

FOREWORD

While there is increasing recognition — in continent-wide initiatives such as the New Partnership for Africa's Development (NEPAD) and the African Telecommunication Union (ATU) — of the potential of ICTs to accelerate broad-based growth and sustainable development, the vast majority of African countries lack the financial and human capital, together with the policies and institutions, to harness the potential benefits of the knowledge economy.

The research critical to transforming this negative situation is at present limited, fragmented and typically undertaken as isolated and disconnected projects — providing little foundation for informed policy formulation, effective regulation and rigorous education and training.

Most of the understanding of the information age comes from theory and experiences in the developed world. Africa produces little by way of independent primary research to inform ICT policy formulation and strategy. Unlike other parts of the world committed to participatory policy formulation processes, there are few independent agencies contributing to these processes in the broader public interest on the basis of rigorous applied research.

Research is critical to establishing the needs of countries and of particular groups within them, and to developing approaches that are likely to be effective in resolving country-specific problems. Strengthening institutional capacity for research, analysis and debate in developing countries is an indispensable element in the construction of knowledge societies. It was in this context that Research ICT Africa! — an initiative of the Learning Information Networking and Knowledge (LINK) Centre at the University of the Witwatersrand in South Africa — was created.

RIA! is an ICT policy and regulatory resource base for decision-makers in the public and private sectors and civil society, developing public-interest research findings through the networking of researchers at African universities. Built through the development of collaborative relationships among African institutions in Botswana, Cameroon, Ethiopia, Kenya, Mozambique, Namibia, Nigeria, Rwanda, Tanzania, Uganda, Zambia and South Africa, the network has linked with prestigious international research networks, such as LIRNE.NET, to create rigorous and independent research in the public domain.

It is the network's intention to expand policy-making capacity, and to broaden the policy-making horizon, in African countries, by introducing innovative concepts and approaches, and by stimulating dialogue on the basis of rigorous research. To this end, the research network, with a current membership from 12 countries, seeks:

- o to stimulate and support the conducting, co-ordination and dissemination of ICT policy and regulatory research at African research centres;
- o to create a virtual repository of information and analysis;
- o to build the research capacity on the continent, in order to generate the body of indigenous knowledge required for effective and appropriate policy formulation; and
- o to provide a research base for establishment of the specialised ICT programmes at post-graduate level that are crucial to the development of knowledge societies.

The country "performance reviews" summarised in this volume were conducted in 2003 by the initial members of the Research ICT Africa! network. The studies seek to assess the performance of the countries' telecommunications sectors — and reform strategies adopted — against their respective national objectives.

These studies are the first contribution by network members to the realisation of the RIA! vision — our vision of a ubiquitous African information society and knowledge economy, actively shared in by all.

March 2004

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African ICT baseline studies for a regenerating continent

Alison Gillwald

Director, Research ICT Africa!

Communication has been radically transformed across the continent over the last five years by the extraordinary take-up of mobile telephony and Internet services, made possible by new technological developments and market reform. While Africa continues to lag behind the rest of the world, the average continental teledensity has risen from a mere 0.01percent in 1995 — before the large-scale introduction of mobile — to 0.05percent in 2003 (ITU Access Index, 2003).

Development of the ICT sector, however, continues to be highly uneven within countries and across the continent, as the case studies in this volume reveal. What these studies also demonstrate is the data vacuum that exists on the continent, with several countries unable to provide some of even the most basic ICT statistics, even in the international reporting annals such as the International Telecommunication Union World Development Report indicators.

Where indicators do exist they are often not appropriate to a developing country context, or prioritise measurements that are perhaps more pertinent to mature economies. Raw figures demonstrating increases in the number of telecommunications lines can be misleading, for example, and should also not be directly

equated with increased access. Although research in this area is still lacking, experience tells us that many high-end homes are likely to have multiple phones — at least one fixed-line, sometimes an additional Internet line, and at least one or two mobile phones — whereas at the other end of the market, a single phone line may provide access to several house-

holds and individuals. In addition, as in the case of South Africa, the number of fixed-lines can be highly skewed towards business as opposed to residential use.

The euphoria around the communication opportunities created by new services — and the willingness of Africans to pay for and utilise them — obscures the fact that a number of significant policy objectives are not being met, and the fact that certain unintended consequences of reform need to be cautioned against.

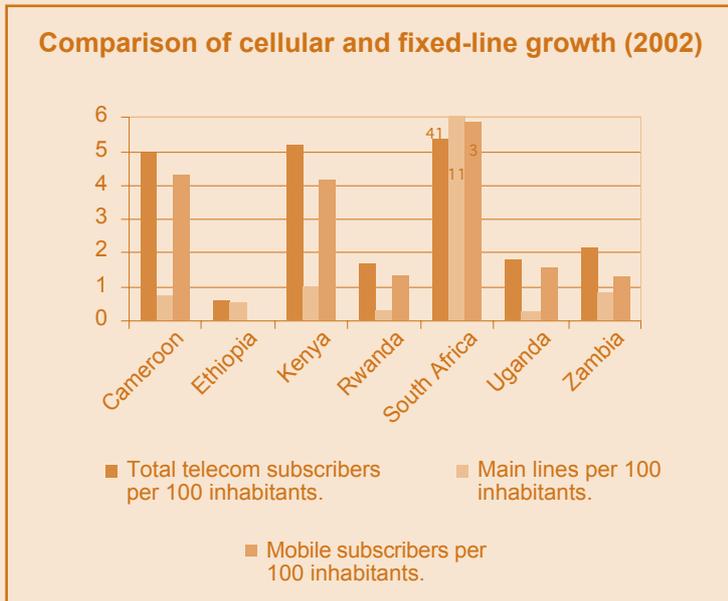
Performance Review

The country studies in this volume seek to review the performance of the countries' telecommunications sectors at the national level against their stated policy objectives and strategies. The ultimate aim is to determine which reform strategies are contributing positively to the realisation of development objectives, and which ones appear to be failing. The primary objective of all countries studied is the improvement of access to telephony services, usually with commitment not only to network extension but also modernisation of the network in order to meet the needs of a modern economy. While one should be careful in drawing conclusions from the limited data available, the value of such early studies, as prototype studies, is in identifying initial developments, in beginning the establishment and validation of data sources and methodologies, and in focussing attention and analysis on developments that require a more detailed examination of specific country circumstances. While the data discloses some differences between countries that have not yet completed their basic telecom reform process and those that have in many instances the impact of recent reform initiatives has not yet played out in the data sets available.

| Residential Telephone Tariffs adjusted for PPP | | | | | | | | | |
|--|------------|------------|---------|------------------------------------|------------|--------|---------------------------------|------------|--------|
| Residential tel connection charges | | | | Residential tel. monthly subscrip. | | | Cost of 5 hours of calls (peak) | | |
| | US\$ (PPP) | US\$ (PPP) | | US\$ (PPP) | US\$ (PPP) | | US\$ (PPP) | US\$ (PPP) | |
| Country | 2000 | 2002 | CAGR % | 2000 | 2002 | CAGR % | 2000 | 2002 | CAGR % |
| Cameroon | 121 | 121 | 0.00% | 7 | 7 | 0.00% | 16 | 16 | 0.00% |
| Ethiopia | 305 | 305 | 0.00% | 8 | 8 | 0.00% | 20 | 20 | 0.00% |
| Kenya | 77 | 77 | 0.00% | 9 | 15 | 20.10% | 12 | 19 | 17.03% |
| Rwanda | 209 | 213 | 0.68% | 7 | 14 | 25.99% | 61 | 61 | 0.00% |
| South Africa | 104 | 120 | 4.78% | 31 | 34 | 2.60% | 31 | 50 | 16.26% |
| Uganda | 576 | 373 | -13.51% | 34 | 34 | 0.00% | 76 | 127 | 18.56% |
| Zambia | 30 | 30 | 0.00% | 3 | 3 | 0.00% | 12 | 24 | 28.16% |

Source: ITU World Telecommunications Indicators 2003 and the World Bank Development Indicators 2002

In addition, other factors such as Gross Domestic Product Per Capita, or what has been referred to as the income effect, or the timing of the introduction of a service, may be stronger determinants of ICT development than other factors such as policy and regulation, the effects of which may take years to be seen in the data.



Source: ITU World Telecommunications Indicators 2003

While the opening up of the market was seen, in all countries reviewed except Ethiopia, as the mechanism to fund and deliver the extension of services, the actual philosophies and approaches have been quite different in the various countries. In Uganda, for example, the shift to private funding of infrastructure development and service delivery is explicit, with the emphasis on creating a fair competitive environment. Yet several other countries only liberalised services such as value-added network services (VANS) or Internet services, or their mobile networks, but not the Public Switched Telecommunications Network (PSTN).

Access

In almost all the countries reviewed access to telephony has increased, but this has invariably happened through the introduction of relatively high-cost mobile access rather than through the typically more affordable fixed-line services. In Cameroon, in the few years that mobile has operated, the mobile operators have overtaken the fixed-line incumbent, which now has less than a quarter the number of subscribers that the two mobile operators each have individually.

In fact, in Cameroon and all the other countries reviewed that adopted reform models that protected the PSTN with formal periods of exclusivity such as Kenya, South Africa and Zambia – with the aim of financing the extension of the network and increasing access to un-serviced areas – the number of fixed-line subscribers has declined. This is especially the case where the exclusivity period was accompanied by the expansion of a competitive mobile market beyond a duopoly – as in both Kenya and South Africa – where fixed-line subscriber numbers have fallen by 0.61percent and 10percent respectively over the period of the exclusivity. As was intended but not achieved in Kenya, the exclusivity period in South Africa was linked to the partial privatisation of the incumbent. In both South Africa and Kenya, there have been dramatic local-call tariff price increases, even beyond the levels required by rate re-balancing. These price hikes have been mirrored by fixed-line disconnections. In Kenya, the peak of 300,000-odd fixed-line subscribers is diminishing as mobile tops the 2-million-subscriber mark. A similar pattern is emerging in Cameroon, with a reduction in revenues for the incumbent of over 40 percent in three years. This stagnation within the fixed-line incumbent has impacted negatively on the prospects for privatisation in both Cameroon and Kenya. South Africa’s reduction in fixed-lines, on the other hand, has been accompanied by continued profitability for the partially-privatised incumbent, which has been investing less in network roll-out since the end of the formal exclusivity period, and focussing increasingly on the lucrative business market.

Pricing

Irrespective of the reform model, in most African countries the price of access remains extraordinarily high, with communications costs as high as 36percent of per capita income in the countries reviewed – as compared with Northern hemisphere averages of 3-5 percent of per capita income. These costs impact particularly on Internet access, which is not yet cost-efficiently available on mobile networks. Countries with the lowest Internet penetration, and usually the highest Internet costs, are those where the incumbent is the exclusive provider of Internet, such as in Cameroon and Rwanda. In such countries, Internet cafes tend to proliferate, as people share the costs of meeting their communication needs through collective access points. In Cameroon, it is estimated that there are over 450 cyber cafes, mostly in the major centres.

High prices, and their negative impact on access and penetration, tend to reflect the weak regulatory regimes in most of the countries reviewed, and more generally across the continent. Despite legislation – in some cases introduced nearly a decade ago – separating the regulator from the incumbent operator and relevant government ministry, there is often not the political will to see the regulatory agency effectively regulate the mostly-state-owned incumbent, which invariably commands far more

authority and political respect than the regulator. Even where the regulator has formal powers to regulate the incumbent, its ability to do so is hampered either by a shortage of human or financial capital, or by systems of political patronage and influence. This lack of effective governance of the sector has had severe implications in many countries, harming their ability to attract investment for their privatisation or liberalisation endeavours. Both Kenya and Zambia were unable to proceed with their privatisation initiatives at least partially because of

the weak regulatory environment in those countries. With the political changes that have taken place in Kenya over the last year, the regulator has taken a number of bold actions that indicate its desire to be viewed more credibly by stakeholders. However, the results of these changes will take time to reflect in research such as that summarised in this volume, which is looking at longer-term impacts.

