

Completing the Revolution

the Challenge of Rural Telephony in Africa





Above:
Women operators
at Somaliland Telecom's
exchange, Somaliland.
HAMISH WILSON/PANOS PICTURES

Cover:
A man using the
only phone in his village,
Malawi. Across Africa,
access to reliable telephone
services remains a luxury.
MIKKEL OSTERGAARD/PANOS PICTURES

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Satellite images of the world and Africa at night. The lack of electricity is excluding much of Africa from the communications revolution.
SOURCE: ESRI LIGHTS AT NIGHT

Introduction

Communication is widely seen as an essential part of – and a tool for – development. But in the recent excitement about bridging the ‘digital divide’ and promoting Information and Communication Technologies (ICTs) for development, it is often forgotten that most rural Africans do not yet have access to a basic telephone service. For instance, in rural areas of Malawi there is only one telephone for every 1,250 people. The World Summit on the Information Society (WSIS), which aims to create an inclusive information society, made no specific reference to basic telephone services in the Declaration of Principles and Plan of Action that were agreed at its first meeting in Geneva in December 2003. Yet without this basic infrastructure, it is doubtful if many of the internet-based ICTs that WSIS focuses on can be made available to rural areas.

Since the mid-1990s and the World Trade Organisation’s Basic Telecommunication Services Agreement (BTA) of 1998, national telecommunications providers, which were often inefficient and burdened with outdated technologies and infrastructure, have lost their monopolies. Competition from private providers is intended to increase efficiency, speed up the introduction of new technologies and bring down costs, with the assumption, often unspoken, that this will gradually lead to the provision of services in rural areas. New technologies, particularly mobile phones, have greatly simplified the provision of services and reduced the costs of infrastructure, and the spread of mobile phones in Africa has been very rapid – the number of mobile users has multiplied by 131 times in only six years in Uganda, and mobile users outnumber fixed-line customers in many countries.

But most of this growth has been in urban areas, leaving a widening communication gap between rural and urban communities. Mobiles are still expensive to buy and use for poor and rural people. Besides, since many governments have delayed full liberalisation in order to protect their incumbent telecommunications providers, the full potential of competition has not yet been seen.

The slow progress in rural areas is often hidden – for instance, rural statistics are not disaggregated from overall national statistics. This both reflects and contributes to the lack of priority given to the sector.

This Panos Report examines the progress towards universal telephone access in Africa and outlines some fundamental questions: whether mobile telephones will provide the solution for rural areas or whether fixed lines should still be the goal; whether governments have done enough to liberalise the market and allow competition; and whether, ultimately, the market will provide access for rural people or whether this sector needs significant subsidy, in the same way as roads and other essential services are generally subsidised. The report calls for much more attention to be paid in national and global policy-making to providing rural telephony – for instance, in the second stage of WSIS in 2005. If this is not done, rural Africa will continue to lag behind and that, in turn, may undermine the achievement of the Millennium Development Goals.

Mobile phone advertisement in Sudan. Africa's telecoms growth has been fuelled by a rapid rise in the number of mobile phone users. SVEN TORFINN/PANOS PICTURES



Telephones and rural development

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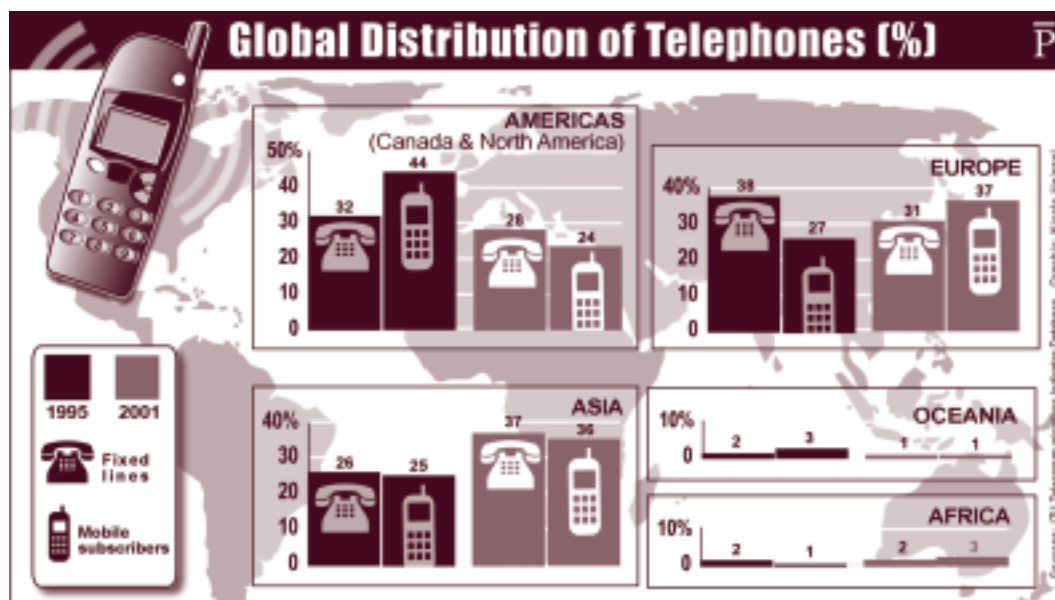
Telecommunications were long ignored as a development tool by theorists and development planners, but now ICTs are increasingly seen as a key element enabling development. Among the many ways telecommunications contribute to development are: facilitating social change and economic activity, improving quality of life, bringing cost-benefits in rural social service delivery, speeding up other rural and community related development activities, enabling political participation and claiming of services, and promoting good governance and transparency.¹

As well as being a tool for development, communication is also seen by many development activists as a right – the ‘right to communicate’ – which requires access to ICTs as well as freedom of speech. Much of the recent debate and many practical experiments about the role of communication focus on new internet-based ICTs and whether or in what circumstances these can be made available and useful for poor and rural people. It is sometimes forgotten that the rural poor, though left out of the ‘digital communication revolution’, have also to a large extent been excluded from the older means of communication – telephones as well as mass media, motor roads, transport and all aspects of modern communication. Many innovative ICT projects such as rural telecentres for accessing the internet have failed simply because the basic telephone connectivity they need in order to function was absent or unreliable. And many development experts argue that telephones should in any case be the priority – they are more easily used and more useful than the internet, require no special skills or languages, and are completely ‘horizontal’, without problems of irrelevant or externally controlled content.

How can telecommunications be made accessible to the poor in rural areas of developing countries? There are no easy answers because the infrastructure investments required are so large.

In colonial and post-colonial times, telephones in most countries were provided to cities and a few key points along main routes in and around the country. But the cost of establishing the infrastructure precluded provision of telephones to the whole country – particularly in Africa, where distances are large and populations relatively thinly spread. Besides, telephones were seen as a luxury, a tool of the elite. Because they were also strategically important they were provided and run by the state – there was usually a single government-owned provider.

