national

operator, ZAMTEL, launched its Internet service in May 1997, while the second mobile operator, Celtel, started its provision of cellular services in 1998. This brought the number of mobile phone operators to two. In 1999 Telecel replaced CDMA with GSM (Global System for Mobile) technology. Two more Internet service providers, UUNet and Microlink, subsequently started operations in 2001. In early 2002, ZAMTEL migrated from AMPS to GSM technology.

The Independent Broadcasting Authority Act (IBA) was enacted in 2002. This provided for the independent regulation of broadcasting services in the country. After lengthy consultations the government finally approved the national Information and Communications Policy in November 2005. In 2006 the pan-African mobile group operator, MTN, concluded its acquisition of the Zambian mobile operator Telecel. The company has since replaced the Telecel brand with its own and has engaged in a massive expansion drive.

Instititutional Framework

The Ministry of Communications and Transport is responsible for policy direction, while the Communications Authority of Zambia (CAZ) is responsible for telecommunications regulation. It should, however, be noted that according to Section 3(2) of the Telecommunications Act, power is vested in the Minister of Communications and Transport to appoint the nine members on the Board of the Communications Authority. This invariably gives the Minister great leverage in the operation of the authority, thereby undermining its independence. The incumbent national telecommunications operator, ZAMTEL, reports directly to the Minister responsible for communications and transport. This ultimately gives it undue advantage in terms of competition with other operators, as it is privy to most government internal operations and plans. It also creates a conflict of interest for the Ministry, who is the party responsible for both state shareholdings in the incumbent and national policy for the sector generally.

Regulatory Framework

The Telecommunications Act Chapter 469 of the Laws of Zambia regulates the telecommunications sector. It establishes the Communications Authority of Zambia (CAZ). The powers and functions of the Authority are exercised and performed by a Board of Regulators appointed by the minister responsible for communications and transport. The Act mandates the Communications Authority to supervise and regulate the provision of telecommunications services and products in the country and to promote competition in the sector. The Act consequently liberalised the telecommunications sector in the country; one of the functions of the Authority is to encourage major investors in the ICT sector. Prior to the enactment of the Telecommunications Act, a state-owned company, the Postal and Telecommunications Corporation (PTC), undertook regulatory functions.

The Act disbanded the PTC and formed two distinct companies, namely Zambia Postal Services Corporation (ZAMPOST), and Zambia Telecommunications Company Limited (ZAMTEL), that deal with postal services and telecommunications respectively. Liberalisation of the sector brought about the emergence of mobile operators as well as Internet Service Providers (ISPs). ZAMTEL has, however, maintained its monopoly in the provision of Public Switched Telecommunication Network (PSTN).

In 2002 the Independent Broadcasting Authority Act was enacted to facilitate regulation of broadcasting services through the establishment of the Independent Regulatory Board (IRB). The regulatory agency is, however, not yet functional due to the impasse between the independent media bodies and the government on the appointment of members of the Board. The matter is currently in process in the Supreme Court of Zambia following an appeal by Government on the decision of the High court. The Act also liberalised the provision of broadcasting services, which were previously monopolised by the Zambia National Broadcasting Corporation (ZNBC).
Telecommunications licences are regulated by the Communications Authority of Zambia. Currently Telecommunication service licences are provided in three distinct categories. The Authority categorises the licences as follows:
Licences that require service providers to install, own and operate public switched telephone network (PSTN) infrastructure facilities;
Licences that do not require ownership of public networked telephone facilities. This is the category into which Internet service providers fall;
Licences that require ownership of infrastructure facilities for cellular mobile and paging services.

The licensing framework and structure is different for each of the three categories and the licensing procedure is governed by the category in which the licence belongs.

Telecommunications Regulatory Environment

As part of the Zambia Communications Sector Performance Review, a Telecommunications Regulatory Environment (TRE) survey was conducted. The objective of the survey was to assess the effectiveness of the telecommunications regulatory environment in the country. This includes not only the regulatory but also the policy environment under which the regulator must act.

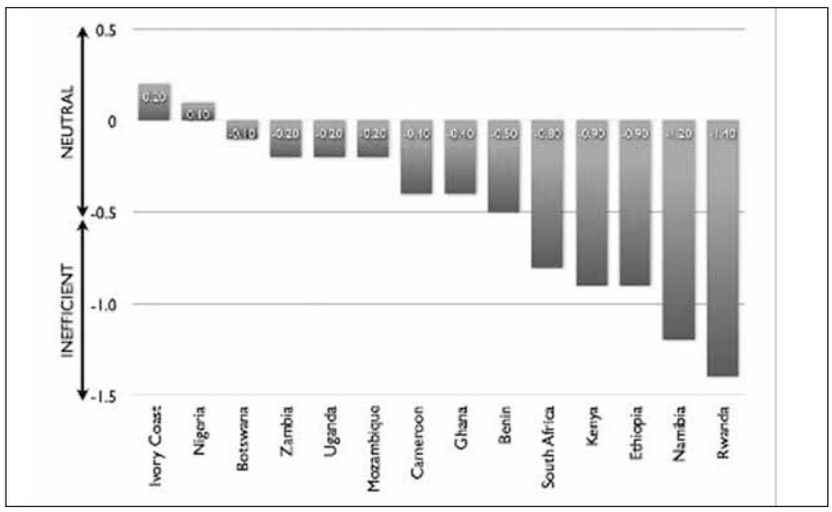
About 24% of respondents perceive regulation pertaining to fixed-line anti-competitive practice as highly ineffective. Similarly 21% believed this to be the case for mobile practice and 17% in relation to VANS. This is against the less than 7% across the three categories that viewed the regulatory environment as being highly effective. While 17% perceive the current fixed-line international gateway licensing regime as highly inef-

fective, with 21% for mobile and VANS, only between 7% and 10% view it as highly effective. The trend is similar in most of the categories, with most viewed as highly ineffective. However, it is noteworthy that some respondents were nevertheless satisfied with certain regulations. For instance, Internet service providers (ISPs) and Internet café operators indicated that market entry was easy. This is evidenced by the proliferation of Internet cafés and ISPs in the country.

The general trend is that most respondents perceive the regulatory environment as highly ineffective. The Communications Authority of Zambia has embarked on a campaign to educate users through the use of posters on the role of the Communications Authority and Users' rights. This is a positive step, given the fact that most users of telecommunication services are not aware of the role of the Communications Authority, their rights, or the obligations of telecommunications service providers. There is also a need to establish the Telecommunications Users Advisory Committee as provided for under Section 9 of the Telecommunications Act Chapter 469 of the Laws of Zambia. The principal function of the committee would be to consider complaints and comments from users of telecommunications services. The above measures are likely to contribute to an effective telecommunications regulatory environment, as the users of telecommunications services will be in a stronger position to identify bottlenecks and advocate regulations and policies that could foster an effective telecommunications regulatory environment.