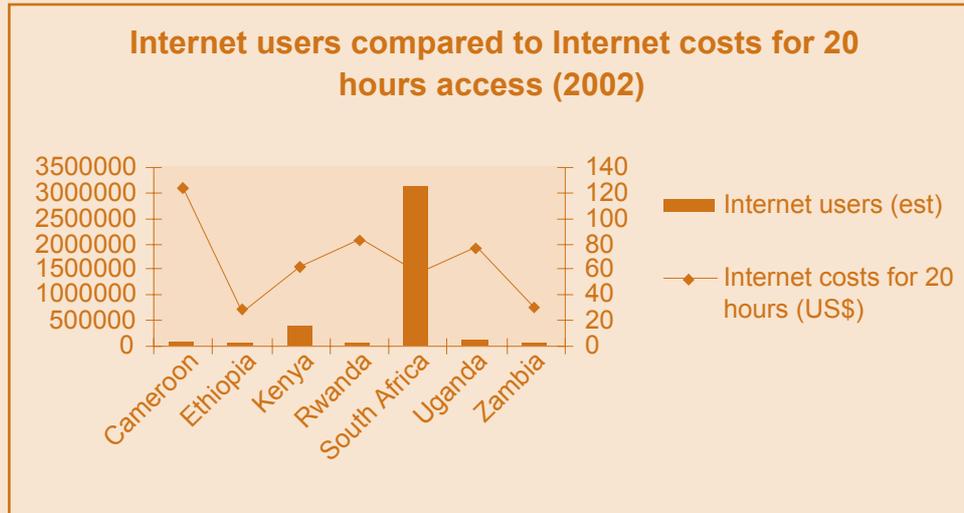
Those regulatory regimes that have proven effective have sometimes achieved their successes as a result of being neglected or ignored by central government, or through fortuitous timing. Uganda's regulator, for example, has emerged as a well-resourced, autonomous body, at least partially because mechanisms were not put in place to provide for its funding or accountability. The regulator set about resourcing itself through levies on the sector, which allowed it to attract and train personnel who could competently deliver on the regulator's legislated mandate. Even the critical sequencing of the introduction of competition in both the fixed and mobile services markets was the result of a fortunate error of timing in Uganda. There are, nevertheless, important lessons to be drawn from Uganda's experience for others seeking to reform their markets. The simultaneous introduction of competition in fixed and mobile in Uganda has seen the benefits of competition — even if only in the form of a duopoly — particularly with regard to pricing and the creation of a growth path for two companies in the converged fixed and mobile environment. Although it is difficult to quantify the benefits at this stage, Uganda is viewed as a forward-looking country, attractive to donors and investors as a regime on which to expend resources. A major critique of Uganda's policy, however — as identified in the country report — is the failure to set targets for many of the national objectives. Also, the policy has tended to be more focussed on infrastructure development than on determining the development impact of ICT initiatives. This is true of policies in many of the countries reviewed in this volume.

International connectivity

The issue of international gateways is particularly important for those countries which are "e-landlocked" and not able to benefit from direct access to the high-bandwidth undersea cable that runs up the western seaboard of the continent from Southern Africa. Despite the Ugandan regulator acting proactively to exploit loopholes that allowed it to license several international gateways in the country, the costs of international service remain sufficiently high to have impacted negatively on consumers and inhibited international investment, not only in operators or service providers but also in the economy more broadly (and call centres in particular).

As the undersea cable does not extend up the eastern seaboard of the continent, Kenya suffers from the same physical constraints of lack of cost-effective connectivity. This negative situation has been exacerbated by the international gateway exclusivity granted to Kenya's incumbent PSTN. The high cost of international calls has resulted in a dramatic shift in international traffic, with a diminishing amount of outgoing traffic and a dramatic increase in incoming calls, with associated losses of revenue for the country.

As another landlocked country without direct access to the undersea cable, Zambia has not had the benefit of a Uganda-style enabling policy or proactive regulator, and, like Kenya, has a single international gateway provided by the incumbent. Despite being one of the earliest countries to set up a sector regulator and a competition commission, Zambia has been unable to establish a fair competitive environment. While the market has grown significantly from ZMK5 billion in 1993 to ZMK200 billion, there has been little penetration in the rural areas. The growth has largely been in



Source: ITC World Telecommunications Indicators 2003 & FAIR report 2003

the mobile segment of the market, which has prices beyond the means of most Zambians. The fixed-line teledensity is just under 1 percent, with mobile subscriber numbers approaching double the 140,000 fixed-line total. While the introduction of competition to the incumbent-owned mobile network Telecel — first from Celtel and later Cell Z — has had the anticipated positive effect on prices, with activation costs dropping by 60 percent, anti-competitive pricing has resulted in Telecel undercutting prices to far below cost, with little intervention from the Zambian Communications Commission or Competition Board. The weak Zambian regulatory regime has been identified as one of the factors contributing to the government's inability to privatise the incumbent PSTN. This, together with high license fees, has impacted on the emergence and sustainability of ISPs and the penetration of the Internet. Like other jurisdictions protecting the rights and revenue streams of incumbents — such as Cameroon, Ethiopia, Rwanda and South Africa — Zambia also does not permit the deployment of cost-effective technologies such as Voice over IP (VoIP) outside the incumbent.

Monopoly

Ethiopia, which has seen some institutional reform since a 1996 law separated operations from regulation — through the creation of the Ethiopian Telecommunications Company and Ethiopian Telecommunications Agency — provides one of the purest examples of state-provisioning, with a strict monopoly on fixed, cellular, Internet services and international gateways. Despite its potential with a population of over 70 million, this has resulted in low network development, long waiting lists representing up to 84.8percent of available capacity, fixed phone teledensity of only 0.6percent, an increasing number of pirate operators, one of the lowest Internet penetration levels in the world at 0.0001percent and arbitrary and artificial pricing. With call charges set by the incumbent, with minimum reference to the regulator, having been kept artificially low, the rate of Internet growth, off a very low base, has been dramatic. However, with telecommunications investment at less than 0.5percent per capita on average per annum, fixed-phone teledensity stands at only 0.6percent, Internet growth will ultimately be constrained.

With a regulatory agency that lacks both political independence and human and financial resources, the likelihood of Ethiopia's monopoly PSTN being regulated to more effectively meet national needs seems remote. Unlike Uganda, where the loss-earning incumbent was viewed as a yoke around the government's neck that had to be got rid of, the incumbent in Ethiopia is one of the few revenue streams for the government, which remains unconvinced that privatisation will sufficiently compensate it for any loss of income. For the same reason, the Ethiopian government, like other governments that have pursued monopoly models, remains unconvinced of the benefits of liberalisation. Also, like elsewhere on the continent, no research has been done to demonstrate the potential of increased participation in the sector — not only in terms of consumer and user benefits but also in terms of the potential positive fiscal impact profitable enterprises can have.

The remarkable success of mobile on the continent provides a case in point for the study of the fiscal impacts and multiplier effect of new communications enterprises. At the same time that fixed-line subscriptions were stagnating, those countries that introduced competitive mobile services saw a dramatic take-up of services, despite the invariably high charges. In all countries studied, mobile has outstripped fixed services. In several countries, however, the services are largely confined to the major centres, tourism routes (as in Kenya) or, in the case of Zambia, the rail-line between the Copperbelt and Lusaka. In South Africa however, with generally higher levels of urbanisation than the other African countries reviewed, over 80percent of the population is covered.

Interconnection

The greatest challenge to the successful creation of a competitive environment and successful entry of new operators is the new entrants' ability to interconnect with other operators — particularly the incumbent — quickly and at a fair price. Every country reviewed has been beset by the inevitable problem of interconnection. In some countries such as Cameroon, failure to interconnect has resulted in customers carrying several SIM cards which are used interchangeably to reach colleagues and families on different lines to avoid exorbitant termination fees on different networks.

Generally, the problems around interconnection are caused by incumbents not used to competing or being regulated. In South Africa, despite a relatively sophisticated interconnection and facilities-leasing framework, the principle (drawn from international best practice) that new entrants or competitors, required by law to acquire their facilities from the incumbent, enter into commercial agreements prior to regulatory intervention has resulted in protracted negotiations, competition disputes and lengthy legal reviews. Generally, incumbents have the financial resources to draw out negotiations so that new entrants are forced into agreement or forced out of business. Or incumbents can use their superior resources to tie up the regulator in the courts for years on end, challenging what they regard as unfavourable regulatory intervention, as has been the case in South Africa. In fact, in South Africa, it was a complaint brought by the VANS providers — including Internet Service Providers — to the

Competition Commission that resulted in the Commission recommending to the Competition Tribunal that the incumbent be fined 10 percent of total annual earnings for competition breaches.

Regulatory capacity

The issue of interconnection highlights the need for appropriate regulatory models for developing countries, where regulators often have restricted human and financial resources. Access regulation has developed globally in response to the emergence of a competitive environment, but under the highly imperfect market conditions that exist in many developing nations — where one continues to have legacies of the “natural monopoly” — this form of regulation is overly resource-intensive and complex. This type of regulation requires ample resources and political power in order to implement the complex costing models and administrative procedures required to check the behaviour of the incumbent. Often the incumbent’s position is inherently anti-competitive, either because of the vertically-integrated market structure that invariably exists or because of formal protection of certain of its activities.

What emerges starkly from the different country studies is the pattern of political, social and economic legacies that determine the ability of a country to respond to the challenges of globalisation and, in particular, the digital divide. Each study unveils the country’s unique history, illustrating the fact that while facing the already-stark global challenges of new technologies and liberalisation trends, each country has, in addition, to confront the impact of its own history — apartheid in South Africa, genocide in Rwanda, years of civil war in Ethiopia, violent dissent in the north of Uganda, strong neo-colonial influences in Cameroon, and the collapse of the ‘mono-crop’ copper economy in Zambia.

The only response can be the development of smarter, more appropriate policies to overcome these legacies. These smarter approaches cannot be achieved without data, analysis and research to inform decision-making, together with honest sharing of experiences between developing countries in order to identify what appear to be the effective strategies to achieve shared objectives, and what appear to be the failures. The defense of policies and strategies on the basis of national pride or political posturing in the face of evidence to the contrary — and in the face of people’s everyday experiences of failure — will not serve a country or the continent well. For countries to shift from being mere donor recipients to being innovative problem-solvers, the continent’s intellectual capital must not be shunned or made to find a home on foreign shores. The human capital must be embraced, critically engaged, and deployed to overcome unwanted legacies.

Cameroon

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The 1990s have seen tremendous changes in telecommunications markets in Africa. The rapid changes in technology, the poor performance of the incumbent providers, and pressure from international organisations have forced most African countries on a particular path: ending state monopolies through privatisation of state-owned telecommunications providers, opening up of portions of their telecommunications markets to competition, and introducing regulatory institutions.

In Cameroon, an attempt to make this shift occurred in 1998, after years of resistance to such requirements in terms of the Structural Adjustment reform policies imposed on the country by the World Bank and the International Monetary Fund (IMF).

The telecommunications sector was partially liberalised in 1998, with the decision to open up the mobile cellular market to competition. The fixed-line monopoly was to remain with the incumbent CAMTEL until 2004, during which time a privatisation stake was to be sold. The Telecommunications Regulatory Agency (ART) was also established in 1998.

A Mobile 'Boom' & Fixed-Line Stagnation

The partial opening up of the Cameroon market to competition has dramatically changed the landscape of mobile telecommunications.

| Cameroon | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | no data | no data | no data |
| Total telecom revenue per capita (US\$) | 15.07 | 18.19 | 24.72 |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 10.97% | 10.50% | 11.36% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.9811 | 2.0110 | 4.2683 |
| Cellular subscribers per capita | 0.0098 | 0.0201 | 0.0427 |
| Internet users per capita | 0.0027 | 0.0029 | 0.0038 |
| Main lines per capita | 0.0063 | 0.0069 | 0.0070 |
| %age cellular revenue to total telecoms revenue | 26.9% | 61.9% | 59.6% |
| Total telephone subscribers per 100 inhabitants | 1.61 | 2.70 | 4.97 |
| Total telecom revenue as % of GDP | 2.5% | 2.9% | no data |
| Waiting list for main lines | no data | no data | no data |
| Total telecom revenues per subscriber (US\$) | 935 | 674 | 497 |
| Main line telecom revenues per subscriber (US\$) | no data | no data | no data |
| Cellular revenues per subscriber (US\$) | 413 | 560 | 345 |

Source: ITU World Telecommunications Indicators 2003

The incumbent CAMTEL was the first African operator to adopt the GSM mobile cellular system in the 1990s, but it had not been able to raise its mobile customer base beyond 5,000 users (out of a 70,000-subscriber mobile capacity). The incumbent sold off its mobile operations to South Africa's MTN in 1999. In the same year, a second mobile operating license was issued to France's Mobilis (now called Orange).

In less than five years, the number of mobile subscribers has increased more than 2,000 percent, to reach close to 1 million users between the two

operators by the end of 2003. Orange's 520,000 subscribers represent 52 percent of the mobile market, with MTN steadily gaining and standing at 475,000 in September 2003. With a remaining available capacity of 550,000 lines, MTN is expected to exceed 1 million subscribers by the end of 2004.