¹ For a detailed discussion, see Hudson, Heather E *When Telephones Reach the Village: The Role of Telecommunications in Rural Development* (Alex Publication Corporation, Norwood, 1984)



In most countries the privatisation of telecommunication sectors began in the 1980s and 90s – decades marked by increased liberalisation and reduced state involvement in economies. The rationale was that government-owned monopoly providers were inefficient and unable to keep up with technological developments, while privatisation would bring in competition and new investment. To some extent, there was an assumption that this would lead to an increase in overall telephone growth, including in poor and rural areas. But this was not the primary reason – more important was the expectation that reduced costs and improved services would facilitate (urban) economic growth and make cities attractive to foreign investors.

Technological developments also raised hopes for universal coverage. Mobile systems require far less burdensome infrastructure and seem well adapted for bringing coverage to wide areas. Many governments wish to provide 'universal access' and are developing strategies in which this is to be provided by private mobile companies.

Both these assumptions need to be examined. First, privatisation tends to improve provision in urban areas but not to address the requirements of rural areas. New providers compete for urban markets, while rural areas are still seen as unprofitable – investment costs are high, and there are too few users and/or too little use to recoup the investments. Second, mobile phones may not be the solution for rural users, because although the initial installation is cheaper, they are expensive for users – the cost of equipment and calls are generally higher than with fixed-line systems. As a result, even when telephones become available to rural people, if they are mobile-based, they may end up being little used.

Enthusiasts of new technologies argue that it is only a matter of time before new technologies are adapted and costs come down sufficiently to meet rural needs and capacities to pay (see *The benefits of full liberalisation*, page 15). They point to the rapid spread of mobile phones as evidence of a pent-up demand and people's willingness to pay for communication. Others argue that mobiles are by definition designed for a wealthier and urban market, and that the goal of governments – a developmental goal – should continue to be the provision of fixed lines to all rural users, as these may still be cheaper to use and easier to manage. On both sides, there is a range of views about how provision should be financed – whether the market alone can provide cost-effective access, or whether some type of government incentive or subsidy is needed.

At present these debates are not at the centre stage of most telecommunications discussions and policy-making. There is more concern with new technologies and services, new investment and competition, and the challenge of rural coverage is often left unaddressed. Telecommunications is viewed as an economic rather than a development sector. Most governments have formal commitments to providing 'universal access', but few are actually implementing the measures needed to provide this. National and international teledensity figures are not usually disaggregated into urban and rural, so the rapid growth of urban use conceals what is often a rather stagnant picture of rural telecommunications development. For example, the teledensity of Malawi is one in 200 on average for the whole country. But if one takes out the number of telephone lines for the four major towns, the country is left with 8,000 lines for 10 million people, giving a rural teledensity of one telephone line for 1,250 people. Lack of data on rural access hampers development and policy debate, and rural perspectives are rarely heard.

For some development policy-makers this situation is acceptable. They do not see rural telephony as a priority – and it is true that the impact of telephony on development has yet to be conclusively demonstrated. (Most rural use of phones at present is for social purposes, such as the announcement of births and deaths to family members and dealing with transfers of money from migrants, rather than for what would usually be regarded as ‘development’.)² Other policy experts see the neglect of rural access as a serious omission, for they believe that if phones were more accessible and cheaper their development value would rapidly become evident: they would stimulate economic opportunities, service provision and political engagement as well as social bonds.

This report aims to throw a spotlight on the question of rural access. It looks at the patterns of rural telecom growth in the light of the promising overall growth of telephony, and at the actual situation of rural provision in four countries in Africa – Uganda, Senegal, Burkina Faso and Zambia. The selections are random and each country is unique in the way it has embraced telecommunications reforms.

Rural telecommunications policy should not be made by default, nor should it be made by technical ministries in isolation: it should be the subject of thorough and well-informed debate involving all stakeholders, including development donors, other areas of government, media, civil society and the rural and poor themselves. This report aims to inform such dialogue and contribute to putting communications issues at the heart of national and international development thinking.

The commitment to universal access

Universal service means, in principle, that every household has a telephone. Universal service has been a traditional objective of telecommunications policies, and according to a 1998 survey by the International Telecommunications Union (ITU), 138 countries around the world had a Universal Service Obligation. In developing countries, however, the goal has remained difficult to achieve, and so the concept of ‘universal access’ has come into use. This means that everyone should be within reasonable distance of a telephone (the definition of ‘reasonable’ is left to each country to decide).

Current thinking is that universal service and/or universal access will be provided largely by the market, but that if the market fails or is likely to fail to meet the objective on its own, governments will intervene through regulation or funding. The way this is implemented can vary from country to country. Even in prosperous countries such as the UK and USA, not all customers can afford to pay, and distance is an obstacle everywhere. A conference on connecting rural America organised by the Federal Communications Commission in January 2004 concluded that there were still people left unconnected and emphasised the need for boosting rural-specific satellites to cover health, safety and agriculture in remote areas.³

²
For interesting recent research on use of telephones in rural Africa, see *Innovative Demand Models for Telecommunication Services*, (<http://www.telafrica.org>, Gamos Ltd, accessed 14 April, 2004)

³
Federal Communications Commission, USA
Making the Rural Connection, press release January (<http://www.fcc.gov/cgb/rural/ruralforum.html> accessed 31 April, 2004).

In Finland, which has a well-functioning, competitive market and more phones than people, the government sees its duty as being to provide income support to the poorest households to help pay for such basic needs as food, electricity, television licences – and telephones.⁴ In Ireland, the Department of Social Welfare provides free telephone rental for elderly and disabled people living alone.⁵ In the UK, the universal service objective is reflected in the fact that fixed telephone connections across the country have a uniform price. British Telecom, the largest telecom company in the UK, allows unlimited incoming and outgoing calls to emergency and customer repair services and has 'soft disconnection' schemes for low-income groups – so that people are not too harshly penalised for failure to pay their telephone bills.⁶ Agricultural cooperatives built rural telephone facilities in parts of Brazil in the 1970s, and local cooperatives provide telephone service in Bolivia and Finland.

In addition to basic access to telephones, authorities sometimes identify other services that must be provided, though at full cost, to any customer requesting them. For the US, which has about 65 lines per 100 people, universal service includes touch-tone dialling and access to long-distance calls for low-income customers. Universal service objectives are likely to change as market boundaries are pushed outward – that is, services that begin as luxuries (such as mobile telephones or electronic mail) are widely adopted and come to be regarded as necessities. Egypt has taken the goal of universal service even further, providing a system of subsidies that creates low-cost, almost ubiquitous access to the internet over the telecom network.

Most developing countries seek to achieve universal access through communal facilities within the reach of a large number of people. Burkina Faso, near the low end of the range of network development with only 0.3 telephone lines per 100 inhabitants, aims to have pay phones within a distance of 20 km of most people.⁷ The goal of Grameen Telecom in Bangladesh is to have one telephone accessible within a 10-minute walk for every villager. Countries with more extensive networks aim at a telephone in every home, or more. In Colombia, with about 14 lines per 100 people, basic telephone service is being extended to low-income urban households.⁸

Objectives may also be tied directly to government goals for decentralisation of governance to regional and district levels in order to provide more effective social service delivery and local decision-making. Decentralisation requires that frontline service delivery agents and local government officials have access to affordable and effective communication and information-sharing tools.