In comparison with other countries in the regulatory perception survey Zambia did not fare well but with only Nigeria and Côte d'Ivoire viewed positively, the average perception of the regulatory environment across all the dimensions was at least closer to neutral than to ineffective.

FIGURE 2. TRE AVERAGE ACROSS COUNTRIES (



Source Esselaar, Gillwald and Stork (2007)

National Information and Communications Technology Policy

The consultative process of formulating a national Information and Technology Policy started in 2003 and was finally approved in 2005. Towards this end, national and provincial workshops were conducted, public discussions, seminars and meetings were held and public awareness campaigns were conducted through both electronic and print media. Both local and international stakeholders were consulted at various stages of the formulation process. The draft policy was eventually posted on the website in order to solicit public comment and opinion. The national ICT policy is based on thirteen "pillars", namely Human Resources; Education; Access media and culture; ICT as an industry; Telecommunications Infrastructure; E-governance; E-commerce; Agriculture; Health; Tourism, Environment and Natural Resources; Youth and Gender; Legal and Regulatory Framework; and Security in the Information Age. The government has since established a task force to develop modalities for the implementation of the policy. It can only be hoped that the task force will not again take an unnecessarily long time and deny the country an opportunity to effectively use ICT in its developmental agenda. Given the unenthusiastic approach governments normally take on matters pertaining to ICT, this fear is clearly well-founded.

Regional and International ICT Initiatives

Zambia is a member of both the Southern Africa Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA). It is also a member of the African Union (AU). Through this membership, the country participates in various programmes and initiatives undertaken by these regional blocks. In terms of Information and Communications Technology, Zambia is a member of the newly renamed Communications Regulators' Association of Southern Africa (CRASA) and the Association of Regulators of Information and Communication for Eastern and Southern Africa (ARICEA). Both these associations have developed guidelines to assist regulatory authorities, aimed at facilitating harmonisation of competition policies in the respective regional blocks. Member countries are expected to observe the policy guidelines such as ICT regulatory framework, competition policy, universal access, licensing, and interconnection agreements as well as ICT projects enunciated by these organisations. As an example, Zambia is participating in the COMTEL Project supported by COMESA. Zambia is also a member of the African Telecommunications Union (ATU) as well as the International Telecommunications Union (ITU). Through these international memberships, a member country undertakes certain obligations, engagements and commitments in terms of ICT development.

1 National ICT Policy

The country is, amongst other initiatives, participating in the Eastern Africa Submarine cable System (EASSy) project spearheaded by the New Partnership for Africa's Development (NEPAD) under the auspices of the African Union. In June 2006, the Johannesburg declaration underscored the need to construct the NEPAD ICT Broadband Infrastructure Network for Eastern and Southern Africa, including the EASSy cable. The EASSy project aims at rolling out an undersea fibre optic cable from South Africa to Port Sudan, along the Indian coast. Participating countries will connect to the cable at appropriate landing points. This will enable countries such as Zambia to have cheaper and high-speed international telecommunication services. The recently approved national ICT policy identifies the need to take into account regional and global policies in its implementation. It states that the implementation of the policy shall take into account relevant regional and global policies and best practices, targeting the UN Millennium Development Goals (MDGs), World Summit for Information Society (WSIS), World Trade Organisation (WTO), NEPAD as well as COMESA and SADC[1].

International Connectivity

To date the international gateway on voice communication is still under the control of the incumbent national telecommunications operator, ZAMTEL. The Communications Authority of Zambia has since indicated that mobile operators could obtain international gateway licences in order to establish their own direct links. The fee for the licence is set at US$12 million. Companies also need to comply with regulations that govern acquisition of the licence for the international gateway. It is highly questionable whether this amount is viable given the number of cellular subscribers in the country and the anticipated volume of international traffic. It is argued, perhaps accurately, that the licence fee has been set at such a prohibitive amount as a way of keeping the status quo vis-à-vis the monopoly of ZAMTEL in the international gateway. ISPs are, however, able to procure their own international connectivity using satellite and are required to apply for a radio licence to operate international Very Small Aperture Terminals (VSAT). This is, however, not the optimal means of transporting data.

National Fibre Optic Backbone

Zambia does not have a nationwide fibre optic backbone for national and international traffic. The only limited fibre optic cable networks are those owned by the Copperbelt Energy Company (CEC) and the state owned energy company, Zambia Electricity Supply Company Limited (ZESCO). The CEC installed a 24-core 520 km fibre optic backbone on the Copperbelt. ZESCO installed a 45 km fibre optic cable from Lusaka to Kafue. The two (ZESCO and CEC), including Pronet, operate as a carrier's carrier, as excess capacity on their networks is available for resale to users. The incumbent national telecommunications operator has embarked on a US$48 million project, earmarked to begin in 2007, aimed

at installing a national fibre optic backbone network. Once completed, the network will cater for the ever-increasing national and international traffic and enable the country to derive maximum benefit from the regional EASSy Project. The network could also be connected to the existing international backbones at Kariba (Zimbabwe), Kazungula (Botswana), and Katima Mulilo (Namibia) and improve telecommunications between these neighbouring countries that already have fibre optic backbones.

Fixed Telephony Services

The incumbent national telecommunications operator, ZAMTEL, has the monopoly in the provision of fixed-line telephone services. The telecommunications infrastructure covers most parts of the country using various technologies. However, the services are mainly concentrated in urban areas, particularly in major cities along the line of rail. According to ZAMTEL, about 78% of fixed lines are in the Lusaka and Copperbelt provinces of the country. The other vast parts of the country share the remaining 22%. The 2000 census undertaken by the National Statistics Office shows that the two provinces, Lusaka and Copperbelt, constitute about 30% of the country's population.

The telecommunications infrastructure has deteriorated over time. The network is predominantly analogue (with the exception of a digital link between Lusaka and Copperbelt provinces) and is mainly based on microwave technology. ZAMTEL has, however, undertaken major initiatives aimed at increasing accessibility of telephone services. In 1995 the company commissioned a Domestic Satellite (DOMSAT) system to provide telephony services to remote rural areas. This facilitated the extension of telephone services to locations such as Sesheke, Sinazongwe and Kaputa. ZAMTEL has also installed Wireless Local Loops (WLL) to cater for locations in peri-urban areas. This facility is ideal for rural areas or areas where terrain may not allow for the laying of cables. The system covers a radius of 50 km from the cell site. In order to enhance services for international traffic, the company commissioned a third earth station in 2002. The company has invested ZMK 36 billion on infrastructure development in the past three years.