In the meantime, the number of fixed-line subscribers has declined and stagnated at around 95,000 users — far below the 2003 target of 850,000 subscribers set by the incumbent CAMTEL in its 1999 performance contract. For a country of 16 million inhabitants, that makes a fixed-line teledensity of less than 0.7 percent. The waiting list for fixed-lines exceeds 1 million, and the delay in getting connected can be as long as two years.

In the Internet sector, there are eight declared Internet Providers (IP) and 42 ISPS are offering services to close to 500 cybercafes in the country and 2,552 declared subscribers.

The mobile operators, Orange and MTN, are relatively efficient, with lines-per-employee ratios of 1438 and 1498 respectively, not far off international standards. The incumbent's ratio is a disappointing 44 lines per employee.

The country's official telecommunications market has been increasing by an average of more than 30 percent per year, reaching US\$275 million in 2002 (the combined total of the three operators: CAMTEL, MTN, Orange).¹ But this growth has been entirely a function of the two mobile operators' performance, with the incumbent CAMTEL's revenues declining sharply, from US\$156 million in 2000 to US\$105 in 2002.

In an attempt to reverse its losses, CAMTEL implemented two price increases for fixed-line use, in 2002 and 2003. A public outcry followed CAMTEL's proposed 100 percent price increase in 2002, forcing the Minister of Posts and Telecommunications to step in and reduce the increase to 20 percent. In December 2003, the incumbent reduced its international call rates by 50 percent and again increased its local call rates, by another 20 percent. At the same time, the Telecommunications Regulatory Agency (ART) prevented the mobile operators from reducing their tariffs, casting doubts on the independence of the regulator and its willingness to allow a competitive market.

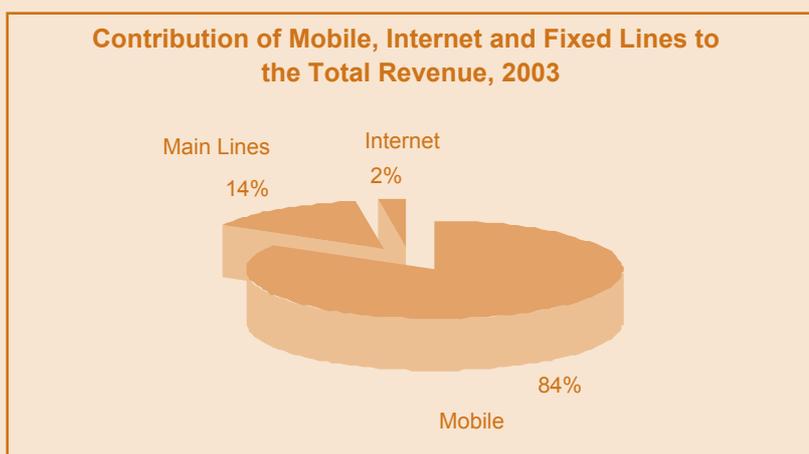
Meanwhile, the government has failed to sell a privatisation stake in the incumbent, seen by many as an illustration of the lack of willingness by the government to let go of the company, which at one point in time was considered a "hen of golden eggs," and which today is presented as a strategic political tool. The high telecommunications costs have laid fertile ground for a booming 'grey' market dominated by Voice over IP (VoIP) and VSAT satellite services.

Mobile as universal access Solution?

The surge in the mobile sector has, in a way, compensated for the disappointing performance of the incumbent. Mobile teledensity is 4 percent, compared with the fixed-line rate of 0.7 percent.

Unexpectedly, mobile services growth, whether through phone calls or SMS, is expanding universal access to basic telephony services, which originally was the duty of the incumbent CAMTEL.

The surge in the mobile market seems to have had a counter-effect on the policies of government decision-makers. There is a tendency to believe that mobile technology has become the solution for universal access. This is reflected in government infrastructure investment strategies. Investment in revamping the incumbent's infrastructure has been almost nil for the last three years. Meanwhile, the government is playing with the idea of encouraging the incumbent to jump back into the mobile market — despite the sad experience of the early 1990s when CAMTEL couldn't attract more than 5,000 mobile subscribers in more than six years of operation.



Source: Operator interview conducted during 2004

Regulation

Undoubtedly, there is a need in Cameroon to stabilise the regulatory environment, in order to provide an atmosphere conducive to investment. The country's regulatory environment faces tough challenges — most notably, a moribund 100-percent-state-owned fixed-line operator and a large, unofficial 'grey market' in Internet and VoIP.

Even with the success of the two mobile companies, the incumbent's market behaviour has not significantly changed. This puts a lot of pressure on the regulator, which still is not powerful enough to oppose many of the incumbent's moves. The long-awaited inter-ministerial body aimed at resolving the regulator's competency problems is urgently needed.

<http://www.researchictafrica.net/modules.php?op=modload&name=News&file=article&sid=373>
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¹ Rate of conversion: 1US\$ = 550 francs CFA

Ethiopia

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Telecommunications services and networks form an increasingly large part of the infrastructure, and the basis for economic and social development, of any nation. Digital technologies have now made it possible to distribute voice, data and video on the same communication channel, thus enabling us to transmit more information in each band of the frequency spectrum. The role of telecommunications is evolving along with this digitisation process and the convergence of computing, broadcasting and communications.

At a time when many developing countries began building the foundations for the knowledge society, thus ensuring considerable progress in reforming their telecommunications infrastructure, a number of developing nations in sub-Saharan Africa remained far behind, in terms of both regulation and achievement of universal access to com-

munications, information and knowledge. Notwithstanding its recent progress, Ethiopia is one of those countries whose historical, political and social progress and monopoly market structure have led to an underdeveloped telecommunications sector.

| Ethiopia | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | 0.6% | 0.7% | 0.5% |
| Total telecom revenue per capita (US\$) | 1.38 | 1.65 | 1.55 |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 29.26% | 29.60% | 29.47% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.0280 | 0.0421 | 0.0748 |
| Cellular subscribers per capita | 0.0003 | 0.0004 | 0.0007 |
| Internet users per capita | 0.0002 | 0.0004 | 0.0007 |
| Main lines per capita | 0.0037 | 0.0043 | 0.0053 |
| %age cellular revenue to total telecoms revenue | 9.4% | 11.2% | 13.0% |
| Total telephone subscribers per 100 inhabitants | 0.39 | 0.48 | 0.60 |
| Total telecom revenue as % of GDP | 1.4% | 1.7% | 1.6% |
| Waiting list for main lines | 196,883 | 155,208 | 145,938 |
| Total telecom revenues per subscriber (US\$) | 351 | 347 | 258 |
| Main line telecom revenues per subscriber (US\$) | 316 | 281 | 236 |
| Cellular revenues per subscriber (US\$) | 465 | 439 | 269 |

Source: ITU World Telecommunications Indicators 2003

Regulatory and Policy Highlights as of End of 2003

| Telecommunication services | Policy |
|--|---|
| Fixed line and mobile services | ETC is the sole provider. The private sector can only participate through partnership with ETC |
| Internet services | ETC is the sole provider of Internet service; ISPs are not allowed |
| Downstream services such as call center, cyber café and messaging services | Downstream services such as call centres, pay phones and messaging services are allowed for competition. However, there are a few legally registered downstream service providers. Cyber café service is not officially allowed but tolerated |
| Call back and other long distance services that use modern technologies | Call back or use of modern technology to divert the long distance traffic is not allowed and is punishable with fines and imprisonment. However, there are underground long distance service providers who are threatening ETC's revenue. |
| VSAT | Individuals are not allowed to own VSATs. International organizations are allowed to own VSAT with payment of traffic compensation or "landing right" fees |
| VoiP | VoiP is not allowed |
| Telecommunications equipment | Sell of mobile and telephone handsets is allowed |

Source: ETC Strategy paper 2004-2006, Council of Minister's Regulation No. 10/1996, Proclamation No. 49/1996; Proclamation No. 116/1998 and Council of Minister's Regulation 47/1999.

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Political Instability Stunts ICT Development

Ethiopia adopted telecommunications technology fairly soon after it was available to the developed world towards the end of 19th Century. However, the country's volatile political environment set its development on a different trajectory, with a range of negative social and political consequences. The political changes over the last three decades have greatly contributed to the Ethiopian state's intransigent stance on monopoly provisioning of utility services; a low level of productivity; serious under-investment; and a low level of telecommunications penetration. The negative impact of political instability cannot be over-emphasised, and is borne out in other studies that correlate political volatility and low telecommunications penetration (Boukari and Cosset, 1999).

A century later, Ethiopia's growth continues to be retarded by this legacy, with a low level of ICT development compared to its neighbours and the early adopters. The size of the Ethiopian ICT sector remains very small by all measurable indices, with some of the world's lowest levels of computer penetration, teledensity, number of hosts and Internet users. Ethiopia is one of the six countries at the bottom of the ITU Digital Accessibility Index (World Bank, 2003). The other countries at the bottom of the ICT league table are Guinea Bissau, Chad, Mali, Burkina Faso and Niger.

Progress Since 1996

However, progress has been made over the last eight years, following Proclamation 49/1996, which separated the country's policy, regulatory and operational functions in telecommunications. The promulgation of this new telecom law in 1996, which established the Ethiopian Telecommunications Agency as the sector regulator, led to improvement in fixed-line services and the introduction of new services under strict monopoly. The fixed-line telephone penetration doubled from a low base of 0.26 per 100 people in 1996 to 0.6 in 2003. Similar progress was also made in the state-owned incumbent Ethiopian Telecommunications Corporation (ETC)'s income, and tax for the government coffers. Telecom revenue doubled and telephone traffic tripled during the same period. The Internet and mobile services, also provided exclusively by the ETC, were introduced during this period and the government has shown some positive signs for liberalisation of the sector.

The mobile telephony services segment of the market is one of the fastest-growing segments of communications in Ethiopia, despite marketing, technical and network management hiccups. The number of subscribers has been doubling year-on-year ever since mobile was introduced in 1999. Although its widespread use has been hampered by the late start of the service compared to other African countries, it remains one of the most promising communication services in addressing the digital divide in Ethiopia.

In contrast, the Internet market was stifled by the underdeveloped infrastructure and unchallenged monopoly of the incumbent, ETC. The Internet service segment is one of the least developed in the world when compared to population size. Although Internet was introduced in 1996, there were only 7,709 Internet subscribers by 2002, giving a density of about one subscriber per 10,000 people. Ethiopia lagged 20 times behind the low-income countries' average and about 460 times behind the world average at the time (ITU, 2003).

The telecom market structure is designed around a solid monopoly where the incumbent continues to be guarded against competition by the central government. Although the investment code that was issued in 1998 encourages strategic partnership with foreign or domestic investors, the weak regulatory framework and uncertainty as to how to achieve partnership has left the incumbent to continue as the unchallenged driver of telecommunications development, and of the policy process. The incumbent operator now tackles most of the problems that should be handled by the regulator; delving directly into issues ranging from quality-of-service (QoS), universal access, and ICT applications for development, to advocacy for the advancement of the information society.

Meanwhile, the incumbent is failing to meet the growing demand for basic services. The number of potential customers on the waiting list, which indicates the magnitude of the demand for basic services, jumped from 139,095 in 2002 to 146,062 in 2003.

Pent-Up Demand for Mobile

The pent-up demand for mobile services is staggering. The waiting list for mobile services in a few cities like Addis Ababa and surrounding places where the service is available - Debre Zeit, Mojo and Nazreth - rose to 102,000 in 2003, slightly higher than the number of people waiting for fixed-line telephone connections in these towns. The current demand for mobile lines could be as high as five times the number on the fixed-line waiting list, if one takes the popular pre-paid service into account. Conservative estimates show that Ethiopia needs to make over 3 million mobile lines available to subscribers over the next few years. The incumbent ETC plans to raise the number of subscribers to half a million in 2004, and to achieve a mobile density of about 3percent by 2006.

With an improved regulatory and policy framework, the telecommunications sector promises great potential for contributing to the Gross Domestic Product of Ethiopia. An aggressive telecommunications sector development would not only bring a spill-over effect into other sectors, but would also be critical for participation in the information society. So far, the contribution of the telecommunications sector to the GDP has been relatively small. In 2002, the telecommunication sector contributed only 1.6percent of the GDP. A dramatic increase in the current tele-density level from 0.7percent to the NEPAD target of 5percent tele-density in the next five years would dramatically improve the industrial base and lead to a burgeoning business sector that could contribute to the overall economic growth of the nation.

Nonetheless, this requires investment, technology and skilled human resources, which in turn necessitate active private-sector participation in the delivery of communications services. The liberalisation of the sector would not only attract the necessary foreign technology, expertise and investment, but would also help to increase demand for advanced value-added network services (VANS) and improve the quality-of-service (QoS).