Traditionally, universal access has been seen as a welfare issue: telephones facilitate the delivery of services. Many development communication activists now argue that access should be considered a right, rather than a welfare benefit – part of the 'right to communicate'. Whichever approach is taken, the fact is that universal access is a long way from being achieved in most countries in Africa.

4, 5, 6, 8

Wellenius, Björn
*Extending Telecommunications
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Public policy for the private
sector, Note No.206 (World Bank,
Washington, DC, 2000).

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*At a Symposium on Access
and Universal Service Access,*
Asia Pacific Telecommunity
([http://www.aptsec.org/seminar/
meeting2004/USO/INF_
Nepal_Universal%20Access
%20and%20Universal%20
Service%20obligation%20
country%20paper.doc,](http://www.aptsec.org/seminar/meeting2004/USO/INF_Nepal_Universal%20Access%20and%20Universal%20Service%20obligation%20country%20paper.doc)
accessed 31 March 2004).

Sub-Saharan Africa has about 10 per cent of the world's population (626 million), but only 0.2 per cent of the world's one billion telephone lines. Comparing this to all low-income countries (home to 50 per cent of the world's population but only 10 per cent of its telephone lines), the penetration of phone lines in sub-Saharan Africa is about five times less than that in the average low-income country.

The fixed-line teledensity for Africa increased slightly from 2.07 in 1997 to 2.77 in 2002 (including negative growth in six countries). Overall, the number of fixed lines increased from 12.5 million to 21 million across Africa between 1995 and 2001. Northern Africa has 11.4 million of these and one country alone – South Africa – accounts for 5 million, leaving only 4.6 million for the rest of the continent.

Most of the existing telecommunications infrastructure cannot reach the bulk of the population. Fifty per cent of the available lines are concentrated in capital cities, where only about 10 per cent of the population lives. In over 15 countries in Africa, including Cote d'Ivoire, Ghana and Uganda, over 70 per cent of the lines are located in the largest city.⁹ ICT infrastructures are essential for economic globalisation and accelerating international competition, and telecommunications systems have become a pre-requisite for attracting foreign direct investment – thus perpetuating the focus on cities. Analysts observe that ICT services are constructed in the same way as railway lines were at the beginning of the 20th century.¹⁰

Until recently, domestic use was largely confined to the small proportion of the population that could afford their own telephones. The cost of renting a connection averages almost 20 per cent of per capita GDP in Africa, compared to nine per cent for the world and only one per cent in high-income countries. The high cost of domestic connection is not offset by a higher proportion of public telephones: the number is still much lower than elsewhere. In 2001 the ITU reported about 350,000 public telephones in the whole continent, of which only 75,000 were in sub-Saharan Africa – or about one for every 8,500 people, compared to a world average of one for 500 people and an average in high-income countries of one for every 200.¹¹

Africa's new communication infrastructure is characterised by a focus on external rather than internal communication.¹² Not only are the majority of the phone lines located in the capital, but it is usually easier to place a call to Europe than it is to call a neighbouring town or even another district in the same city. The usage of international lines in Africa is relatively high compared to income levels, reflecting the large size of the African Diaspora and the often arbitrary nature of borders within the region. In 2000 African subscribers averaged 110 minutes of international outgoing calls per year, compared to a world average of 118, and 178 for high-income countries.¹³ While many telecom operators are beginning to reduce their charges for international calls (prompted by a growth in call-back services, where the receiver pays for the call because it is cheaper), the high tariffs and large number of international calls mean that despite their inefficiencies, African telecom operators enjoy substantial profits on their lines. The world average in 2000 was US\$942 revenue per main line per year; in Africa it was US\$868.

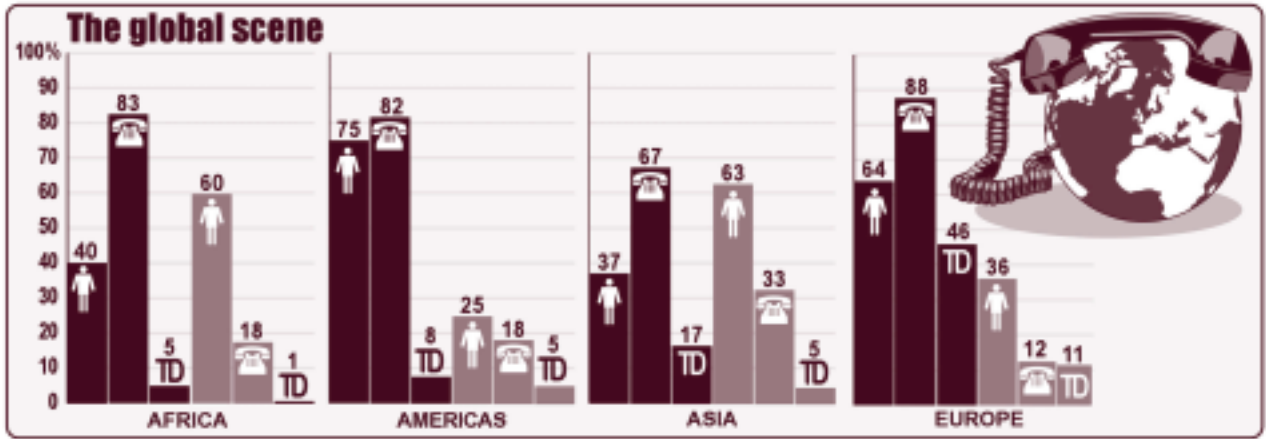
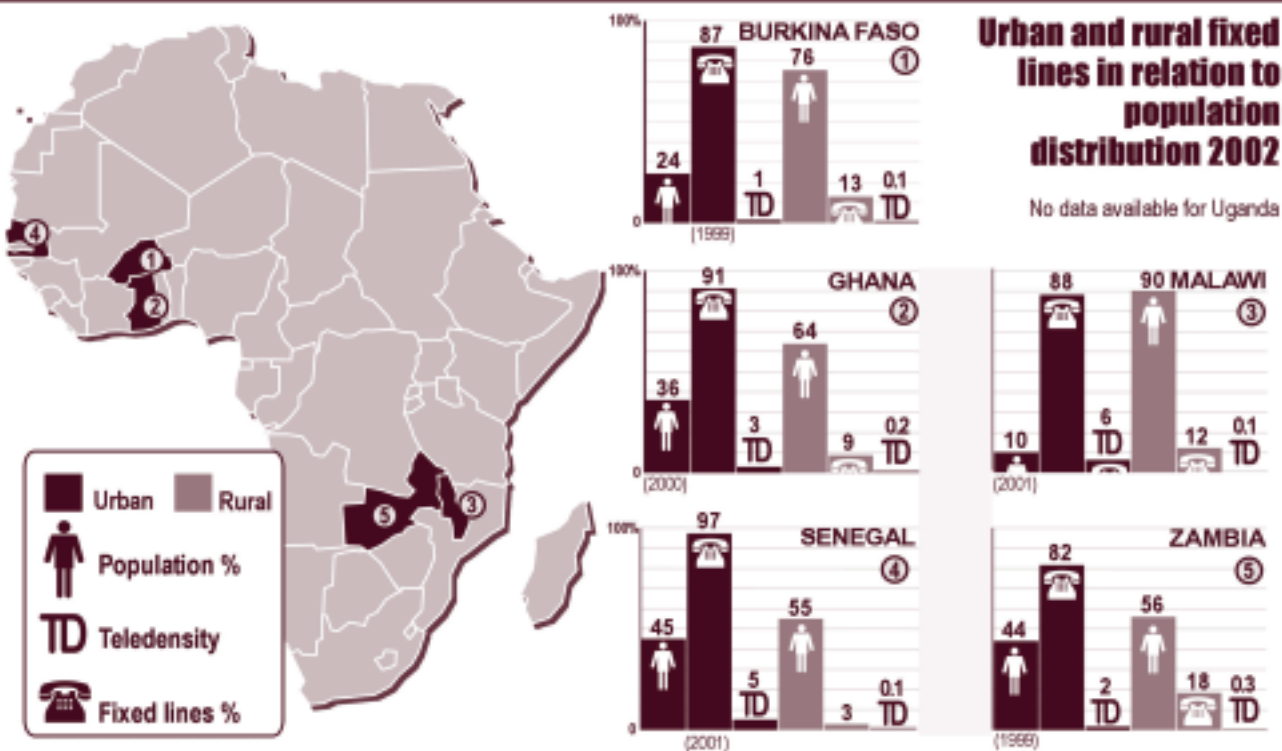
While most African fixed-line operators are at least partially privatised, there are a few exceptions, notably Nigeria, the Gambia, the Democratic Republic of Congo, the Comoros Islands, Sierra Leone, Liberia, Zimbabwe and Libya.