It is noteworthy that the teledensity has been virtually stagnant since 1998. In 2006, the number of subscribers was 92 941 representing a teledensity of 0.826. The number of subscribers was 86 000 in 2004 representing a teledensity of 0.78 In 2000, the teledensity for fixed lines was overtaken by that of mobile subscribers (that stood at 1.0), barely three years after the introduction of mobile phones in the country. In 2006, the teledensity for fixed lines and mobile phones was 0.83 and 12.78 respectively. The 2006 teledensity (0.83) for fixed-line telephony shows a slight decrease from that of approximately 0.89 in the previous years. This could be attributed to the increase in the projected 2006 population

against an almost stagnant number of subscribers. The number of fixed lines in 100 households was at an average of 2.1 during the period 1995 to 2004 (Orbicom: Country series data). Meanwhile, the 2002/2003 Selected Social Indicators Survey report shows that only 2% of the Zambian households have a land phone line. During the same period, the report shows that 4% of Zambian households had a mobile phone. Considering the sharp increase in the uptake of mobile phones in recent years, this percentage has probably increased by a very large margin.

It is evident that the penetration rate for fixed lines has been extremely slow compared to that of mobile phones. This can largely be attributed to the fact that mobile cellular phones are more accessible and easier to acquire, albeit more expensive than fixed telephony. In 2006, the waiting list for fixed telephone lines was 8,201. This indicates that notwithstanding the high and fast penetration of mobile phones, the demand for fixed lines still exists. With reductions in the cost of mobile communication services (lower cost of mobile handsets and tariffs) coupled with low cost wireless technology for Internet access, and the flexibility and convenience of mobile communication, it can be predicted that the waiting list numbers would inevitably remain constant or even decrease over time. The graph below shows the teledensity for both fixed and mobile telephony since 1998.

FIGURE 3

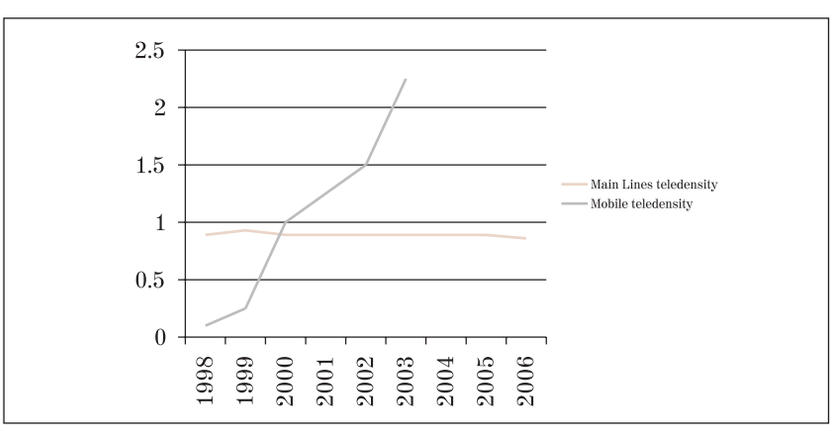


FIGURE 4. TELEDENSITY FOR FIXED AND MOBILE TELEPHONY

Description	Value
Main telephone lines in operation	142 713
Total telephone subscribers	92 941
Total telephone subscribers per 100 inhabitants	0.826
International telephone circuits	To be inserted
Waiting list for main lines	8 201
Business telephone installation charge	ZMK290 000.00
Residential telephone installation charge	ZMK100 000.00
Residential monthly telephone subscription	ZMK 20 000.00
Business telephone monthly subscription	ZMK 40 000.00
Minimum connection charge	ZMK 200.00
Minimum connection duration	60 seconds
Minimum charge - peak	ZMK200.00/ 60 seconds
Minimum charge - off-peak	ZMK100.00/ 60 seconds
Cost of a local 1 minute call (off- peak rate)	ZMK100.00
Cost of a local 1 minute call (peak rate)	ZMK 200.00
Cost of a national 1 minute call (off -peak rate)	ZMK300.00
Cost of a national 1 minute call (peak rate)	ZMK600.00
Cost of a 3 minute call to US (off -peak rate)	ZMK15 ,750.00
Cost of a 3 minute call to US (peak rate)	ZMK21 ,000.00
Main telephone lines per 100 inhabitants	1.2678

Note: Off-peak: 18:00 - 07:00
1US$ = ZMK4 132
Source: Zambia Telecommunications Company Limited

Mobile Cellular Telephony

In Zambia there has been an accelerated development of mobile telephony, in line with the worldwide trend regarding the growth of mobile service both in roll-out and access. There has been a remarkable increase in the number of mobile subscribers since the incumbent national telecommunications operator ZAMTEL first introduced the service in August 1995. The system was based on the Analogue Mobile Phone System (AMPS) technology. There are currently three operators in the cellular market using GSM technology, namely Celtel, Cell Z and MTN. Celtel is a subsidiary of MSI international and Cell Z is owned by the incumbent national telecommunications operator ZAMTEL. MTN Zambia is owned by the pan-African mobile operator MTN. Until August 2006, MTN Zambia was owned by Telecel Zambia, a subsidiary of Telecel International, a US-based cellular telecommunications group. As part of the licensing requirements, mobile cellular operators are required to sell 10% of the shares to the public through the stock exchange. This requirement is aimed at enabling nationals to invest in the mobile telephony telecommunications sub-sector. There are currently 1 438 491 cellular subscribers in the country; Celtel has 1 140 085 of those subscribers, representing 79.26% of the total number of subscribers, MTN has 203 970 subscribers

while Cell Z has 94 436 representing 14.18% and 6.56% respectively. The total number of mobile subscribers was recorded at 270 000 in 2002 and 420 000 in 2004, showing an increase of more than 200% over two years. The mobile subscriber base overtook that of fixed telephony in 2002, just a few years after the introduction of mobile service in the country. The teledensity for mobile cellular phones has also increased tremendously since 1998. In 2002, mobile cellular phone teledensity was at 1.25%, whilst that of fixed telephony was at 0.89%. The teledensity for fixed-line telephony stagnated up to 2006, while that of mobile cellular uptake steadily increased to 12.78%. The national ICT policy attributes the rapid growth of mobile service in the country to the following factors[2]:

There is unfulfilled demand for service in both urban and rural areas;
Mobile networks can be installed more rapidly than fixed lines;
Pre-paid mobile cellular service allows users to obtain services where they may not normally qualify for a fixed or mobile post-paid service because of their low or irregular income or lack of known and fixed-abode;
Users find the functionality of mobile phones extremely useful; and
Mobile technology infrastructure is less susceptible to vandalism.

Notwithstanding the aforementioned growth, mobile coverage is still largely concentrated in main urban areas along the railway line. Lusaka and the Copperbelt have a total of 1 168 436 subscribers representing 81.22% of the total national subscriber base. A vast part of the country only shares 18.77% of the total mobile subscribers. The Figure below shows the distribution of mobile subscribers.