Gradual Introduction of Competition

The government should consider a gradual introduction of competition for the incumbent Ethiopian Telecommunications Corporation (ETC), while building the capacity of the regulator to ensure improved services and clamp down on clandestine operators in the 'grey market' that continues to threaten the revenue of the incumbent by diverting its long-distance traffic. Although the incumbent continues to argue that protection of its position is important for rolling out services to underserved areas, it will be difficult to both curtail pirates and improve services without the gradual introduction of competition. A gradual introduction of competition through regulation "can encourage investment by creating a fair competitive environment, which through the deployment of new cost-effective technologies can offer affordable services where large cumbersome incumbents have tended not to deliver²". A research capacity to analyse the development of the sector would also contribute to timely policy intervention.

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² Alison Gillwald, Research Director, LINK Centre, University of the Witwatersrand, Johannesburg, in comments on the draft, April 2004.

Kenya

Muriuki Mureithi

Summit Strategies Ltd., Nairobi

Since the launch of its telecommunications sector reform in 1999, Kenya has made great strides in the expansion of telecommunications services to “those who can afford,” but not to “those who cannot afford.” This pattern of exclusion, based on capacity to pay, risks creating an ever-widening divide.

The policy objectives have been, and continue to be, noble, but the government has failed to periodically review the policy strategy and mechanisms to align with, and take advantage of, the changing environment. Policy is, however, an ongoing process, and the next level of reform will hopefully address the inadequacies.

The Launch of Reform

The Kenyan government launched telecommunications sector reform in 1999, guided by the Kenya Communications Act of 1998, and set out some key issues to address. The national objectives of the policy were to ensure “contribution to the development of the Kenyan economy as a whole by ensuring the availability of efficient, reliable and affordable communications services throughout Kenya.” The policy framework set out the strategy and mechanisms to achieve these objectives.

It is necessary to review the progress the government has made towards achieving the policy objectives. Through desktop research, one-on-one interviews, and an examination of International Telecommunication Union (ITU) data for 2001 (the latest available ITU statistics), it has been possible to generate an evaluation of the current state of play in the telecommunications sector in Kenya, to analyse the key factors, and to point out policy issues that require serious examination.

| Kenya | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | 0.5% | 0.4% | no data |
| Total telecom revenue per capita (US\$) | 10.00 | 15.45 | no data |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 16.33% | 19.76% | 22.17% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.4154 | 1.9174 | 4.1504 |
| Cellular subscribers per capita | 0.0042 | 0.0192 | 0.0415 |
| Internet users per capita | 0.0033 | 0.0064 | 0.0125 |
| Main lines per capita | 0.0105 | 0.0104 | 0.0103 |
| %age cellular revenue to total telecoms revenue | 12.4% | 40.1% | no data |
| Total telephone subscribers per 100 inhabitants | 1.46 | 2.96 | 5.18 |
| Total telecom revenue as % of GDP | 3.0% | 4.2% | no data |
| Waiting list for main lines | 134,103 | 133,981 | no data |
| Total telecom revenues per subscriber (US\$) | 683 | 522 | no data |
| Main line telecom revenues per subscriber (US\$) | 835 | 860 | no data |
| Cellular revenues per subscriber (US\$) | 299 | 323 | no data |

Source: ITU World Telecommunications Indicators 2003

Evaluating Implementation

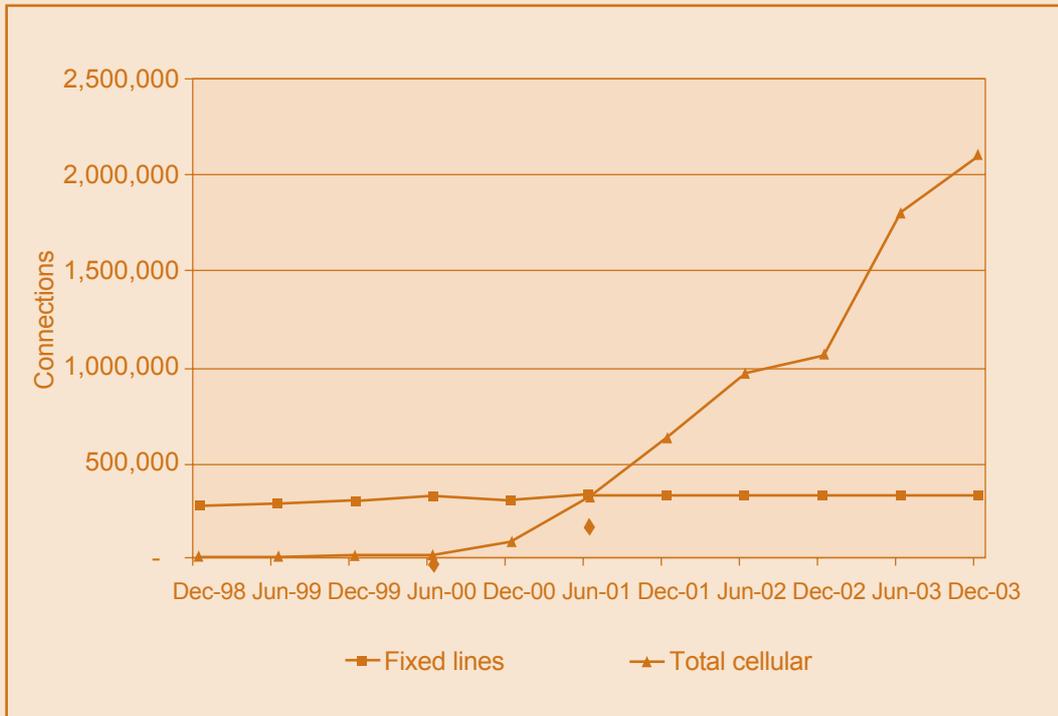
Between 1999 and 2003, the government implemented policy reforms that resulted in a number of structural changes. The main structural changes involved re-definition and clarification of roles for:

- policy-making;
- market regulation;
- dispute resolution; and
- the operation of services among multiple players.

In the operation of services, multiple operators are now competing in several market segments, based on a philosophy that allowing private-sector operation in a competitive framework will safeguard consumer interests. But significant departures from this philosophy can be found in fixed-line national and international voice services, Internet, and VSAT. The government had felt that the national interest was best secured through monopoly provision of these services by Telkom Kenya Ltd, but in 2003 licensed Gilat to operate a VSAT service, though this is not yet operational. All other services are now competitively supplied by private sector firms.

In giving the fixed-line operator, Telkom Kenya, a monopoly, the government argued that the operator needed five years to re-organise itself, to pay off large loans, and to build network infrastructure into rural areas. But that window of monopoly was a lost opportunity. None of the goals set for the monopoly - re-organisation, loan re-payment, or significant rural roll-out - were achieved. Services provided by the monopoly did not improve either in quantity or quality. There was no significant investment in fixed-line infrastructure, leading to deteriorating quality of service.

There was, however, significant investment in service areas where competition was allowed – such as cellular telephony and Internet. In the case of Internet, there has been improvement in quality, reduction in cost, and an expansion of services through increased Points-of-Presence (POPs). There has also been expanded coverage of cellular telephony. It is clear that competition was the best tool to serve the consumer in these sectors. Competition helped to address changing consumer tastes – something not addressed by the monopoly operator.



Source: Economic Survey 2003, Operators, Summit Strategies Ltd. estimates

The success of market segments featuring heavy private sector investment might suggest that the government should focus its resources on other socially-beneficial areas, and leave telecommunications to private-sector forces – the classic case made by advocates of liberalisation. For those consumers who can afford the services, this would be good. But for those who can't afford, complete control by market forces could cut them off from information for development.

Revenue generation in the sector increased in overall volume in the 1999-2003 period, but not in terms of average revenue per user. Indeed, the increased customer base resulted in reduced average revenues per user. Increased roll-out has connected less-affluent consumers. This has dissuaded operators from going into the deep rural areas, due to the reduced incomes realised from customers who are more expensive to connect. The cellular operators' overall profitability has been particularly high, resulting in increased incomes for rapid expansion in coverage, but the expansion has focussed on main cities and towns and along main transportation routes.

The monopoly fixed-line operator, Telkom Kenya, is in a sorry state, saddled with dwindling revenues and increased costs due to technological, managerial and market challenges. It faces the real risk of financial collapse. An issue that needs to be urgently addressed is the continuing decay of the national investment in this fixed-line operator – an investment that is not likely to be recovered.

Summary

The impact of the telecommunications reforms in Kenya can most easily be assessed and summarised in terms of three of the objectives that formed the cornerstones of the policy reform:

- Cost of services
- Infrastructure roll-out
- Quality-of-service

Cost of services: During the five years (1999-2003) of Telkom Kenya's mandated exclusivity in fixed-line voice services, the continuing high cost of local fixed-line voice calls has been a major spur for

liberalisation demands. Five years of liberalisation in other service areas, such as Internet and cellular, has resulted in reduced tariffs. But in the monopoly fixed-line services, Telkom Kenya's tariffs only came down for international and national long-distance traffic, as part of a rate re-balancing programme. At the same time, Telkom Kenya raised its tariffs for local calls, under the same re-balancing programme.

Infrastructure roll-out: In the pre-reform era, fixed lines were in short supply, with a long waiting list for connection. A key objective of the policy reform was to create an enabling environment for the private sector to invest in, and expand, the country's telecommunications infrastructure. But failure to find a private-sector strategic equity partner (SEP) to take a stake in state-owned Telkom Kenya has meant that the fruits of private-sector involvement have only been felt in the liberalised segments of the sector. In both the Internet Service Provider (ISP) and cellular telephony markets – where the policy allowed for a multi-operator environment — the resulting private-sector involvement and competition have vastly expanded some aspects of network capacity and coverage. By end of 2003, close to 60 percent of the population had cellular signal coverage and all major towns had Internet Points of Presence (POPs). Meanwhile, the fixed-line infrastructure run by Telkom Kenya stagnated, in spite of the firm's monopoly protection.

Increasingly, the future challenges for infrastructure growth will fall outside the formal telecom sector. The key obstacles are a lack of electricity to charge cellular terminals or to power cellular base stations and, most importantly, the lack of household income among consumers to pay for services.

Quality-of-service (QoS): A further area of concern is quality-of-service (QoS). For Telkom Kenya's fixed-line service, service quality did not improve during the 1999-2003 period of reform. The faults incidence did not change, and neither did the rate of fault clearance. The call completion rate is just as bad as it was five years ago, at the time of the launch of reform. In the market segments with competition, the level of choice has reduced the impact of service quality problems. The service disruptions encountered by one of the cellular providers have been blamed on rapid growth.

Conclusion

Overall, the government faithfully implemented the 1999-2003 policy framework, and in particular the monopoly provisions for Telkom Kenya. While government's adherence to the policy gave investors confidence in the government's intentions, it did not take into account the fast-changing telecommunications scenario. Evident policy failure in certain areas was not corrected in time. A case in point is the fast growth in cellular. Cellular users overtook fixed-line in less than a year of the competitive environment, but policy did not change fast enough to include cellular in universal service obligations. Other areas that needed policy review were the increasing convergence of services, the growing importance of Internet, and the inability of the monopoly operator to deliver on roll-out commitments.

Secondly, the profit motive increased interest in the profitable areas, at expense of poorer areas. Most of the emphasis for cellular is therefore in the urban areas, and along the main road network. The rural poor have not been addressed.

Finally, the intention of the policy was to position telecommunications as a service to the economy. Despite attempts by the government to review the sector policy to widen its scope and integrate it with other socio-economic endeavours, this has not been achieved. An effort to draft a national ICT policy has not been realised and therefore no national framework to exploit telecommunications for socio-economic development is in place. This impasse has encouraged other sectors to produce sectoral ICT strategies, with a consequential loss of synergy. (Incidentally, the first such sectoral strategy came from government itself: an e-government strategy.)

It is time to move fast and review the existing telecommunications policy, learn from its failures, and widen the mandate to position telecommunications and indeed ICTs as a service to socio-economic development for all citizens.

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Rwanda

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The telecommunications sector is very young in most African countries and as in many cases in Africa, the industry was introduced to serve mainly the government machinery, without any vision of expansion of access to the citizenry.

To evaluate the development of the telecommunications sector in Rwanda, it is necessary to look at both infrastructure and services. Attention must also be paid to issues of policy and regulation, competition, and, more importantly, the policy and practices for universal access, as many Rwandans living in remote areas can neither access nor afford to pay for telecommunications services at the high costs that prevail today. However, baseline studies of this kind are severely limited by the lack of data and the information vacuum that exists in the country, and the historical absence of reporting or transparency of government-run operations.