9, 13
Jensen, Mike (2002)
The African Internet – a status report
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Telecommunications Policy (2003),
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11
Telecommunications Indicators
Database, ITU, 2001

The great divide



Sources: ITU Telecommunications Indicator Database Graphic: Nicole Heinzl

The WTO and Telecoms

The World Trade Organisation's Basic Telecommunication Services Agreement (BTA) came into force on 5 February 1998. It is part of the General Agreement on Trade in Services (GATS), established in 1994, which itself is one of more than 20 separate trade agreements administered by the WTO. Under the BTA, WTO member states have pledged to open their telecommunications markets to foreign competition, allowing foreign companies to buy stakes in domestic telecom companies and abide by common rules. Fundamental principles include granting Most Favoured Nation status to all nations, so that no country, including the home country, can be accorded special treatment or privileges.¹⁴ The rationale is that competition will stimulate higher quality and more efficiency in the telecoms sector, and other operators might provide services more efficiently than protected and often government-owned monopoly providers. However, critics charge that the purpose of GATS was to force developing countries to open up their markets and provide new expansion opportunities to northern-based companies.

Governments make 'offers' of sections of their market and receive 'requests' for market access from other interested countries. When the European Union (EU) submitted requests to developing countries in 2002, telecommunications topped its list.¹⁵ Because EU development aid is crucial, developing countries are not in a position to refuse the 'requests'. Besides, the telecommunications sector is important for attracting other investment.

Regulation of the market is permitted under GATS: a member country can make one-off limitations on market access or grant favourable treatment to national suppliers for a limited period. However, governments must state these at the time of making offers, and agreements once made are binding and irreversible. Many developing countries do not have the expertise to predict the progress of services sectors, and they lack the capacity to negotiate with large and developed countries, especially in the ICT sector: the system thus puts them at a disadvantage.¹⁶

Premised on the need for telecommunications services to stimulate national growth, the BTA states that markets need to be deregulated – and National Communications Commissions are being set up by WTO member-states as a requirement.¹⁷ Southern monopolies (often owned by governments) have been deregulated and private providers have come into play since the late 1990s. They have often been limited initially to providing mobile phones. As a result mobiles have penetrated the market and overall teledensity has increased.

¹⁴ WTO agreement on Basic Telecommunication Services.

¹⁵ World Development Movement *Whose Development Agenda: An analysis of the European Union's GATS requests of developing countries* (WDM, London 2003).

¹⁶ MacLean, Don; Souter, David; Deane, James; Lilley, Sarah *Louder Voices, Strengthening Developing Country Participation in International ICT Decision-making*, (CTO & Panos, London 2002)

¹⁷ Arkell, Julian *Background paper on GATS issues: Global Dimensions* (London School of Economics, London 2003).

The spread of mobile telephones in Africa

In the past 10 years, mobile phone use has grown dramatically in Africa, overtaking fixed line services.¹⁸ This explosive growth demonstrates the pent-up demand for basic telephone services. Growth has been especially rapid in the past seven years, since telecommunications sector reforms in most countries opened markets to competition as a result of the Basic Telecommunication Services Agreement. Most countries in Africa have at least two cellular networks, one of which is government-owned. By the end of 2001, Africa had 104 mobile networks operational, serving over 14 million customers in addition to 10 million in South Africa. In South Africa today, the number of cell phone customers is more than triple the country's now-shrinking number of fixed lines. In Uganda, mobile phone subscribers multiplied by a factor of 131 between 1996 and 2002 – from 3,000 to 393,000 – and are now seven times more than the number of fixed-line users.¹⁹

By far the majority of the systems in use are now based on the digital GSM standard, although international roaming agreements are limited or not available on the older analogue systems that are still in use in many countries.

18
ITU, *Reinventing Telecoms: World Telecommunications Development Report* (ITU, Geneva, 2002).

19
Telecommunication Indicators Database, ITU, 2002.

Mobiles and the market: are they the solutions?

3

Will mobiles replace fixed-line systems?

There are many reasons for the increased use of mobile phones. One common reason is the low quality and unreliable service, as well as shortage, of fixed lines. Mobile phones also attract customers because they are convenient, sleek and portable, and carry social status. However, one study found that subscribers see their mobiles as a complement to, rather than as a substitute for, fixed lines.²⁰ On the other hand, the use of pre-paid cards by mobile users supports the view that a mobile is sometimes used as a substitute for fixed lines. According to the ITU, “many African customers would not be granted access to a phone of any kind if their credit status were checked first” – but pre-paid mobile connectivity overcomes this issue.²¹

Even though the costs of mobile phones are falling, they are still high compared to fixed-line phones, and so are unlikely to completely replace fixed lines. Mobile services are not picking up the slack where demand for fixed lines is unmet. The market for mobiles is a different one, and fixed-line operators should not expect a reduction in demand as mobile usage continues to expand. A recent analysis of the patterns in global fixed and mobile telecommunications development, based on data from 61 countries, found that consumers had turned increasingly to mobile services as a substitute for poor fixed networks despite their higher prices.²²

Can the market provide universal service?