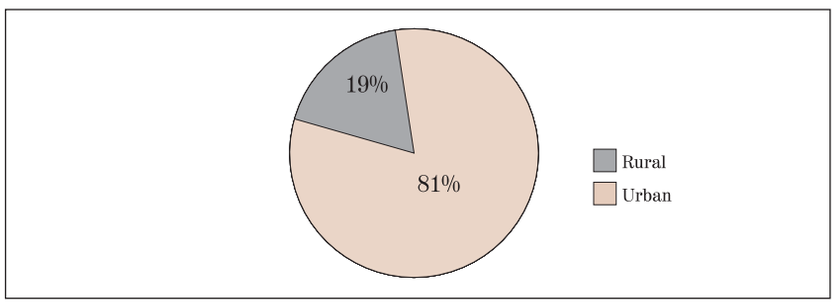
FIGURE 5. MOBILE SUBSCRIBER DISTRIBUTION

Operator	Location	No. Of subscribers	Percentage
Celtel	Lusaka	667, 325	58.53
	Copperbelt	244, 182	21.42
	Others	228, 578	20.05
	Total	1, 140, 085	100
MTN	Lusaka	110, 442	54.15
	Copperbelt	74, 284	36.42
	Others	19, 244	9.43
	Total	203, 970	100
Cell Z	Lusaka	44, 234	46.84
	Copperbelt	27, 969	29.62
	Others	22, 233	23.54
	Total	94, 436	100
All Operators	Lusaka	822, 001	57.14
	Copperbelt	270, 055	24.08
	Others	346, 435	18.77
	Total	1, 438, 491	100

Source: Ministry of Communications and Transport

2 National ICT Policy

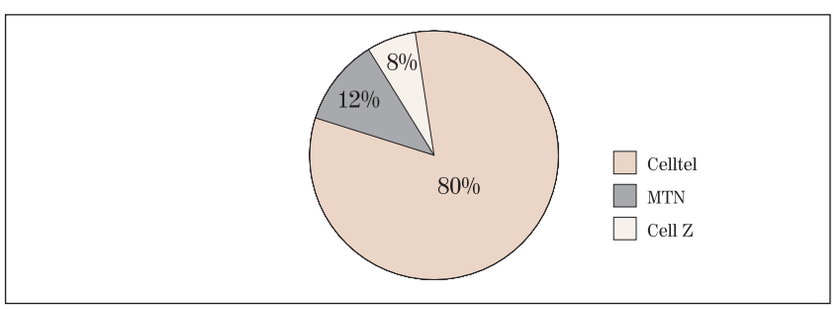
FIGURE 6. DISTRIBUTION OF MOBILE SUBSCRIBERS IN URBAN AND RURAL AREAS



Source: Ministry of Communications and Transport

It is, however, noteworthy that mobile telecommunication has gradually penetrated some rural parts of the country. This is mainly due to the vigorous and ambitious expansion drive undertaken by mobile operators in recent years. Celtel is now operating in all the nine provinces and 72 districts of the country. This is a major development in the telecommunications sector given the fact that these areas had had no communications services. In 2006, the company (Celtel) invested US$60 million towards expansion and improvement of its network compared to ZMK160 billion (US$ 46 million) spent in 2005. The company earmarked a total investment of US$110 million in 2006, part of which was channelled to the deployment of the first mobile Internet access facility in the country. Meanwhile, MTN plans to have a footprint in all nine provinces in the country by the end of 2007. Currently, it has a presence in seven of the nine provinces. Cell Z has plans to invest US$25 million in its expansion drive aimed at taking it to all the 72 districts and increasing its subscriber base to about one million by the end of 2007. The project will further upgrade Cell Z to third generation (3G) mobile technology. Current statistics from the Communications Authority of Zambia show that the current market share of the three mobile operators is as depicted in the chart below.

FIGURE 7. MOBILE TELEPHONY MARKET SHARE



Source: Communications Authority of Zambia

There has been a gradual decrease in the cost of handsets for mobile communication. The average price of a low range mobile handset was approximately ZMK800 000.00 in 2003 and averaged ZMK200 000.00 in 2006. This could be attributed to the general worldwide decline in prices attributed to technological advancement, coupled with a reduction in duty on mobile handsets to 15%. The average cost of a one-minute call within the same network is currently at ZMK1 140 (US$ 0.28). Unlike fixed telephony, there is no connection charge for mobile telephony. The cost of mobile services has reduced since the introduction of mobile cellular telephony in 1995. In particular, the cost of handsets, tariffs on calls, and SIM cards has reduced. For instance, the cost of a SIM card currently averages ZMK15 000.00 from about ZMK45 000.00 in 2002. Operators are also moving towards local currency (Kwacha) based tariffs, possibly as a result of the stabilisation of the local currency. Charges for Celtel and Telecel (now MTN) were previously in "units" linked to US$. Charges for Cell Z have, however, always been in the local currency.

FIGURE 8 (A): TARIFFS FOR MOBILE TELEPHONY

Operator		Cost per minute								
	ps or pm	Cell to Cell own network			Cell to Cell other network			Cell to fixed line		
		Peak	Off peak	Off-off peak	Peak	Off peak	Off-off peak	Peak	Off peak	Off-off peak
MTN	pm	ZMK 1066	ZMK 615		ZMK 1435	ZMK 820		ZMK 1435	ZMK 820	
CELTEL	pm	0.28 units	0.13 units		0.50 units	0.33 units		0.50 units	0.33 units	
CELTEL	ps	0.006 units	0.0028 units		0.01 units	0.0028 units		0.01 units	0.01 units	
CELL Z	ps	ZMK 20	ZMK 10		ZMK 20	ZMK 20		ZMK 20	ZMK 10	

FIGURE 8(B): TARIFFS FOR MOBILE TELEPHONY contd

Operator		Cost per minute								
	ps or pm	International call			SMS			SMS International		
		Peak	Off peak	Off-off peak	Peak	Off peak	Off-off peak	Peak	Off peak	Off-off peak
CELTEL	pm	2.02 units	1.52 units		0.07 units	0.07 units		0.15 units	0.15 units	

ps = per second billing; pm = per minute billing
International tariff for Celtel based on the average of the costs of the five tariff bands
Source: Communications Authority of Zambia