Rwanda is the most densely populated country in Africa, with over 390 habitants per square kilometre, with the population increasing at a rate of 3.6 percent per annum. Being mostly a subsistence

| Rwanda | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | no data | no data | no data |
| Total telecom revenue per capita (US\$) | 2.28 | 2.53 | no data |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 57.19% | 54.80% | 51.22% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.5043 | 0.8177 | 1.3556 |
| Cellular subscribers per capita | 0.0050 | 0.0082 | 0.0136 |
| Internet users per capita | 0.0006 | 0.0025 | 0.0031 |
| Main lines per capita | 0.0023 | 0.0027 | 0.0028 |
| %age cellular revenue to total telecoms revenue | no data | no data | no data |
| Total telephone subscribers per 100 inhabitants | 0.73 | 1.09 | 1.64 |
| Total telecom revenue as % of GDP | 1.0% | 1.2% | no data |
| Waiting list for main lines | no data | no data | no data |
| Total telecom revenues per subscriber (US\$) | 311 | 232 | no data |
| Main line telecom revenues per subscriber (US\$) | no data | no data | no data |
| Cellular revenues per subscriber (US\$) | no data | no data | no data |

Source: ITU World Telecommunications Indicators 2003

agricultural country with over 90 percent of the population in rural areas, almost all arable land is under cultivation. Rwanda is classified among the world's poorest countries, with an estimated 60 percent of Rwandans living below the poverty line. The 1994 war and genocide not only brought down the entire economic sector but also worsened and

destroyed the social fabric, thus exacerbating the pre-war socio-economic crisis. While the war and genocide aggravated poverty, poverty in Rwanda has been long-standing. The poverty is interconnected with many factors, including environmental degradation and the decreasing availability of arable land, a low level of human resource development, and poor governance characterised by heavy centralisation and a culture of impunity.

The two major obstacles that Rwanda is facing for ICT to take off are the lack of human resources – both in technical matters and policy/regulation - and the general context of poverty, whereby the basic infrastructure, such as electricity and telecommunications facilities, is very limited.

Policy Reform & Institutional Capacity

Since 1998, the Rwandan government has worked on a national framework for the development of an ICT sector, resulting in the ICT Policy for Rwanda, adopted by the Cabinet at the beginning of 2000. The policy states the vision and strategies for transforming Rwanda's predominantly agricultural economy into a knowledge-based economy, through the adoption and development of ICTs and their applications.

The principal policy instrument for this transformation is Rwanda's National Information and Communications Infrastructure (NICI) plan, which is supplemented by a blueprint of specific initiatives

for achieving the policy objectives, in line with Rwanda's Vision 2020. The first quarter of the blueprint covers the period 2001-2005, and revolves around eight pillars - human resources, ICT infrastructure, e-government, community access, ICT in education, legal/regulatory provisions, private-sector facilitation, foreign direct investment (FDI) - all of which aim at promoting ICT.

For ICT to be an enabler, a basic level of institutional capacity is required, and ICT cuts across all sectors, requiring a comprehensive and holistic approach. Rwanda has established the Rwanda Information Technology Authority (RITA), responsible for catalysing and facilitating national and sectoral ICT strategies.

A New Regulator

In addition, reform has resulted in the establishment of a multi-sector regulatory body, the Rwanda Utilities Regulatory Agency (RURA), in January 2003, with jurisdiction over several market sectors including energy, transport, communications and waste management. This new agency does not yet have the human capacity needed to serve all the sectors it oversees, including the growing ICT market. A key task for the agency will be to address the issue of universal access to all essential services, given that much of the population lives in rural areas where basic infrastructure such as water, electricity, telecommunication facilities and roads are still lacking.

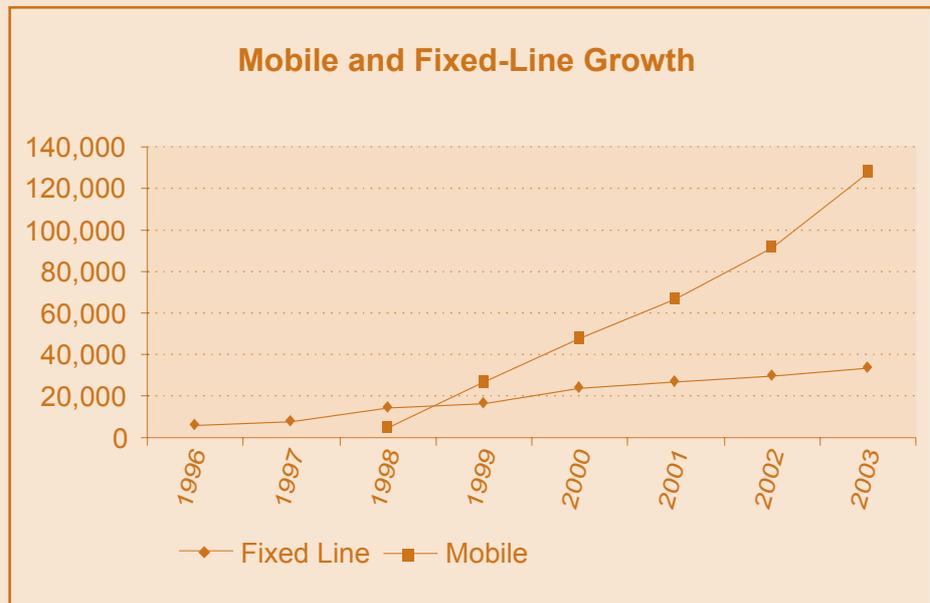
The Market

The Rwandan government owns the major telecommunications company, Rwandatel, which provides fixed-line telephone services and Internet. The Ministry of Infrastructure oversees the company and, until January 2003, was responsible for issuing new licenses for all telecommunications services.

A new private-sector player, Artel, is providing fixed telephony over VSAT satellite, mainly in remote areas. Artel is not seen as a competitor to Rwandatel but rather as a complement to the incumbent, by providing access to remote areas where lack of infrastructure has been a big handicap for telecommunications facilities roll-out.

MTN-Rwandacell is the only mobile cellular firm, established in 1998. A second mobile license is due to be awarded, to Rwandatel, once Rwandatel is privatised — a task being undertaken by the Rwandan Privatisation Agency. Mobile has shown great success over the past four years, and MTN-Rwandacell now covers 67 percent of the country.

State-owned Rwandatel is the major Internet provider, but there are four other players: Mediapost, Artel, Terracom and KIST (a higher educational institution). There are an estimated 100 cyber cafes in the country, about 75 percent of them in the capital Kigali.



Source: MTN Rwandacell / Department of Accounting

Universal Access

A number of policies have been adopted by the government of Rwanda to ensure access to telecommunications facilities especially to underprivileged areas. The universal access Fund will be supported from:

- 2.5percent of the telecom companies annual revenue
- a certain percentage to be allocated from the government annual budget

The target that the government is working on is that within the five coming years the average distance to access a public phone will decrease from 15 to 3 kms.

In addition, the government has decided that all ICT equipment (including electrical equipment,

generators, solar panels) is now exempted from import taxes.

Education Sector

The education sector is the major beneficiary of ICT access. Each primary school will get at least one computer connected to the Internet, 300 secondary schools have been selected and will get 10 computers connected to the Internet, and tertiary education will share the Internet connectivity through the Rwanda Education Network (Rwednet). The remote schools where electricity is lacking will be supported through solar panels.

Conclusion

Rwanda has been wracked by under development and ultimately genocide. It is invariably ranked amongst those at the bottom of all development indices, including its ICT indicators. The government, however, has committed itself to ICT development as a catalyst to contribute to the social and economic recovery of the country. This, however, requires an integrated ICT policy and one that will be realised in practice through the building of the capacity of the regulator, the leveraging of private resources and the inducing of infrastructural investment and development.

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South Africa

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The last decade has seen dramatic shifts in the telecommunications sector, with the rise of the Internet fundamentally changing the way business and individuals communicate and wireless mobile services providing connectivity to millions of people previously excluded from having a phone. In South Africa the sector has grown dramatically from contributing less than 2percent to the Gross Domestic Product in the early 1990s to just less than 6percent by 2003.

The 'managed liberalisation' policy for the sector saw the partial privatisation in 1996 of 30percent of the fixed line operator, Telkom, to a strategic equity partner, with the subsequent floating of another 28percent of the company on the stock exchange in 2003. The granting of a third mobile licence in 2001 brought further competition to the duopoly mobile market and this could be extended with a fourth entrant. There will be a competitor to the fixed-line incumbent, Telkom, following the delayed licensing process to find the remaining 51percent share of the Second Network Operator, currently owned 30percent by Transtel and Eskom and 19percent by empowerment group Nexus. The two aspirant bidders for the remaining 51percent of the licence, Communitel and Two Consortium were awarded 13percent each of the SNO, with 25percent being warehoused. A third international gateway is also available with the granting in 2002 of the international 'carrier of carriers' and multimedia licences to Sentech. Also severely delayed has been the licensing of under-serviced area operators. It is hoped that by the fourth quarter of the year the initial 10 of the nearly 30 districts identified as having tele-densities of less than 5percent,

| South Africa | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | 1.4% | 1.2% | 0.7% |
| Total telecom revenue per capita (US\$) | 156.35 | 139.07 | 117.46 |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 3.72% | 3.43% | 4.91% |
| Cellular mobile telephone subscribers per 100 inhabitants | 19.0886 | 24.2118 | 30.3912 |
| Cellular subscribers per capita | 0.1909 | 0.2421 | 0.3039 |
| Internet users per capita | 0.0549 | 0.0649 | 0.0682 |
| Main lines per capita | 0.1136 | 0.1105 | 0.1066 |
| %age cellular revenue to total telecoms revenue | 44.3% | 47.6% | 57.0% |
| Total telephone subscribers per 100 inhabitants | 30.45 | 35.26 | 41.05 |
| Total telecom revenue as % of GDP | 5.3% | 5.4% | 5.1% |
| Waiting list for main lines | 50,000 | no data | no data |
| Total telecom revenues per subscriber (US\$) | 514 | 394 | 286 |
| Main line telecom revenues per subscriber (US\$) | 652 | 551 | 474 |
| Cellular revenues per subscriber (US\$) | 363 | 273 | 220 |

Source: ITU World Telecommunications Indicators 2003

will be licensed. This will give Small Medium and Micro Enterprises (SMMEs) and historically-disadvantaged communities an opportunity to enter the telecommunications market.

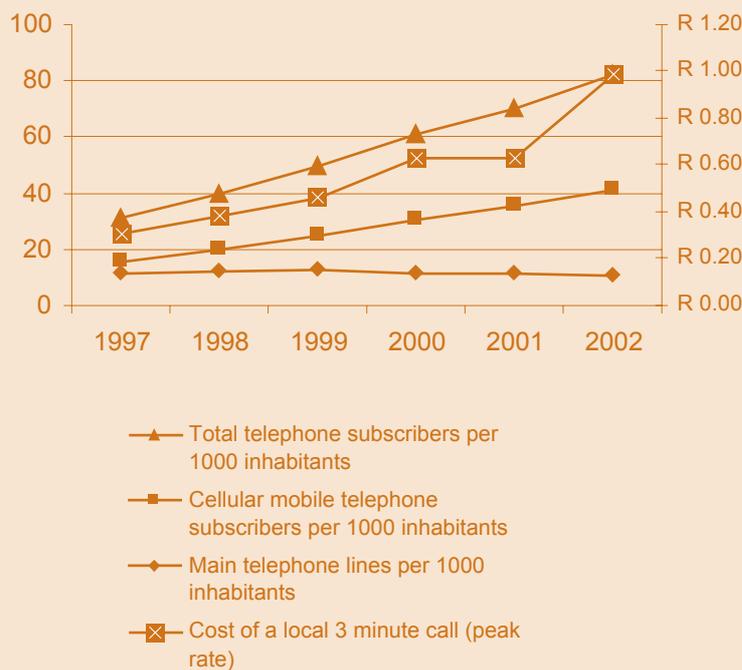
The value-added network services (VANS) market, which in South Africa includes Internet Service Providers, is liberalised, but its activities have been stunted by restrictions which require that VANS acquire facilities from Telkom. Following rulings by the regulator on several disputes lodged by the Internet Service Providers and South African VANS Association against Telkom being challenged by it in the courts, the Competition Commission recently recommended to the Competition Tribunal that Telkom pay a fine of 10percent of total turnover, over R3billion (US\$19.3million), for anti-competitive practices.

In line with global trends, and in compliance with World Trade Organisation commitments, the development of the telecommunications market has been overseen by a sector regulator - initially the South African Telecommunications Regulatory Authority (SATRA) and following its merger in 2000 with the Independent Broadcasting Authority (IBA), the Independent Communications Authority of South Africa (ICASA).