Most international development actors argue that deregulating the telecommunications environment is a precondition for bringing Africa – particularly its rural and marginalised populations – into the information-driven economy. Under the BTA, every WTO member-country has to set up an independent regulator whose role is to promote competition and the market, the assumption being that a free and competitive market will ensure the provision of services to all potential users. Is this happening?

Telecommunications infrastructure requires significant capital, and it is not self-evident that the market will direct investment in the most socially beneficial ways. There is an annual funding shortfall of around US\$30 billion for the provision of basic telecommunications infrastructure in developing countries.²³ While other major infrastructures are generally subsidised by various national and international agencies, telecommunications infrastructure is expected to pay for itself and needs to gain a return on investment. The rural poor and marginalised are hardly seen as clients in this commercial picture. For example, private telecom providers in Uganda have not rolled out their services to all of the places they promised to, including rural areas, citing a lack of infrastructure and insecurity. Even if the rural poor are offered services, they may have to pay higher rates for them: due to poor teledensity in rural areas, the cost of local switching equipment per access line is many times more than in urban areas. In KwaZulu Natal, South Africa, for example, the costs of services in rural areas are at least three times those in cities.²⁴

Mobile operators provide access mainly in the capital cities but also in some secondary towns and along major trunk routes. Because of the low cost and long range of the cellular base stations, many rural areas have also been covered. However, the high cost of mobile usage (US\$0.20–0.40 per minute on average) makes it too expensive for most local calls or internet access. Thus actual penetration remains urban centric and cost-ineffective for poor rural households. The greatest concern advanced by fixed-line operators (and some development experts) is the possible marginalisation of the rural and the poor by private mobile operators.

20
Hamilton, Jacqueline
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Telecommunications Development
Report* (ITU, Geneva, 2002).

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Andrew, T N; Petkov, D
'The need for a systems thinking
approach to the planning of rural
telecommunications infrastructure',
Telecommunications Policy (2003),
vol 27, nos 1–2.

It is clear that countries with high income levels enjoy more telephone growth. Eighteen countries in Africa in which many people's incomes are less than a dollar a day have a telephone penetration of only seven phones per 1,000 people, with different levels of competition among providers.²⁵ Competition itself appears to have no significant impact on penetration, which depends rather on disposable incomes and, to some extent, on reduced tariffs. Regulators can reduce the tariffs, but they have no control over the economy and people's income levels. Therefore, exclusively market-based telephone penetration in low-income countries is very likely to exclude the poor.

Telecentres

National telecommunications operators in Africa are increasingly passing the responsibility for maintaining public telephones to the private sector. This has led to the rapid growth of public 'phone shops' and 'telecentres' in many countries. Senegal has been particularly successful, with over 10,000 commercially run public phone bureaus and employing over 15,000 people. Some provide internet access and advanced ICT services. Most of the centres are in urban areas, but a growing number are being established in more remote locations, including rural areas.

Many donor- and government-funded projects (known by different names: telecentres, telecottages, community media centres, information shops) are committed to demonstrating the value of telephones in rural areas for the poor and the marginalised. Experimental rural ICT projects have shown how the poor can improve their livelihoods with access to subsidised ICT services, and the same argument is applicable to rural telecommunications infrastructure as it greatly reduces the cost of running telecentres. One well-known telecentre in Pondicherry in India shows that rural users tend to use more and more telephone services in order to act on the information they have received from the telecentre, such as information on the placing and selling of agricultural produce. Users' data from Pondicherry reveal that telephony is one of the most preferred services at telecentres.

However, such experimental projects generally don't solve the problem of commercial viability – in a market-driven telecommunications environment, many projects like these can only be sustained with continued donor funding, and they do little to convince telecoms providers that rural markets can be profitable. The telecentre movement began with the aim of addressing exactly this problem. Governments and development activists – in Canada, Europe, Australia and elsewhere – saw market gaps arising out of telecom privatisation and set up telecentres to provide essential services, with a strong focus on connecting rural communities.

Some development experts now argue that telecommunications policies in Africa should similarly embrace development goals and reach out to include rural and marginalised people, even if this requires state subsidies. They argue that if the question of exclusion is not consciously addressed, information and communication technologies will become the domain of a few who have money and live in the 'right place', and wealth gaps will increase. Other infrastructures important for development – such as transport, electricity and water – are often seen as basic needs that the government is obliged to provide or at least facilitate, so why not telecommunications, they ask, which play such a major role in shaping modern societies? Besides, the scale of telecommunications infrastructure and the need for integration of telecoms with other services to provide an enabling development environment make it an appropriate field for overarching state guidance, rather than piecemeal private intervention.

²⁵ Mureithi, Muriuki
'Self-destructive competition in cellular: regulatory options to harness the benefits of liberalisation', *Telecommunications Policy* (2003), vol 27, nos 1–2.

RASCOM dreams

African countries are looking increasingly at regional efforts to promote ICTs because of the high costs of the telecommunications sector. Options such as VSAT – or Very Small Aperture Terminal – are important for connecting direct links by satellites not only among countries but also within nations in remote and rural areas.

The RASCOM (Regional African Satellites Communications) project is one such initiative in the area of telecommunications in Africa, providing for the establishment of a continent-wide system of satellite communications. An inter-governmental body founded in 1992 (it currently has 44 members) RASCOM aims to deliver cheap telephony, particularly in rural Africa, through satellite technology. It has entered into an agreement with the private company ALCATEL Spacecom to implement the programme. Together they are responsible for designing, financing, launching and operating the system, transferring the ownership to RASCOM and developing small low-cost rural terminals across Africa that could bring down the cost of making a national call to no more than US\$0.10.

Given the size of financial commitment involved (US \$18 million to start the work), the ambitious project is thought to be viable only on a continental scale.²⁶

Critics charge that the slow progress of this project is partly due to the unwillingness of western telecom operators to financially support the idea. This, they say, is because these operators view RASCOM as a potential threat – most communications in Africa at present pass through a European country, points out Hadji Maty Sene, head of the engineering department at SONATEL. Nevertheless, the project is on course for launching its first satellite in 2006 (delayed from 2002).

Paying for universal service access

To some extent this is what happens already. Governments generally place a high priority on promoting access to infrastructure by poorer and more remotely based citizens, and they recognise that the unaided market is not likely to provide rural telecommunication access. Until recently the economic structure of the telecommunications industry in every country in the world was based on some variant of cross-subsidisation from long distance and international service revenues to cover local costs in order to promote local access and affordability. As that model has become unsustainable under the twin pressures of technological developments and the WTO's regulations that prohibit any forms of subsidy, governments now search for new methods of subsidy to keep the costs of local service down. Most have decided to implement versions of a universal access fund, siphoning off revenues from carrier profits to fund network expansion rather than to artificially constrain prices for local service. They may also require private operators, as part of their operating licence, to meet specified targets for rural connection.

These methods are not proving enough to meet the challenge, as the case studies show. The funds raised by the universal access fund are not sufficient to cover the investments needed; and private operators are often unable or unwilling to fulfill their obligations. In Uganda, for example, there have been complaints that mobile providers tend not to roll out their services to all agreed areas because they have to operate in districts which do not have electricity.