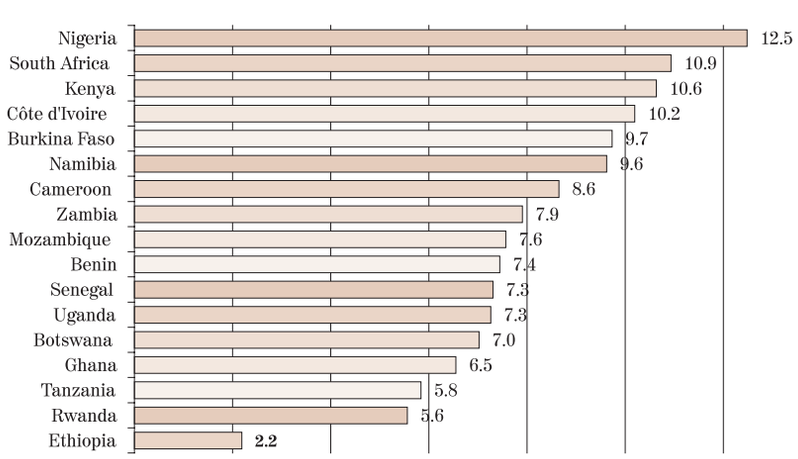
FIGURE 9: PEAK/OFF-PEAK HOURS

	Celtel	Cell Z	MTN
Peak hours	0900-2100	0700-1800	0800-2000
	Mon-Fri	Mon-Fri	Mon-Fri
Off-peak hours	2100-0900	1800-0700	2000-0800
	Mon-Fri, Sat, Sun	Mon-Fri, Sat, Sun	Mon-Fri, Sat, Sun
	Public	Public	Public

Source: Communications Authority of Zambia

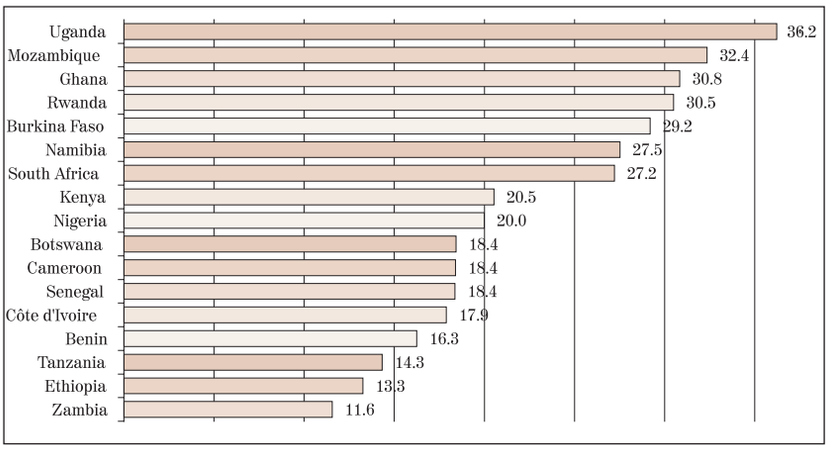
Using an OECD comparative method to establish the cost of a basket for low mobile users, (more aligned to African mobile usage than middle or high user baskets), RIA!'s comparative analysis of pricing across several African countries demonstrates that prices in Zambia are nominally lower than several countries reviewed and the lowest when adjusted for purchasing power parity, more than likely as a result of the recent competition in the sector. As outlined above, there are three major mobile cellular providers in the country, and the three providers have recently engaged in vigorous marketing strategies aimed at enhancing their market shares. This has ultimately seen the revision of their tariff structures in order to woo customers. It should also be noted that in comparison with other countries in Africa, the licensing costs are comparatively lower, giving the providers leverage to provide services at a lower cost.

FIGURE 10 (A): COMPARATIVE ASSESSMENT OF MOBILE PRICING ACROSS 17 AFRICAN COUNTRIES



There are obvious caveats to the pricing in the figure, as all markets are not evenly liberalised or tariffs rebalanced. For example, the very low prices in Ethiopia with its very low penetration rates are unlikely to reflect cost-based prices.

FIGURE 10 (B): COMPARATIVE ASSESSMENT OF MOBILE PRICING ACROSS 17 AFRICAN COUNTRIES

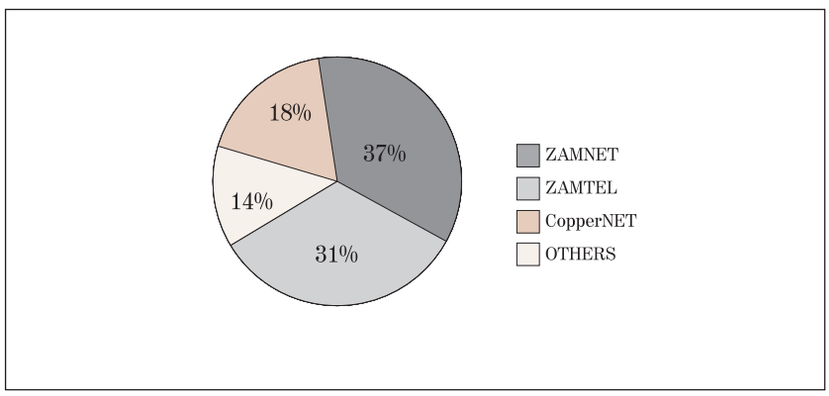


Internet Services

The first Internet service provider (ISP) in the country, ZAMNET, was established in 1994 following the enactment of the Telecommunication Act and the subsequent liberalisation of the telecommunications sector. There are currently 16 registered ISPs in the country compared to the nine recorded in 2004. Eight of these are active, namely ZAMNET, ZAMTEL, CopperNET Solutions, MicroLink, Uunet, Africonnect, Econnet and Celtel, which launched its mobile Internet access facility during the last quarter of 2006. The mobile Internet access product, the first of its kind in the country, was part of the company's US$110 million investment programme for 2006. In 2003 the total number of Internet subscribers and Internet users was reported at 12 000 and 40 000 respectively. In 2006 the CAZ estimated the total number of subscribers at 10 843. This is lower than the 12 000 reported in 2003, and it is highly likely that the figure of 12 000 (based on ITU and COMESA statistics) was an overestimate. The number of Internet users was recorded at 45 000 and 54 000 in 2005 and 2006 respectively. ZAMNET has the largest number of users estimated at 20 000 followed by ZAMTEL and Coppernet Solutions at 17 000 and 9 500 respectively.

The cost of Internet services in the country is prohibitively high. Monthly subscription fees are about ZMK250 000. The living conditions monitoring survey conducted by RIA! in 2004 shows that only 0.3% of households have Internet connections. The national ICT policy recorded the daily usage of Internet at 13%. The main users are youths, particularly college and university students. With regard to internet cafés, the TOWARDS AN AFRICA E-INDEX; HOUSEHOLD AND INDIVIDUAL SURVEY published by RIA! on ICT access and usage undertaken in 2005 reported an average cost of ZMK1 500 for 15 minutes in Lusaka and ZMK18 000 per hour in the Copperbelt.

FIGURE 11: ISP MARKET SHARE



Source: Communications Authority of Zambia

Internet services are still concentrated in urban areas, particularly in Lusaka and the Copperbelt. Penetration in the rural parts of the country requires a comprehensive, strategic and well focused approach that will address factors such as telecommunications infrastructure, training and awareness, cost of computer equipment and accessories, community participation, and incentives in major investments in rural areas. There is also the need to address other requisites for the use of ICT such as electrification of rural areas. There are efforts towards addressing some of the factors that inhibit penetration of ICT in rural areas. In 2004, the government reduced the duty on computers from 15% to 5%. This, to a large extent, reduced the cost of computers, as Zambia is highly dependent on imported computers. In 2006 the Communication Authority of Zambia reduced ISP licence fees from US$40 000 to US$20 000[3]. The licence fee of US$40 000 was clearly prohibitive to the majority of Zambians, who do not have adequate start-up capital for such ventures.