Gains have clearly been made. However, developments within the sector have been characterised by a range of unintended policy outcomes and a series of costly licensing and regulatory disputes. As telecommunications has led the way with regard to the liberalisation of infrastructures in South

Africa, it should not be surprising perhaps that the sector has been so wracked by controversy. While some of these disputes have been viewed as the inevitable birth pangs of institutional and market reform, the lack of capacity to implement policy effectively has often been identified as the root of the problem. This review seeks to assess the policy and regulatory framework in terms of the performance of the telecommunications sector and the degree to which policy outcomes have fulfilled national objectives. As the size of the South African economy and the relatively high per capita incomes in the country can outweigh other determinants of sector performance, and because South Africa's ICT indicators are generally much higher than in most other countries on the continent, the study also includes some comparisons with other lower middle-income countries with comparable economies, such as Poland, Mexico and Turkey.

Total telephone density in South Africa + cost of a local 3 minute call (Rands - peak rate): 1997 - 2002



Source: ITU World Telecommunications Indicators 2003

individuals; developing a strong consumer focus that takes into account the needs of local communities and disabled users; ensuring technical compliance and efficiency; and facilitating the development of human resources within the sector.

Fixed Network

From the perspective of promoting universality, the strategy to boost telephone penetration through the granting of a five-year exclusive licence on PSTN services to Telkom in exchange for the doubling of the network has not produced the desired outcome. In South Africa, fixed-line teledensity currently stands at 11percent and fixed-line household penetration at an estimated 31percent. At the time of its privatisation and granting of exclusivity in 1997, Telkom was given mandatory service obligations to install 2.69 million new lines. During the next five years Telkom installed 2.8 million new lines but only 665,819 of these lines remain connected to end users, resulting in overall fixed-line network penetration falling in the last three years of the exclusivity period up to 2002. Price increases way beyond what was anticipated by rate rebalancing, have contributed to this dire situation. Charges have increased by more than 27percent on average a year, and the cost of a local call is now almost five times what it was in 1996 (Telkom, 2002). The net effect of this is that more than 2 million lines — more than 75percent of the licence obligation for network expansion — are not connected to subscribers. Moreover, even these figures mask the actual penetration rate for residential subscriber service. Of the 4.9 million fixed lines in operation in South Africa in 2002, 467,518 were ISDN lines, 195,399 were pay-phones, and 707,881 were pre-paid fixed lines. ISDN lines are really substitute lines to provide additional capacity for advanced services for existing subscribers, and while recent

Policy & Regulation

While criticisms abound over the lack of certainty and stability in the sector created by a constantly shifting policy framework, these changes reflect the anxiety of government to respond to the fundamental technological and economic shifts that underpin the burgeoning global network economy. The recently proposed convergence legislation represents the third major overhaul of telecommunications policy since the first participatory and consultative policy process was initiated in the mid-nineties. Throughout these changes, however, the core policy objectives have to some degree remained unfulfilled. The changes to legislation have largely been geared at devising methods to achieve these objectives. The policy continues to seek a balance between the provision of basic universal service to disadvantaged rural and urban communities with the delivery of high-level services capable of meeting the needs of a modern economy. Other policy goals include the promotion of an innovative and responsive sector through the development of broad and diverse service offerings; a competitive manufacturing and supply sector; the promotion of competition; investment and stability in the sector, as well as encouraging a diverse shareholder base through the promotion of SMME's and historically disadvantaged groups and

increases in pay-phones and pre-paid fixed lines are commendable, they help disguise the fact that subscriber fixed lines declined by 10percent to 3.6 million in 2002. It is possible that there are now fewer residential subscriber fixed-line customers than there were in 1997. (Melody, 2002).

As a result, while fixed-line growth is slowing internationally, South Africa is now one of a handful of countries worldwide with a declining fixed-line teledensity. The complementary strategy of securing affordable access through the establishment of a Universal Service Fund, to subsidise network roll-out to under-served areas and access for needy people, has not relieved this dire situation. Shortly after the universal service Agency was established in 1997, it was decided that the fund would be used to roll-out telecentres in line with international trends towards the aggregation of needs and provisioning of services at collective access points. However, rather than overseeing this process, the agency took responsibility for implementing this highly-contested decision. Wracked by political and leadership crises and without the skills and experience to devise or implement such an ambitious programme, the model and implementation were severely flawed. By 2000, despite the high costs associated with the establishment of USA telecentres, less than half of the 65 telecentres established by the agency had working telephones and less than a quarter were regarded as sustainable by their managers (Benjamin 2001).

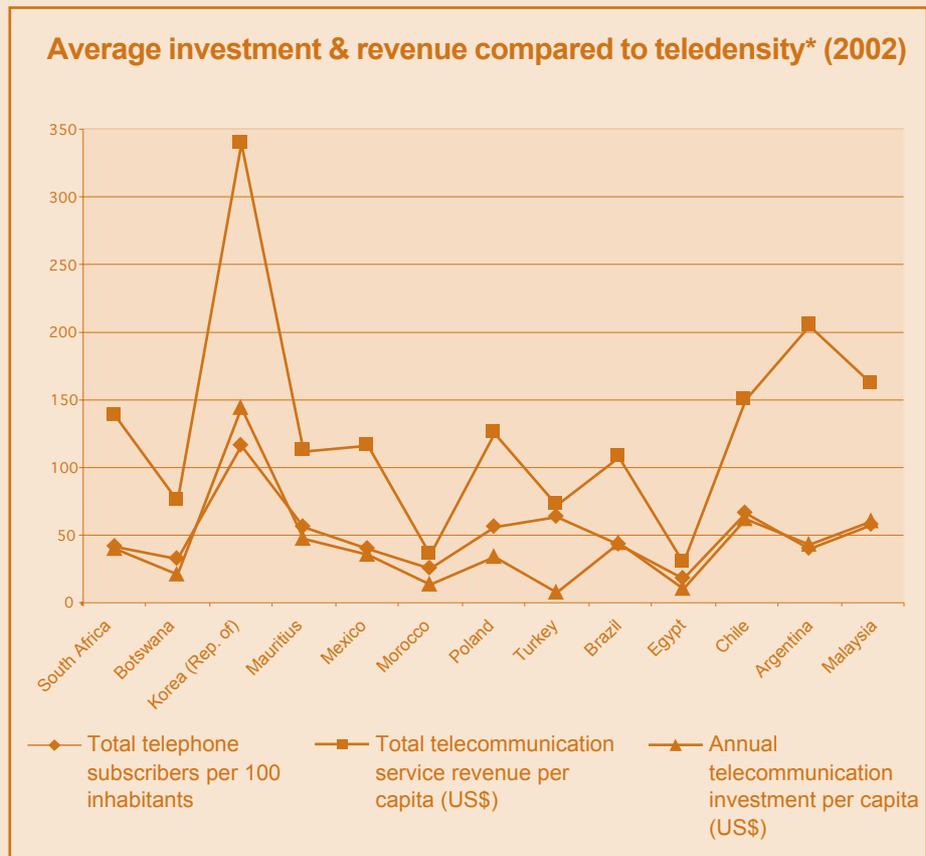
Mobile

However, the disappointing performance generally in the fixed-line sector has been compensated for by the unanticipated exponential growth in the mobile sector. According to the International Telecommunication Union (ITU), from a base of just under one million subscribers in 1996, the number of mobile subscribers in South Africa overtook fixed line subscribers in 1999 and, according to the most recent figures from Cellular.co.za, currently stands at 14.4 million users, of which 80percent are estimated to be active.

Mobile has proved to be a much more efficient technology for providing access to telecommunications services than have fixed lines. As an indicator of this, Telkom's lines per employee figure currently stands at 130 while Vodacom and MTN have similar productivity figures in South Africa at approximately 1600 connections per employee, in line with international mobile indicators.

Somewhat serendipitously, mobile services have gone a lot further in expanding universal service in South Africa, thereby fulfilling an objective that was originally intended to be accomplished through Telkom's exclusivity period. The number of mobile subscribers stands at almost triple that of the fixed network (14.5 million versus 4.9 million), with Vodacom's 7.5 million subscribers representing 60percent of the mobile market, MTN second at 5.22 million and the new entrant Cell C with 1 million subscribers as of February 2003.

Most commentators now agree that the means by which voice telephony universality will be achieved in South Africa and throughout the rest of Africa is through mobile services. However, the potential of mobile to close the gap on basic voice communications should not happen at the expense of the continued expansion of a more affordable public switched network, without which the digital divide will increase between those with access to voice communications only and those who are able to participate in the economy and society due to their access to enhanced services.



ITU World Telecommunications Indicators 2003

* Note: revenue is averaged up until 2001 for Botswana; Poland; Turkey; Brazil; Argentina & Malaysia

Investment is averaged up until 2001 for Botswana; Poland, Egypt; Argentina; Malaysia

Value-Added Network Services (VANS)

VANS may be the most important sector of the future economy. This segment of the market reflects the application of continuously improving technologies emanating from the telecommunication equipment, computing hardware and software, and consumer electronics industries. Integration of these technologies into the telecommunication network, and in terminal devices connected to the network such as personal computers and mobile phones, has provided the foundation for the continuous development of new electronic information/communication services, which are being applied throughout the entire economy (Melody, Currie and Kane 2003).

While the VANS market in South Africa is large by continental standards, this segment of the market has not flourished as well as was anticipated under a partially liberalised regime. The effect of Telkom's unchecked dominance of the market has had a chilling effect on the liberalised market segment, due to its unconstrained control of bandwidth and pricing, despite the intention of the policy and law to include price regulation. The negative impact of this has not only been on users and consumers. High communications costs impact on the economy more generally and are a major consideration in the determination of investment destinations even for non-telecommunications activities.

Telkom's market dominance has also been the source of the majority of complaints that have tied up the newly-established sector regulator ICASA, and the Competition Commission and the courts. Most of the complaints have related to boundary issues between what constitute VANS and what is in the exclusive PSTN domain, and around the provision of facilities by Telkom to VANS. While the total value of the data services market, excluding Telkom, was worth R2.88 billion in 2002, Telkom's 2002 Annual Report states that its data business revenues alone were R3.9 billion. While all these revenues would not equate with VANS services directly and although internally Telkom would classify many of these services as PSDN services, one can deduce that a significant amount of these revenues derive from data services which may be classified as VANS when offered by other players. This would make Telkom a major, if not *the* major, player in the VANS market.

Internet

With ISPs classified as VANS providers in South Africa, they have been at the forefront of complaints. Nevertheless, Internet in South Africa has continued to grow over the past six years, but recently at much slower rates. According to World Wide Worx, 2.89 million South Africans had access to the Internet at the end of 2001, and this figure was expected to grow to about 3.1 million by the end of 2002. This growth rate of less than 10percent would mark the lowest growth rate achieved since the public was first given access to the Internet in South Africa in 1994. World Wide Worx estimates that 1 out of every 15 South Africans had access to the Internet as of the end of 2001, and that it will take until 2006 before this figure reaches 1 in 10. Like other value-added services, around 70percent of the ISP costs accrue directly to Telkom for facilities and usage, and likewise around 70percent of the usage costs for Internet services go towards line rental and call charges. The raising of the local call price by Telkom has impacted dramatically on the cost of Internet services and internationally, evidence, with few exceptions, suggests that as long as costs remain this high Internet penetration will be stunted. In the past five years of Telkom's monopoly there has been an international decrease of 65percent in Internet costs and a 45percent increase in Telkom costs.

Remedies

At the heart of the regulatory challenge facing South Africa is the market design arising from the reform process. The market is structured around a vertically integrated national company, from whom rival firms, (with whom the integrated company competes downstream), are required to acquire their non-competitive facilities in order to operate, or with whom other networks have to interconnect in order for their customers to access the historically larger number of subscribers on the incumbent's network. This structure creates anti-competitive incentives for the incumbent to deny access to its network to rival firms, whether through delays or pricing strategies. Access regulation has been adopted by regulators across the world facing this type of market structure. This regulatory approach depends on relatively complex costing models that are particularly onerous to enforce, especially when the former public utility's accounts are not clearly separated and there is not a sense of what constitutes real costs. Even once costs are realistically allocated there are inherent information asymmetries that disadvantage the regulator, as the incumbent operator will always have better knowledge of its own costs than does the regulator. This resource intensive regulatory approach arising from such market structures places an enormous regulatory burden on the country and requires expensive and skilled regulatory machinery to operate effectively.