²⁶ Polikanov, Dmitry; Abramova, Irina 'Africa and ICT: A chance for breakthrough?' *Information, Communication & Society* (2003), vol 6:1

How Vodacom is meeting its universal service obligation in South Africa

One of the cell phone operators in South Africa, Vodacom, found an innovative way to meet its universal service obligation. It established community service phone shops in refurbished shipping containers located in poorer communities. Phone shops are owned and operated by local entrepreneurs, have 5 or 10 phones linked to Vodacom's cellular network and offer pre-paid calls at a government-mandated rate that is less than a third of the commercial rate. The system is very popular and has grown to 4,400 phone shops and some 24,000 phones, which are heavily used by the communities they serve – typically, 100 hours of calling per month per phone. It generates jobs to staff the phone shops, profits for the entrepreneurs and revenue that covers Vodacom's fixed costs for the programme.

Satellite dish in Kampala, Uganda. New ICTs such as satellites can help deliver telecom and other services to remote and rural parts of Africa.

TRYGVE BØLSTAD/PANOS PICTURES



The benefits of full liberalisation: an expert's view

Low levels of economic development have limited the spread of communications infrastructure across Africa, but there is a massive pent-up demand for communications services. The explosion of mobile telephones bears witness to this: mobile subscribers now outnumber fixed-line users by 10:1 in some countries, despite the high costs of using mobile networks (the average revenue per mobile user in Nigeria, for example, is almost US\$50 a month – at nearly US\$600 a year, this is twice the country's per capita GDP).

The reason the demand is not being met is largely the fact that in most countries incumbent fixed-line operators have a monopoly. In most countries the incumbent national operators have recently been partially privatised, and a regulatory authority has been established. These are important steps towards opening communications markets. But policy change has not kept up with rapid advances in technology, and new regulatory strategies are required to ensure that new developments are made available to people in Africa.

Today, communication facilities can be provided cost effectively in virtually any remote or rural area due to plummeting costs, exponential increases in the power of digital equipment and technical developments in wireless and satellite technologies. These new systems no longer rely on old circuit-switched technologies, but are 'internet-enabled' or packet-based, so anyone who has a connection can share it wirelessly with anyone else nearby. This means that even small organisations and individuals in developing country rural areas can club together to obtain cheap access, especially where there is no existing telecommunication infrastructure.

Radio transmitters for broadband lines now cost less than US\$50. As a result hundreds of user-groups around the world are setting up their own wireless local area networks. In Indonesia a few million people have already hooked up to these systems and thousands of calls are placed over their network daily, using Voice over Internet Protocol (VoIP). Equipment for long-distance links using Ku-Band (high frequency) satellite transmitters and HF or VHF radio now costs only US\$1,000–US\$2,000. Satellite companies like Hughes, Panamsat, Intelsat and Ipstar are providing connectivity for less than US\$250 a month. When these two systems – local area networks and satellite transmitters – are combined, connections can be affordably brought to any remote rural area, with the cost being shared by anyone within reach, using cheap terrestrial radio connections.

Unfortunately, most governments in Africa do not yet allow people to set up telecom links in this fashion. Either they prohibit it directly, or they levy unaffordable licence fees. The pace of technology change has been so rapid recently that most policy-makers are unaware of the implications of these new developments. They still think in terms of traditional models of telecommunication development, which restrict market access to a few licensed telecom operators. The justifications for continuing this practice are to obtain high licence fees for government finance and to guarantee to the operators sufficient income to roll out infrastructure in under-served areas (and because they are still thinking in terms of the traditional model, the level of finance needed for infrastructure is high). Although this strategy may sound logical, experience has shown that the only way of ensuring efficient service delivery is to bring self-interest fully into play by opening the markets and using competition to do much of the regulating.

While greater competition and private ownership in the telecom sector may result in some overlap and duplication of resources, the overall operation of the sector will be more efficient than under a single monopoly. This strategy also helps address the fact that regulations are difficult to enforce: government policy-makers and regulators worldwide (even the US Federal Communications Commission) do not have the resources and capacity to argue against well-financed telecom operator lawyers or to keep up with technological changes in order to fully enforce regulations.

Developed countries had large incumbent telecommunication providers with large investments in old technologies servicing 99 per cent of the market. They needed to be transferred gradually into a competitive environment, with a large and powerful regulatory apparatus to protect them. African countries do not have the same large dominant incumbents, so they do not need the same powerful regulation: new operators should normally be able to self-regulate to a much greater extent.

The assumption that providing rural connectivity in developing countries is unprofitable needs to be seriously re-examined. The cost of bandwidth is plummeting, and now that telecoms links can carry valuable internet data and e-commerce transactions as well as voice calls, their added value is increased. The assumption that rural areas are unprofitable is used by those still in favour of limiting market access: they argue that revenues from the more profitable urban areas are needed to cross-subsidise access in rural areas. However, when the new dynamics are taken into consideration, along with often underestimated rural wealth levels (bolstered by remittances from the Diaspora), and the potential of locally owned wireless and satellite infrastructure, it is clear that policy-makers need to adopt new regulatory approaches to achieving rural connectivity.

In addition, the traditional source of funds for financing remote or 'unprofitable' areas has been revenue from international calls. This is now drying up because the market for international calls is becoming much more competitive, and more efficient VoIP systems are being used. The cost of international connectivity is dropping substantially because many more satellites are competing for custom over Africa, and because fibre or terrestrial microwave links are being built to connect African countries directly with one another. Through projects like the SAT-3/West African Submarine Cable (WASC) and Regional Internet Exchange points, operators in Africa are increasingly able to exchange traffic with each other directly. Previously calls between African countries were routed via Europe or North America, and it is estimated that African operators had to pay nearly half a billion dollars a year in transit fees.

Any initial privatisation and liberalisation of the telecom sector in this day and age should not simply shift a public monopoly to a private one, which can be even more difficult to control, especially if it has a large foreign backer. Even the strategy of retaining a limited exclusivity period (usually five years) for basic services in urban areas is nowadays in question, and it may be more efficient to move directly from a public monopoly to a multi-player competitive environment.

Governments can develop transitional strategies which allow their incumbent operators to retain their core business (operating the national backbones), while laying the groundwork for the next phase of competition. Such strategies should make it clear that competition ensures cost-based pricing and higher service levels without the need for strong regulation: this will help address fears that an open market will fail to deliver quality and affordable services.

The right policies for accelerating liberalisation of the African telecommunication industry will have the most profound impacts on the prospects for broadening access to communications. In a competitive market there are likely to be a variety of innovative ideas and opportunities for providing affordable communication and information services, as well as for encouraging local businesses to exploit the much larger information economies of the developed countries. Some of the new market arrangements that could occur in a liberalised environment include:

- Universal service or universal access obligations. Spread across a large number of operators, these will make it easier to connect public services such as schools and libraries to high capacity networks and services;
- Joint ventures between cybercafés/telecentres, fixed and mobile line operators and other investors such as e-commerce entrepreneurs. Such arrangements will be able to offer full-service ICT access, content and business venture options to rural communities, as well as 'telework' for developed countries;
- Specialised start-up companies, such as public payphone providers and Internet Service Providers (ISPs), which will establish new access points.