Efforts to operationalise the rural telecommunications development fund are under way. The government is pursuing a rural electrification programme primarily aimed at electrifying government institutions such as schools and clinics in rural areas, as well as poor households. According to statistics from the Ministry of Energy, in 2006 five clinics, five health centres, 35 schools, and 380 households were electrified in the rural parts of the country. This is expected to have a positive impact on utilisation of ICT in the rural areas, as electricity is one of the essentials for ICT usage. These efforts are, however, fragmented and are not likely to have an immediate impact in terms of penetration of Internet services in rural parts of the country.

3 Communications Authority of Zambia

Public Pay Phones

In the year 2000 there were 108 licensed telecentres in the country[4], increasing to 400 in 2004[5] . In 2006 the number of licensed telecentres was recorded at 500[6]. It is noteworthy that the number of telecentres has steadily increased. The incumbent national telecommunications operator, ZAMTEL, also operates a number of public access phones. The concentration of public access phones has remained in Lusaka and the Copperbelt, while most rural parts of the country have remained underserved. This can be attributed to lack of adequate ICT infrastructure to support telecentres in the rural parts of the country, coupled with low income and a high illiteracy rate in those areas. It is envisaged that the penetration of mobile phones, coupled with low cost telecommunications solutions, will attract more telecentres in rural areas. Both Celtel and MTN have introduced mobile pay boxes ideal for the rural parts of the country.

FIGURE 12. PUBLIC PAY PHONES

No of telecentres	500
Cost of local call	ZMK1 000/minute
Cost of national call	ZMK2 450/minute
Cost of international call (South Africa)	ZMK15 000 / minute
Cost of international call (United Kingdom)	ZMK18 000/minute
Cost of mobile call	ZMK2 450/minute
Telecommunications licence	1-3 rented trunk lines: ZMK500 000.00
operating fees	4-6 rented lines: ZMK750 000.00
for telecentres	7-9 rented trunk lines: ZMK1 000 000.00
per year	10 and above rented trunk lines: ZMK1 250 000.00

1US$ = ZMK4 132
Source: Communications Authority of Zambia & Telecentres

The average cost of a local call is ZMK1 000 (US$0.242) per minute while a national call is ZMK2 450 (US$ 0.593) per minute. The average cost of an international call is ZMK15 000 (US$3.630) per minute and ZMK18 000 (US$4.356) to South Africa and the United Kingdom respectively. The cost of a local mobile call is ZMK2 450 (US$0.593) per minute. The African e-index household and individual ICT access and usage survey conducted in 2005 shows that on average people spend ZMK15 746.80 (US$3.811) on public phones. Given the cost of public pay phones and the average amount spent on such services per month, it is evident that utilisation of payphones, though increasing, is still low. There is a need to promote telecentres in the rural parts of the country. This requires initiatives such as provision of ICT infrastructure, pro-rural licensing regime, promotion of community-based ICT initiatives, as well as intensifying public awareness on the use of ICT.

4 Communications Authority of Zambia
5 RIA!2005 Africa E-index ICT Access and Usage
6 Communications Authority of Zambia

Government ICT Usage

Governments are normally the major consumers of goods and services, particularly in developing countries where the private sector is less vibrant and the disposable income of the majority of the population is extremely low. Government ICT usage can, therefore, be a good indication of ICT utilisation in the country. In Zambia, the government has an estimated 8 700 personal computers[7] against a government workforce of 117 056.[8] This converts to a personal computer:staff ratio of 0.074. This is extremely low, given the potential contribution of ICT to the efficiency of any organisation. The figure also compares poorly to that obtaining in private companies where approximately 20% of staff have personal computers[9]. Out of the 8 700 personal computers only 3 567 (41%) are networked.[10] The networked personal computer:staff ratio is 0.030.

The government has a total of 11 520 KB and a monthly budget of ZMK1.35 billion[11] (US$326 718.30) for ICT usage, representing a monthly cost of ZMK11 532.90 (US$2.79) per staff member. In terms of fixed-line telephones, the government has 1 470 fixed lines.[12] This translates to telephone line:staff ratio of 0.013.

FIGURE 13. INDICATORS ON GOVERNMENT ICT USAGE

Indicator	Value
Number of personal computers	8 700
Number of Government employees	117 056
PCs / Government staff	0.074
Number of fixed lines	1470
Fixed lines/Government staff	0.013
Number of networked computers	3 567
Networked PCs/Government staff	0.030
Bandwidth	11 520 KB
Bandwidth/Government staff	0.098 KB
ICT usage costs per month	ZMK1 350 000 000
ICT usage costs/Government staff (per month)	ZMK 11 532.90

Source: Centralised Computer Services Department
Ministry of Finance and Development Planning
Zambia Telecommunications Limited
1 US$ = ZMK4 132

The government has in recent years embarked on a vigorous computerisation programme. The main objective of the programme is to institute effective controls that would minimise abuse of Government resources. It also aims at improving service delivery in sectors such as Health, Edu-

7 Centralised Computer Services
8 Formal Sector Employment and Earnings Inquiry Report 2006, Central Statistics Office
9 Computer Society of Zambia
10 Centralised Computer Services
11 Ministry of Finance and Development Planning
12 Zambia Telecommunications Limited (ZAMTEL)

cation, Agriculture, Tourism, etc. Some of the projects being undertaken in line with the above objectives are the Integrated Management Information System (IMIS) and Telemedicine under the ministries of Finance and Development Planning and Health respectively. IMIS is aimed at improving controls on Government resources whilst Telemedicine is aimed at improving remote diagnosis and treatment. This is important in Zambia where the patient:doctor ratio is extremely poor, particularly in rural areas where doctors are almost non-existent. The government is also promoting a curriculum that includes ICT in schools. This is one of the major elements in its five-year strategic plan started in 2003, aimed at introducing ICT to citizens at an early stage and thereby increasing awareness and utilisation of ICT.

The national ICT policy was approved in November 2006 and subsequently, during the first quarter of 2007, the challenges in the government usage of ICT were identified as follows:

inadequate and fragmented ICT infrastructure and connectivity within the public sector;
lack of supportive institutional framework to coordinate and promote E-governance development;
inadequate manpower in the area of IT in the public sector; and
concern about security of information as well as inadequate mechanisms for information flow within the public sector.

In order to address the above challenges, the government needs to come up with a comprehensive ICT implementation mechanism and move from mere rhetoric towards implementation of some of the elements identified in the national ICT policy and other documents.