Addressing this fundamental structural issue will require a major review of policy and, as in other markets, consideration of the structural separation of the different market segments to reduce anti-competitive incentives. However, the government has the powers within the existing legislation to

remove some of the inhibiting effects on the development of this critical sector of the national economy which have been the source of the industry complaints that have encumbered ICASA, the Competition Commission and the courts. These would include removing the artificial distinction between voice and data in a digital environment, specifically VoIP, and permitting the alternative provisioning of facilities, resale and direct connect by certain categories of network operators. To prepare for a converged policy environment the capacity of the various networks in the country should be optimised by the lifting of restrictions on all networks in order to create an integrated information infrastructure required for a networked economy.

Empowerment

Other than the shareholding in major licences such as the third cellular licence and SNO, there have not been many empowerment opportunities and where they have occurred they have seldom included women, who are specifically mentioned with regards to equity in the law. Although the major telecommunications companies do contribute to empowerment within the sector through procurement quotas or thresholds, these are difficult to quantify and do not impact on the ownership and control within the sector. The policy decision to grant licences to SMME's and communities in under-served areas (USALS) has considerable potential to contribute to the black empowerment objectives of sector and national policy, if an enabling regulatory and investment environment is created for them. With delays to the licensing of these small operators and the unsupportive regulatory and funding environment under which they will need to operate, the outcomes of this closing window of opportunity cannot yet be assessed.

Consumer protection

Likewise, although not quantified here, the lack of competition across the sector and the failure of the regulator to establish an effective consumer complaints regime have negatively impacted on consumers. While this should be alleviated with the second network operator on the PSTN side, its entry into the market should not be regarded as a substitute for an effective consumer complaints regime for the industry. Even within the mobile industry, where there are three competitors, subscribers are tied either into contracts which do not leave them with choices or they are effectively tied-in by the inconvenience and cost of changing numbers, stationary and the like. The intended introduction of number portability and carrier selection will go some way to ameliorating this problem and increasing the competitiveness of the sector. While it is true that considerable gains have been made in the customer service side of the industry in order to attract customers since the start of sector reform, dispute mechanisms are far from adequate and need to be addressed if the credibility of the sector is to be improved. These important issues will be the subject of future research.

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Uganda

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The reform of the telecommunications sector in Uganda started in the early 1990s, with a formal law being enacted in 1997 and the regulator put in place during mid-1998. Five years down the line since the enactment of the sector law, it is necessary to take stock of the achievements *vis-a-vis* the sector policy and the policy's objectives.

It is necessary to point out areas of weakness and under-performance that need to be addressed at policy or regulatory level, so that the sector can support the achievement of clear national development objectives.

The experience of Uganda and lessons learnt can also be beneficial to other African countries that are either at the same level, ahead, or behind Uganda in terms of telecommunications sector reform and development. By drawing upon experiences and lessons from a similar socio-economic environment, African countries will be increasingly able to formulate sector policy and laws that enable the use of telecommunications to support sustainable human development.

Uganda, with a population of 24.7 million, a real GDP per capita of US\$192 in 2002, and a human development index of 0.449 in 2001, is classified among the world's least developed countries. It has, however, gained international recognition because of its liberalised economic environment and other policies that have led to consistent growth over the

| Uganda | 2000 | 2001 | 2002 |
|--|---------|---------|---------|
| Annual telecommunication investment as % of GDP | no data | no data | no data |
| Total telecom revenue per capita (US\$) | no data | 8.72 | 11.13 |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 64.57% | 62.58% | 102.88% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.8200 | 1.1582 | 1.5923 |
| Cellular subscribers per capita | 0.0082 | 0.0116 | 0.0159 |
| Internet users per capita | 0.0017 | 0.0025 | 0.0040 |
| Main lines per capita | 0.0027 | 0.0024 | 0.0022 |
| %age cellular revenue to total telecoms revenue | no data | no data | no data |
| Total telephone subscribers per 100 inhabitants | 1.09 | 1.39 | 1.81 |
| Total telecom revenue as % of GDP | #VALUE! | 3.5% | 4.6% |
| Waiting list for main lines | no data | no data | no data |
| Total telecom revenues per subscriber (US\$) | no data | 626 | 613 |
| Main line telecom revenues per subscriber (US\$) | no data | no data | no data |
| Cellular revenues per subscriber (US\$) | 264 | no data | no data |

Source: ITU World Telecommunications Indicators 2003

last 15 years. It is against this background that the reform of the telecommunications sector started, and has been going on, since the early 1990s.

Motivation for Reform & Reform Objectives

The initial motivation for reform in Uganda was the fact that the then Uganda Posts and Telecommunications had established a record of consistently poor performance, characterised by failure to expand the network (which served less than 40,000 mostly urban customers) and a consistent need for subsidy to cover costs. Broader considerations, and other objectives for reform, only emerged during the reform process itself, and were captured in the drawing up of transaction documents and licenses, and in the drafting of the Uganda Communications Act of 1997 (the Act). Reform was therefore not approached in a holistic manner, and did not focus specifically on development, especially human development.

As a consequence, Uganda enacted an extremely liberal telecommunications act, creating an environment that has had significant success in delivering the benefits of reform. This has been partly helped by historical accident, such as the failure to privatise Uganda Telecom and to award the Second National Operator license.

The specific policy objectives, as paraphrased from the Act, are:

- Setting up an independent regulator;
- Reducing government's direct role as an operator in the sector;
- Encouraging private sector participation and investment;
- Minimising all direct and indirect government subsidies to the sector;
- Enhancing the coverage of communications services and products;
- Modernising and expanding postal and telecommunications services;
- Introducing, encouraging and enabling competition in the sector through regulation and licensing of competitive operators (to achieve rapid network expansion, standardisation, and competitively-priced, quality services);
- Establishing a fund (Rural Communications Development Fund - RCDF) for rural communications development.

The Market

Uganda's telecommunications market operates under a duopoly regime, with two national operators, MTN (Mobile Telephone Networks Uganda Ltd.) and UTL (Uganda Telecomm Ltd.), licensed to compete without geographical limitations in the provision of telecommunication services. Only these two national operators are licensed to have international gateways, to provide fixed-line local loop access, and to provide switched traffic between networks. Due to historical accident and delays in privatising the incumbent UTL, six other data gateways, and a third mobile cellular provider, have also entered the market.

The national operators are obliged to interconnect with the other operators, to give non-discriminatory services to value-added network service (VANS) providers, and to meet roll-out and quality-of-service (QoS) targets.

Regulation

The operators in the market are regulated by the Uganda Communications Commission (UCC). The Act grants a fairly high degree of independence for the UCC by requiring some civil society participation in identifying UCC commissioners; minimising legal channels for political interference; and setting out a funding model that does not require government support. The strong performance of the market, coupled with a culture of the regulator keeping a reasonable distance from the political arm, has also added to the climate of reasonably independent regulation. However, the Uganda Communications Tribunal, a specialised appeal mechanism that would provide faster response (compared to the courts) on issues where licensees are not satisfied with the regulator's decisions, has not yet been set up as required by law: Government wants to avoid the recurrent cost that they feel is not justified. They however should either comply or revise the provisions in the Act without compromising the need for fast redress in a dynamic sector.

Performance

Some key observations on the performance of the Ugandan telecommunications sector are:

- Cellular telephony, with most subscribers using the pre-paid model, has become the basic telephony platform. While the number of fixed lines (both wired and wireless) still remains below 65,000, the number of mobile subscribers has grown to over 711,000 (Uganda Communications Commission figures for 2003).
- Investment has been high in the sector, exceeding US \$270 million in 2002 (Ministry of Finance, Planning and Economic Development, 2003). Growth rates in the sector peaked at almost 40percent in 2000, before dropping to about 18percent in 2002, which is still well above the overall GDP growth that had a range of 5-6percent over the same years (the Ministry of Finance, Planning and Economic Development, 2003).
- National coverage has greatly improved, with all the country's districts except Pader now accessible by phone.
- The Rural Communications Development Fund is delivering support in ICT training, content creation, establishment of Internet Points-of-Presence (POPs), and fostering basic access.
- Tariffs have been driven down — through competitive pressure — by factors of as high as five, especially for international calls. Intra-network calling tariffs have also been dropping as the market matures and the mutual benefit of low tariffs is appreciated.
- But utilisation of the Internet — in spite of the liberal regulatory environment — is still very limited. By the end of 2003, the total incoming Internet bandwidth to Uganda was 25Mbps. In more mature economies, that amount of bandwidth would be considered insufficient for even a single institution.

Evaluation of Performance Against Policy Objectives, With Recommendations

The fact that there were generally no quantifiable targets set out in the policy objectives necessarily makes evaluation subjective. The numerical roll-out targets set out in the national operator licenses were generally so low that many of them were achieved within one month, instead of over an estimated timeline of five years (MTN Compliance Report, 2003). The roll-out targets also related to infrastructure rather than development impact — a result of the failure to apply a holistic approach to sector policy formulation. These two major policy short-comings — the smallness of the targets and the lack of developmental targets — need to be addressed as Uganda plans for the end of the national duopoly period.

Qualified success has been achieved in the specific policy objectives discussed below, with many challenges still remaining:

- **Setting up the independent regulator:** The UCC was very proactive initially, using all legally permissible means and loopholes to enable competition in the sector. Its decisions on licensing data gateways (when a loophole permitted it), the RCDF policy and strategy, the decision to shift to technology-neutral regulation, and the decision to award Celtel its own gateway are all good examples of the younger, bolder UCC.

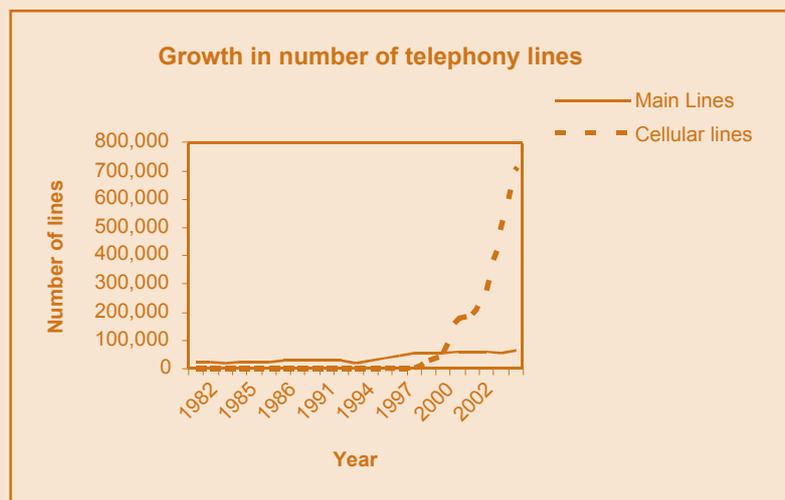
The more recent avoidance of the Internet telephony controversy, the indecision about the control of the .ug domain, the inaction about considering legal and regulatory arguments as to whether restriction of data gateways is really a duopoly provision, are all examples of the current, more cautious UCC.

It is widely accepted that the UCC is an independent regulator that has performed well. But such recognition can create the success syndrome: loss of the pioneering spirit, arrogance, complacency and rigidity, negating the very factors that fostered success. The UCC must consciously avoid falling into this trap.

One area of concern for the regulatory environment is the government's failure either to set up the Uganda Communications Tribunal or to modify the Act to make another provision.

- **Reducing government's role as operator and minimising state subsidies:** Government has completely pulled out of the regulatory sphere, and has to date established a consistent pattern of not interfering with the regulator. The state's majority shareholding in UTL was sold to a private investor, and management control was also fully surrendered. Government does, however, continue to have full ownership of postal services.

- **Encouraging private sector participation and investment:** A great deal of private sector participation has been achieved, but there are still regulatory and procedural barriers to market entry and exploitation. For instance, the duopoly provisions in the national operator licenses — rather than in the Act — have been used by the national operators to block, sometimes successfully, initiatives by other operators. And some provisions in the Act give the UCC the discretion to grant licenses (such as ISP licenses) that should really be automatic. (Note: the practice has been to make such licences automatic, but it is still legally possible for the regulator to use this provision to prevent entry.)



Source: Uganda Communications Commission

It is also clear that private-sector investment has expanded considerably. While the single biggest capital injection during the 1999-2002 period was the US\$20 million spent by government to upgrade

the telephone cable network, private-sector investors have, in the period 1999-2002, injected about US\$550 million into the sector. The Ugandan government would not have been able to mobilise that kind of single-sector investment without compromising other sectors.

But a policy challenge arises: Most of the more developed countries in the world liberalised and privatised their telecommunications sectors after achieving high levels of access (based on a universal service approach). Based on performance over the last five years, Uganda, and other countries in similar situations, need to re-think the policy of leaving major investment in sector development largely to the private sector. Uganda has a population of 24.7 million. Even if the target is to achieve only 5 million high-grade (in quality and bandwidth) connections, how long will this take, considering that we have achieved barely 400,000 effective subscriber lines (with very limited bandwidth) in seven years?