This will require governments not only to liberalise the sector but also to invest in education and training, and to take measures to cut input costs and consumer prices by supporting the development of local capital markets and other forms of finance, reducing import duties and speeding business registration, licensing and import clearance procedures.

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Uganda: a success story?

Anne Gamurorwa

CS1

Uganda used to be one of the least telephone penetrated countries in Africa. Not anymore. From a teledensity of 0.21 per 100 people in 1996, Uganda today has 2.5 telephones per 100 – one of the largest teledensities in the developing world. The World Telecommunications Development Report published by the ITU in 2002 notes that Uganda is a model for other developing nations. But the figure conceals lurking problems: mobiles, mostly used in urban areas, account for 2.2 of the teledensity. With fixed lines lagging behind with no more than 0.3 lines per 100 people, there are implications for rural telephony.

Poverty is extensive in Uganda. More than 82 per cent of Ugandans live on incomes of US\$1 a day and the figure jumps to 96.4 per cent for incomes of US\$2 a day, which makes telephones a luxury for the overwhelming majority.

Rural vs. urban

Eighty per cent of Ugandans (population 24.2 million, UNDP, 2003) live in rural areas, but an estimated 70 per cent of ICTs are in urban areas. Agriculture is the mainstay of the economy, contributing 42.1 per cent of the Gross Domestic Product (GDP).²⁷ Manufacturing and construction accounts for 15 per cent, while services contribute a third of the GDP of which the communication share is 0.5 per cent.

While urban Uganda is benefiting from ICT, rural areas still have difficulty in meeting basic needs such as nutrition, shelter, health and education. According to UNDP, the adult literacy rate is estimated at 68.8 (2001). This means that more than 30 per cent of the population cannot read and write, a skill that is necessary in most cases to access and use ICT services.

There is, however, growing evidence of success in infrastructure development and a growing consensus that new initiatives are needed to build on these successes. There is a realisation that improving infrastructure, such as roads, electricity and security, will lead to a growth of ICTs in rural areas. At present, according to a study by the World Bank, only 10 per cent of all roads that are in good condition are paved primary roads.

Legal and other bodies

The legal framework regulating the communications sector has two core components: the Telecommunications Policy Sector Statement of 1996, which stipulates what is to be done (including liberalisation, privatisation and regulation) and the Communications Act of 1997 which lays down how these tasks are to be achieved. In addition, the government has drafted a National Information and Communication Technology Policy Framework (National ICT Policy 2001), whose main goal is to promote the development and effective utilisation of ICTs over the next 10 years. The cabinet approved the draft in 2003, which is now awaiting debate and ratification in parliament.

Two important bodies in the telecommunications sector are the Divestiture Reform Implementation Committee (DRIC) and the Privatisation Unit. The DRIC is a cabinet sub-committee with overall responsibility for the implementation of public enterprise reform and divestiture. The Privatisation Unit is currently attempting to administer a sale of the government's minority stake in Uganda Telecommunications Limited on the local stock market.

Smart subsidies – Uganda’s route to universal service access

Uganda is one of the first countries in Africa to implement a universal access fund – the Rural Communications Development Fund (RCDF) – operating on principles emerging internationally as best practice for allocating ‘smart subsidies’ to private companies that wish to serve the universal access market.

‘Smart subsidies’ are operational in several Latin American countries and a small number of Asian countries. It is a way of financing rural telephony obligations from internal resources by charging a fixed amount (one per cent in Uganda) on the overall revenues of telecom providers. The revenues are ‘smartly subsidised’ to mobilise private sector investment into rural areas, by the offer of incentives to investors.

The universal access fund replaces the concept of enforced cross-subsidisation. The ‘smart subsidy’ concept is enshrined in the UCC’s Rural Communications Development Policy, which states that:

The RCDF shall be used to establish basic communication access, through smart subsidies, to develop rural communications. That is, the RCDF shall be used to encourage commercial suppliers to enter the market but not to create unending dependency on subsidy.

The RCDF administration studies and estimates the maximum subsidy required to allow an operator to serve a designated area or group of communities, and sets this out as the subsidy available to the winning bidder. Applicants are then invited to bid for a licence or service contract to meet specified service obligations in the designated areas. The licence is awarded to the bidder requiring the lowest subsidy.

The regulatory body, Uganda Communications Commission (UCC), was established under the Communications Act. Its main functions are to set national telecommunications standards; ensure service quality and equitable distribution of services throughout the country; establish tariff systems to protect consumers; promote competition; and license and monitor communication services.

The fundamental goals underpinning the government’s Rural Telecommunications Policy are set out in the minister’s policy statement issued annually. The main thrust of the January 1996 statement²⁸ was to bring about improvements in the coverage and the quality of services throughout the country by setting several targets, including increasing teledensity from 0.28 lines to two lines per 100 people;²⁹ and fulfilling unmet demands for telecommunications service. Another target was to ensure a balanced and well-coordinated network through appropriate licensing, regulation, standardisation and development of competition across a broad spectrum of telecommunications services.

²⁸

The ministerial policy statement provides the basis and focus of the current ICT plan, as well as the background to current reforms in the ICT sector.

²⁹

The ministerial policy statement for the year 2002/03 set a new target of 3 lines per 100 persons.

Telephone growth

According to data available from the UCC, the period 1998 to 2003 saw tremendous growth, especially in mobile telephony (see Fig 1). Mobile phone subscribers grew by an astonishing 5,800 per cent, from 12,000 in 1998 to 711,313 in September 2003 – as opposed to fixed lines, which grew by five per cent from 56,196 to 64,856 lines in the same period. The number of mobile operators increased from two to three and VSAT international data gateways from three to eight in the same period.