Broadcasting

Since independence, Zambia has had only one state-owned broadcasting institution, the Zambia National Broadcasting Services (ZNBS),. that provides both television and radio services. In 1994 broadcasting services were liberalised through the enactment of the Telecommunications Act, resulting in an emergence of several television and radio stations.. The Act was amended in 2002 to provide for the creation of the Independent Broadcasting Authority (IBA) to regulate the sector. Currently there are four broadcasting stations, namely Zambia National Broadcasting Corporation (ZNBC), Trinity Broadcasting Network (TBN), Movie TV, and Mobi TV. ZNBC is state-owned while the rest are private stations. The number of radio stations is estimated at 18, which includes community radio stations, whose coverage is limited to a specified target community.

FIGURE 14. INDICATORS ON BROADCASTING SERVICES

National television stations	1
Number of pay televisions providers	3
Percentage of households with a radio	54.4%
Percentage of households with a television	27.1%
Percentage of households with Internet connection	0.3%
Percentage of households with satellite dish/decoder	1.6
Number of satellite subscribers	33 770

Source: Living Conditions Monitoring Survey Report, 2004: CSO

Broadband Services

The incumbent telecommunications operator, ZAMTEL, provides leased lines for broadband services. This facility has, however, mostly remained in the business domain due to cost. Furthermore, this service is also affected by the now inherent problems associated with fixed lines,such as long waiting periods. Most of the Internet Service Providers in the country offer broadband-based services, most of which are based on wireless technology. Large corporate environments as well as small and medium enterprises are increasingly utilising these solutions. Low-cost broadband solutions have also emerged and are employed by individual households. Most of the Internet cafés in the country are also employing broadband solutions that are inherently faster, more reliable and therefore provide a better service to customers. The fact that there are many Internet cafés operating in the country has increased competition, and Internet café operators need to provide good service, including high access speeds, in order to compete favourably and retain their client base. The leading Internet service provider, ZAMNET, offers a 2.4 GHz broadband service. The company is in the process of deploying a 2.6 GHz broadband utilising Navin's (USA) Smart WIMAX technology that employs a "Non-Line-of-Sight Wireless" solution. The costs of ZAMNET broadband services are shown in the Figure below:

FIGURE 15. COST OF BROADBAND SERVICES (EXCL. VAT): ZAMNET

Service description	Monthly subscription	Recommended no of users	Speed
Home user	ZMK326 000.00	Single home user	512 KBps
Single business user wireless Internet access	ZMK510 000.00	Single corporate user	512 KBps
Small office home user	ZMK817 000.00	2-4 users	512 KBps
Small enterprise user	ZMK1 296 000.00	5-8 users	512 KBps
Small to medium enterprise user	ZMK1 864 000.00	9-15 users	512 KBps

1US$ = ZMK4 132
Source: ZAMNET Communications Company Limited

CopperNET Solutions, another ISP in the country, also provides large bandwidth high-speed services to customers with analogue leased lines, Digital Subscriber Lines (xDSL) or VSAT connections. The costs of broadband services for CopperNET solutions are shown in the Figure below.

FIGURE 16. COST OF BROADBAND SERVICES: COPPERNET SOLUTIONS

Name of Service	Installation Charge	Monthly subscription	Speed
Gold-32 ®	ZMK3 145 986.00	ZMK2 327 654.43	32 KBps
Gold-64 ®	ZMK3 145 986.00	ZMK4 481 781.00	64 KBps
Gold-128 ®	ZMK3 145 986.00	ZMK8 077 978.00	128 KBps
Gold-256 ®	ZMK3 145 986.00	ZMK12 062 814.00	256 KBps
VPV-32®	ZMK3 145 986.00	ZMK1 789 116.50	32 KBps
VPV-64®	ZMK3 145 986.00	ZMK1 866 204.50	64 KBps
VPV-128®	ZMK3 145 986.00	ZMK5 092 063.50	128 KBps

Source: CopperNET Solutions
1US$ = ZMK4,132

The two ISPs provide an insight into the cost of broadband solutions in the country. For now the costs are prohibitive, particularly to individuals and small and medium size enterprises. However, given the low penetration rate of fixed telephony and the inherently low speed of dial-up connections, coupled with the emergence of low-cost broadband technologies, broadband solutions are expected to dominate the Zambian market soon. This is manifested in the current trend where most new ISPs offer only broadband solutions.

Private Data Networks (PDN)

The licensing framework in the country allows companies and individuals to set up Private Data Networks (PDN). This provision has been well utilised by the financial sector. Most financial institutions have set up PDN connecting their various branches in and outside the country using VSAT technology. This has facilitated such services as international credit/debit cards and Internet banking, thereby improving service delivery. The number of licences for Virtual Private Networks (VPNs) increased from one in 1996 to 15 in 2004.[13]

E-Commerce

There are developments towards e-commerce, particularly in the private sector. As indicated above, some banks have developed private networks that enable them to undertake transactions electronically. However, the growth of e-commerce is inhibited by inadequate ICT infrastructure that is the cornerstone for effective e-commerce. E-commerce also requires an appropriate legal framework. Adequate security programmes, as well as policies and laws that would prevent or mitigate any abuse of such systems, are mandatory.

13 National Information and Communications Technology Policy

Conclusion and Recommendations

PENETRATION

Notwithstanding the remarkable increase in the number of mobile cellular phone subscribers, mobile penetration has mainly been centred in urban areas. It should nonetheless be acknowledged that efforts are currently under way by both mobile cellular phone providers and ZAMTEL to extend their services to rural areas. However, penetration of telecommunications services to rural and underserved areas still remains one of the challenges in the sector. There is a need to promote universal access to ICT services by extending the same to rural and underserved areas. In this regard, there is need to operationalise the rural telecommunications development fund, institute a pro-rural licensing and investment regime (such as duty exemptions on equipment and accessories deployed in rural areas thereby attracting investment and reducing the cost of ICT services) as well as promote awareness and community-based ICT initiatives. The provision of supporting infrastructure such as electrification of rural areas is urgently required, as this is a prime requisite for the implementation of ICT policies.

AFFORDABILITY

Each mobile cellular service provider currently has its own network infrastructure. This, to a large extent, has an effect on the cost of the services provided, as capital investments are invariably high. Such costs can be reduced if service providers share their network infrastructure. This could subsequently reduce their investment in the network infrastructure and ultimately reduce their tariffs. There is also the need to legalise Voice over Internet Protocol (VoIP), as this is a cost-effective technology likely to bring down telecommunications cost in the country. This is in line with one of the major objectives of the Telecommunications Regulators' Association of Southern Africa (TRASA), namely to promote the establishment and operation of efficient, adequate, and cost-effective telecommunications and network services in the Southern African region that meet the diverse needs of customers while being economically sustainable. There is also a need to establish fair and effective interconnection regimes.