- **Enhancing the coverage of communications services and products:** Significant success has been achieved in addressing coverage. Utility, in terms of affordability, and in terms of individual telecommunication expenditure being an investment rather than a cost (i.e., shifting from the predominant usage of phones for social transactions to usage for transactions that have economic value) need to be addressed. Affordability should be addressed based on the basic access platform. This should be done through sophisticated regulation and promotion of competition rather than traditional brute force methods. The economic benefit of the widespread use of telephones is a social message that must be communicated more broadly.
- **Modernising and expanding postal and telecommunications services:** Telecommunications services have certainly been expanded and modernised. But a major challenge, especially if cellular remains a key platform for basic access, is to implement regulatory requirements or obligations for the roll-out of high-bandwidth technology as quickly as possible.

The inclusion of voice telephony in the duopoly provisions has unfortunately permitted the national operators to block the legal and widespread use of Internet telephony in the country. This has prevented the operators of data gateways from using this technology to deliver telephony, and has denied Ugandans this cheap means of communication. This has also been a *de facto* block on the implementation of call centres in Uganda: potential investors argue that the voice telephony costs via the national providers' gateways are prohibitively high. Unfortunately, the UCC has to date failed to address this issue seriously, despite the fact that the regulator has the legal means to do so.

- **Introducing, encouraging and enabling competition in the sector** through regulation and licensing of competitive operators (to achieve rapid network expansion, standardisation, and competitively-priced, quality services): Within the duopoly provisions, and as a result of the delay of the start of the duopoly period, a fair amount of competition exists in Uganda, but this is limited mainly to the major urban centres. And the issues of standardisation, competitive pricing and service quality have not been addressed by the regulator: these factors have been guided by market forces that have not necessarily achieved desirable outcomes. A continuing policy and regulatory challenge will be to control the cost of basic telephony, within the context of human development, for marginalised sections of Ugandan society.
- **Internet Access:** While this was not addressed directly in any way in the telecommunications policy and objectives, it is a critical sphere where action is required by the government and the regulator. The following issues need to be addressed:
 - Uganda is "e-landlocked," without direct access to the international fibre backbone. Until this is addressed, Ugandans will generally be locked out of the international knowledge society. Access to the international fibre backbone is a national strategic priority that cannot be left solely to private sector investment.
 - Creation of relevant and accessible content.
 - Achieving maximum national benefit in the interpretation of duopoly provisions (e.g., ending the moratorium on the provision of internet telephony by ISPs on the basis that voice telephony is restricted by duopoly provisions)
 - Addressing the cost of local access.
 - Implementing a national data backbone as an integral component of road construction and maintenance.
 - Promoting regional peering.
 - Addressing control of the .ug domain

Setting the Stage For the Post-Duopoly Period

The duopoly period ends on July 25, 2005. Uganda therefore faces the current challenge of re-assessing its telecommunications policy to not only prepare for full liberalisation, but also to address ICT policy and regulation in a manner that focuses more holistically on creating an enabling environment for private-sector-led human development (without interpreting this as an escape clause for government from the obligation of ensuring equitable access to relevant information resources for all the citizens). A national ICT policy should define the broad policy from which a new telecommunications sector policy emerges. The Uganda Communications Commission, on the presumption that government will liberalise fully, is putting the necessary instruments in place for the expected environment.

The process is unfortunately late: it is no longer possible to have the necessary instruments that will permit new operators to enter the market at the immediate end of the duopoly period, as would have been desirable. There will be *de facto* extension of the duopoly period, denying Uganda the immediate benefits expected from full liberalisation.

The new policies and regulations are also due to be brought on board at a time of major political change. The current trend points to a full opening-up of the political environment to multi-party democracy. This kind of environment increases the risk of major policy decisions being driven by short-term political agendas rather than by long-term development vision. Another risk of an uncertain political environment is a stagnation or drop in investment, compounded by the fact that Uganda has never had any peaceful presidential change. A wait-and-see attitude is likely to prevail at the time of full liberalisation if and when it happens (still with an "if" because government has to approve the policy first).

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Zambia

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The Communications Authority of Zambia (CAZ) was established by the 1994 Telecommunications Act, the same Act that divided the then-Posts and Telecommunications Corporation (PTC) into the Zambia Telecommunications Company (ZAMTEL) and the Zambia Postal Services Corporation (ZAMPOST).

The creation of policy is the responsibility of the Ministry of Communications and Transport, but to date there has been no official, approved ICT sector policy.

The objectives of the Act at the time of inception were to create a fair, transparent and predictable environment for all operators in the country. These objectives still hold today, but not all operators will agree that the objectives are being upheld.

The regulator has encouraged local ownership of market players, in that there must be at least a 30 percent shareholding by Zambians in any of the operators. This has been rigorously followed by the regulator.

All operators in Zambia are expected to pay 5 percent of their annual revenues before tax to the regulator. This, however, does not apply to ZAMTEL.

| Zambia | 2000 | 2001 | 2002 |
|--|--------|---------|---------|
| Annual telecommunication investment as % of GDP | 0.2% | no data | no data |
| Total telecom revenue per capita (US\$) | 6.25 | 6.54 | no data |
| Cost of a local call for 5 hrs (US\$) as % of monthly GDP per capita | 23.52% | 19.43% | 31.00% |
| Cellular mobile telephone subscribers per 100 inhabitants | 0.9611 | 1.1456 | 1.3004 |
| Cellular subscribers per capita | 0.0096 | 0.0115 | 0.0130 |
| Internet users per capita | 0.0019 | 0.0024 | 0.0049 |
| Main lines per capita | 0.0081 | 0.0081 | 0.0082 |
| Percentage cellular revenue to total telecoms revenue | 2.4% | 2.0% | no data |
| Total telephone subscribers per 100 inhabitants | 1.77 | 1.96 | 2.12 |
| Total telecom revenue as % of GDP | 2.0% | no data | no data |
| Waiting list for main lines | 13,347 | 12,826 | 11,631 |
| Total telecom revenues per subscriber (US\$) | 353 | 335 | no data |
| Main line telecom revenues per subscriber (US\$) | 752 | 781 | no data |
| Cellular revenues per subscriber (US\$) | 16 | 11 | no data |

Source: ITU World Telecommunications Indicators 2003

Policy Void Creates Problems

The lack of a telecommunications policy in the country has led to problems. The policy void has allowed the national government-owned incumbent operator, ZAMTEL, to sometimes oversee the implementation of national strategies to its advantage.

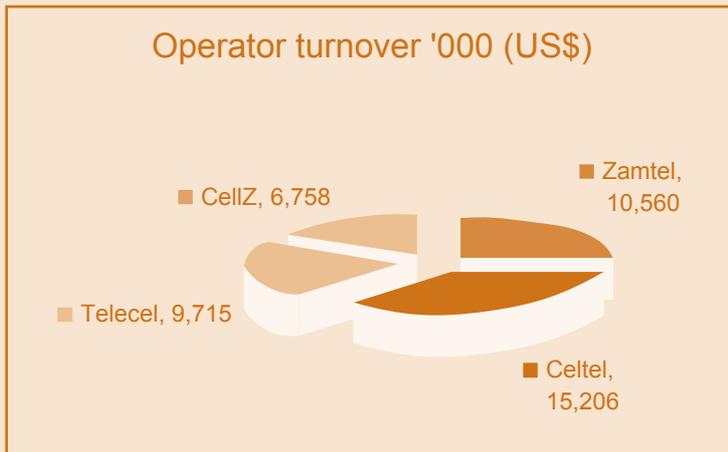
ZAMTEL remains the sole provider of fixed-line services in the country. There has been talk of a second or third operator coming into the market, but it is generally believed that the anticipated market entry costs are too colossal to attract players in this field. Efforts to get private investors to go into joint ventures with the incumbent have also not been successful.

The beginnings of liberalisation of the sector in the early 1990s saw the entry of competition into the mobile sector. Telecel entered the market, quickly followed by Zamcell, which subsequently changed its name to Celtel. The incumbent ZAMTEL's Cell Z service then became the third operator in the mobile sector. A fourth player, Vodacom of South Africa, was due to join the market in 2003, but the plans failed for several reasons, including spectrum capacity.

The Internet Service Provider (ISP) sector is liberalised, to the extent that one can set up an ISP as long as one pays the license fee to operate such a service. The operators all piggy-back on the national carrier, ZAMTEL.

The national regulator, the Communications Authority of Zambia (CAZ), regulates the provision of all telecommunication services, including products, and supervises spectrum management. Mobile has proved to be a more reliable service than fixed-line, though expensive in relation to the economic means of most Zambians. The expansion of mobile service by the three operators has allowed coverage to reach areas where the fixed-line provider has failed to offer service. The failure of the incumbent, ZAMTEL, to provide fixed-line services has contributed towards the high growth of mobile.

The number of mobile subscribers currently stands at 262,000, while the fixed-line total is 86,000. The market share for the mobile players breaks down as follows: Celtel 48 percent, Telecel 31 percent, and Cell Z 21 percent.



Stagnation of the Fixed-Line Sector

The strategic plan for ZAMTEL predicted a growth to 150,000 subscribers by the Year 2000, and while the current fixed-line capacity is estimated at 140,000 lines, the actual number of users is below 90,000. This fixed-line subscriber base is made up of 43,365 residential and 42,593 business lines. Tariffs have continued to rise, even as service levels have deteriorated. There is excess capacity with low market demand in urban areas and high demand but no capacity in rural areas. The roll-out of the fixed-line network largely follows the existing railway grid.

Internet Access

The Internet in Zambia has grown since its inception in 1994 by ZAMNET, and there are now six active

players in the market, out of the nine that are registered. However, the growth has been limited to the corridor along the rail line – where the fixed-line infrastructure is -- with little or no penetration into the rural markets and under-served urban markets. ZAMNET is the pioneer of the Internet services, established by the University of Zambia. Currently, ZAMNET has about 38 percent of the market share, followed by the incumbent fixed-line operator ZAMTEL's service at 34 percent and CopperNET with 19 percent. Three of the six main ISPs have foreign shareholding. Voice over IP (VoIP) is not allowed by the regulator.

According to available reports (ITU, COMESA) there are nearly 12,000 Internet subscriptions in Zambia, with the number of Internet users at between 40,000 and 50,000. A number of the subscriptions are corporate, or are used by collective access points like cyber cafes or Internet cafes.

Penetration of the Internet into the hinterlands of the country will require appropriate technologies for infrastructure roll-out.

Entrance of Cell Z

The recent entry of Cell Z has opened up the mobile sector, with Cell Z dramatically undercutting the prices of the two other existing mobile operators, Telecel and Celtel.

With its links to the incumbent, Cell Z has also had the means to target the under-served rural areas. The result has been a dramatic growth in subscribers, even in the short time that Cell Z has been operational. The impacts of the Cell Z pricing strategy still need to be assessed (Cell Z has been in the market for a very short time), but it is expected to have the following consequences:

- rapid increase in subscribers, leading to network congestion
- allegations of unfair competition from competitors

The reaction of competitors to the pricing strategy is still to be assessed.

Conclusion

The introduction of the regulator, CAZ, in 1994 was supposed to create a fair and competitive market. The question, however, is whether the regulator has delivered on its mandate. In the government's eyes, CAZ has delivered. In the opinion of the private sector, the regulator is only responding to its master's voice. Being part and parcel of the Communications Ministry, CAZ is seen to be carrying out

government orders. One of the obvious concerns is that the regulator sits on the board of the incumbent ZAMTEL, creating an apparent conflict of interest, with the regulator being both a player and the referee in the telecommunications sector.

In terms of mobile and Internet services, gains have certainly been made. However, they have not been made without problems being encountered, including court cases between the regulator and the mobile operators. The entrance of the incumbent's Cell Z service into the mobile market – and its extremely aggressive pricing strategy — could have dramatic consequences for the mobile sector, and will greatly test the ability of the regulator to act in an independent manner.

Finally, the development of the Internet sector is partially dependent upon the provision of low-cost bandwidth. Initiatives such as connecting to the SAT-3 cable, a national fibre-optic cable, and the upgrading of satellite bandwidth, may have the potential to provide this opportunity.

There are a number of issues the country has to address for the growth of the telecommunications sector to materialise in the country. The independence of the regulator is one issue. The regulator has to be moved away from the interference of the line ministry, so that decisions can be made which are binding on all operators and not just the private operators.

The national ICT policy has to be finalised, as most of the issues and bottlenecks that seem to impede growth have been addressed in the policy. The unbundling of ZAMTEL should also be considered, as this will lead to a level playing field for the mobile and ISP market players.

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