REGULATORY ENVIRONMENT

The general trend is that most users perceive the regulatory environment as highly ineffective. The Communications Authority of Zambia has embarked on a campaign through the use of posters to educate users on the role of the communications authority and the rights of those users. This is a positive step, given the fact that most users of telecommunication services are not aware of the role of the communications authority, their rights, or the obligations of telecommunications service providers. There is also a need to establish the Telecommunications Users Advisory

Committee as provided for under Section 9 of the Telecommunications Act Chapter 469 of the Laws of Zambia. The principal function of the Committee would be to consider complaints and comments from users of telecommunications services. The above measures are likely to contribute to an effective telecommunications regulatory environment, as the users of telecommunications services will, in particular, be in a stronger position to identify bottlenecks and advocate regulations and policies that would foster an effective telecommunications regulatory environment. The above position is buttressed by the current vigorous competition amongst the three mobile cellular service providers. Each provider endeavours to increase its market share. This inherently requires an effective regulatory authority and legal regime that adequately and effectively addresses issues such as anti-competitive practices.

POLICY FRAMEWORK

The Telecommunications Act Chapter 469 of the Laws of Zambia regulates the telecommunications sector through the establishment of the Communications Authority of Zambia (CAZ). The powers and functions of the Authority are exercised and performed by a Board of Regulators appointed by the minister responsible for communications and transport. The incumbent National Telecommunications Operator is also a board member. There is a need to reconsider the issue of composition and appointment of members of the board so that all the market players, particularly mobile cellular phone providers and users, are adequately represented and protected.

NATIONAL ICT POLICY

The national ICT policy was approved in November 2006 and launched during the first quarter of 2007. It is envisaged that the policy will provide policy direction and drive the development of ICT in the country. This, will, however require that the government establishes an appropriate and effective mechanism to facilitate steering the policy from mere rhetoric to actual practical implementation. There is, therefore, the need to formulate a comprehensive and practical national ICT implementation strategy based on the recently approved national ICT policy. Furthermore, there is a need to undertake the actual implementation as soon as possible while the momentum built up during the formulation and launch of the policy still exists.

UTILISATION OF ICT BY GOVERNMENT

ICT usage by government is comparatively low. Efforts are currently under way to intensify the use of ICT through initiatives such as the Integrated Financial Management Information System. With increased donor pressure on accountability and transparency, it is envisaged that the government will enhance the use of ICT as a means to promote accountability and transparency in its operations. The government

should further devise a comprehensive strategy that promotes synergy and makes ICT one of the priorities in its development agenda.

CONVERGENCE OF REGULATORY FUNCTIONS

Currently, electronic content can be carried irrespective of the underlying technology, whether through radio/television or telecommunications transmission networks. This presents a challenge to the regulatory framework. There is a need for a licensing regime that takes into account this converging technology. It is therefore important to integrate the functions of the Communications Authority of Zambia and the Independent Broadcasting Authority with the converging telecommunications and broadcasting services such as Internet, radio/television and content publishing.

References

Esselaar, S Gillwald, A and Stork, C (2007) Telecommunications Sector Performance in 17 African countries: a supply side analysis of policy outcomes, LINK Centre, University of the Witwatersrand, at http://www.researchICTafrica.net

Gillwald, A (ed) 2005, Towards an African e-Index: Household Survey and individual ICT access and usage across ten countries, LINK Centre, University of the Witwatersrand, at www.researchICTafrica.net

Research in ICT in Africa! (RIA!), 2004, ICT Sector Performance in Africa: A review of seven African countries at www.researchICTafrica.net

Republic of Zambia (2005), National ICT Policy, www.coppernet.zm/ictpolicy Ministry of Communications and Transport.

Republic of Zambia (2005) Zambia in Figures 2003/2004, Central Statistics Office (www.zamstats.gov.zm)

Selected Social-Economic Indicators 2003-2004, Central Statistics Office, Republic of Zambia

Republic of Zambia.(2006) Formal Sector Employment and Earnings Inquiry Report 2006, Central Statistics Office,

Republic of Zambia, (1994) The Telecommunications Act Chapter 469 of the laws of Zambia

Republic of Zambia (1994) The Radio Communications Act Chapter 169 of the laws of Zambia, Act No. 25

Republic of Zambia (2007) Budget Speech, Minister of Finance and Development Planning of the Republic of Zambia

Appendix

General Overview

The figure below gives a general overview of the telecommunications environment in the country:

FIGURE 17. OVERVIEW OF THE TELECOMMUNICATIONS ENVIRONMENT

Population size (source)	11 256 608
Country size	752 614 sq. km.
GDP per capital (source)	US$584.25 (Central Statistics Office (CSO) – 2000 Population Projection Report : Zambia in Figures 2003/2004
Growth Rate (2006)	5.8
Urbanisation level (source)	54.07 % Central Statistics Office (CSO) – 2000 Popula tion Projection Report : Zambia in Figures 2003/2004
Foreign ownership restrictions/percentage (source)	For Mobile: Should sell 10 % on Stock Market to the public (Communications Authority of Zambia)
Number of fixed national operators	1 : Zambia Telecommunications Company Limited (ZAMTEL)
Incumbent privatised & share still held by Government	Not privatised
Number of regional operators	None
Number of mobile operators	3 (MTN, CelTel and CelZ)
Number of ISPs	16 (Source: Communications Authority of Zambia)
Responsibility for telecommunications policy	Government through Ministry of Communications and Transport
Name of Regulator	Communications Authority of Zambia
Appointment of the regulator	Government appoints the regulator
How is the regulator funded	Fees levied to licensees
To whom does the regulator report	Government (Ministry of Communications and Transport)
Arears of responsibility for the regulator	Telecommunications
Regional association	ARICEA, TRASA
Availability of Universal service/fund	Yes- Rural Telecommunications Development: Not fully operational
Calling and issuing of all licences	The Regulator calls for applications and issues all licences
Regulation of interconnections	The Regulator has the power to regulate interconnection
Regulation of Tariffs	Operators propose tariffs and present the same to the Communications Authority for advice.
Regulation of spectrum	The Regulator has the power to regulate the spectrum
Number of fixed-line subscribers	92 941: Communications Authority of Zambia
Number of Internet users/	10 843 (Internet subscribers: Communications Authority

subscribers source	of Zambia)
Teledensity: fixed telephony	0.83
Number of mobile subscribers	1 438 491 (Ministry of Communications and Transport)
Teledensity: mobile telephony	10.26
Number of PCs owned by Government	8 700
PCs / Government staff	0.074

For further information see http://link.wits.ac.za
Tel: +27 11 7173913
Fax: +27 11 7173910
LINK Centre
Graduate School of Public Development Management
Witwatersrand University
Johannesburg
Box 601, Wits, 2050
http://link.wits.ac.za

This Policy Research Paper Series is made possible through the support of the International Development Research Centre (IDRC)