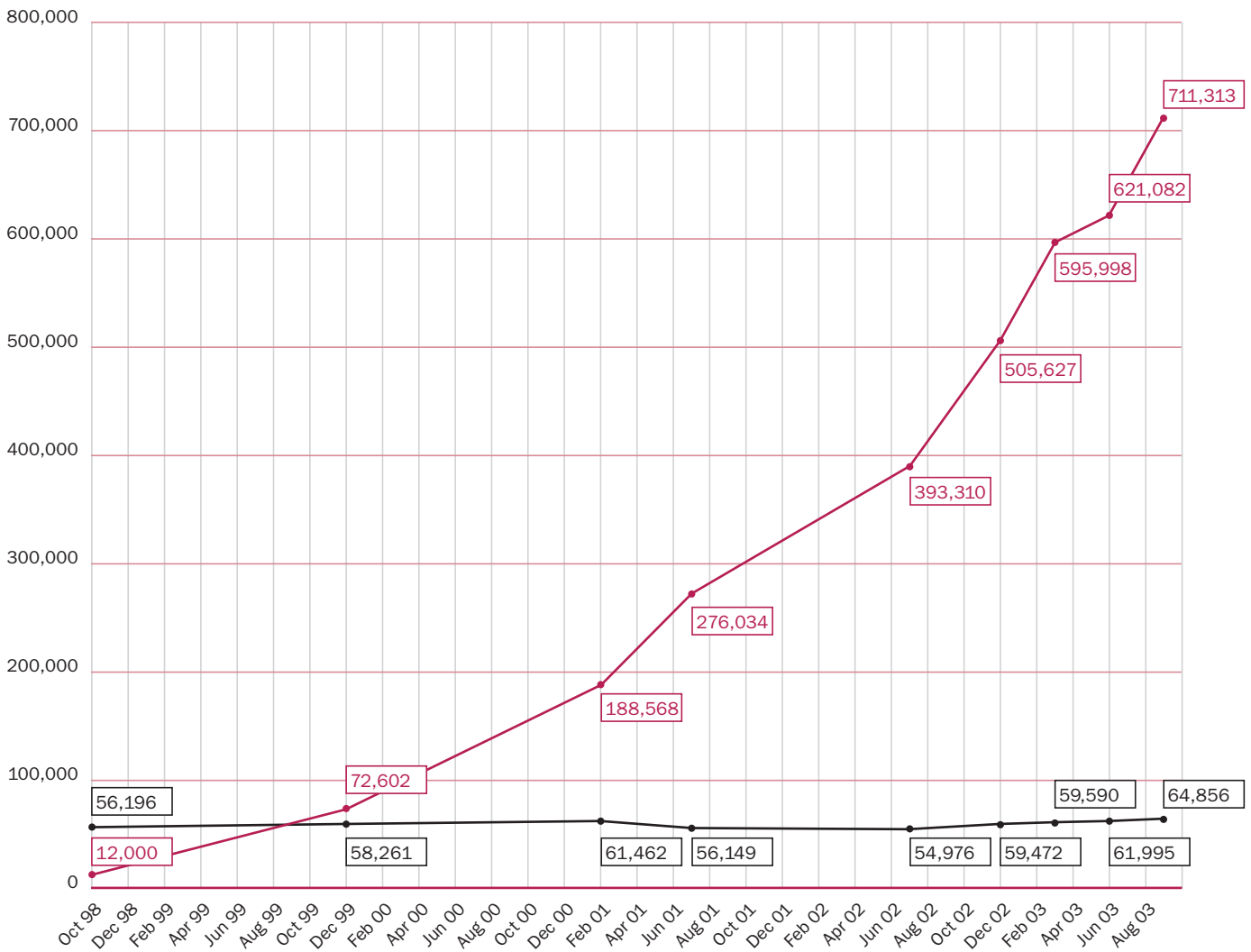


Figure 1
Fixed and Mobile phone growth
from Oct 1998 to Sept 2003

- Mobile telephone lines
- Fixed telephone lines

Source: Uganda Communications Commission Sept 2003.

Investment strategies

In an effort to improve investment policies and encourage rapid economic growth, the government has adopted a 'Big Push Strategy'.³⁰ The government sees its major role in Uganda's private sector-driven economy as providing security for people and property, a legal framework and physical infrastructure.

The key aims of the Big Push Strategy are to build ICT infrastructure; invest in ICT human resources development and provision of ICT-enabled services; and establish joint venture companies for software development and software exports. It also aims to foster gender participation in ICT, promote local assembly of ICT equipment and website development, and set up telecentres, internet cafes, ICT training facilities and film production centres.

The Uganda Investment Authority (UIA), created in 1991, is the statutory agency responsible for promoting and facilitating investments, both local and foreign. Uganda imposes no limitations whatsoever on foreign investors and allows 100 per cent foreign ownership of investments. Foreign investors are also free to repatriate their capital out of Uganda.

Universal access

The Communications Act, alongside the operator network roll-out obligations embedded in the operating licences, provides a basis for promoting universal access and rural communications development. This is implemented by collecting one per cent of annual revenues of telecom operators to administer a Rural Communications Development Fund (RCDF), which aims to ensure that basic communications services of acceptable quality are accessible at affordable prices – and at reasonable distances – by all Ugandans.

Company	Tax to Government (Fiscal Year) US\$ (millions)	
	2001/2002	2002/3*
UTL	4.68	na
MTN	14.96	na
CELTEL	1.60	na
MTN PublicCom	0.37	na
Bushnet (U) Ltd	0.39	na

Table 1
Tax revenues to Uganda government from leading ICT providers

Source: New Vision

Note: In the absence of the net profit figures for the ICT providers, tax to government can be used as proxy.

* Figures for 2002/3 unavailable

Vanguard institutions

The Rural Communication Development Policy of 2001 uses the term 'vanguard institutions' to denote organisations establishing (through donor funding) pilot programmes for providing computers and internet access in rural areas. The most common examples are schools and hospitals. Because of their remote locations, many vanguard institutions are being fitted with VSAT systems.

The UCC, with the support of USAID, the American government's aid agency, has begun a joint training programme aimed at helping the UCC to take on the challenge of regulating one of Africa's most liberalised telecom sectors to allow competition. Under this programme several telecentres have been established in eight primary teacher training colleges and 15 secondary schools.

But the UCC has not yet actively addressed all its responsibilities. In particular, it has not developed a tariff methodology (other than utilising prices proposed in winning privatisation tenders as caps); interconnection standards and procedures have not been specified; and monitoring and enforcement is weak because of its vulnerability to politically motivated interference (due to financial dependence on the government).

For instance, interconnection is obligatory once a telecommunications company has been issued with a licence to operate in the country, but the UCC is failing to implement it. The national telephone service providers are required to extend services to rural areas, but only a few peri-urban centres are served. They are obliged to install a pay phone in all county headquarters, provided the headquarters have road access, power availability, existing infrastructure capacity in close vicinity and the area is safe. The service providers cite lack of infrastructure, such as roads and power, insecurity and low effective demand for their failure to extend services to some rural areas.

Senegal: the public service challenge

Baba Thiam

CS2

Senegal is unusual among sub-Saharan African countries in that more than 70 per cent of its population is accessible by phone. Teledensity has grown from 0.6 per cent in 1990 to 2.5 per cent in 2000, and it is second only to South Africa in terms of quality of coverage.

More than 40 per cent of Senegal's population of 10 million lives in cities, half of them in the capital Dakar. The country is ranked 156th poorest of 175 states (UNDP, 2003): 67 per cent of the population lives on incomes of US\$2 a day (UNDP, 2003).

SONATEL (Société Nationale des Télécommunications) has a monopoly of fixed lines until July 2004, while mobile phone provision is subject to limited competition between SONATEL's subsidiary SONATEL Mobiles, launched in 1996, and a private provider, SENTEL (Sénégalaise des Télécommunications) which started in 1998. SENTEL is a subsidiary of Millicom International Cellular, which owns 75 per cent of the capital, the rest made up of Senegalese private finance. An independent regulator, ART (l'Agence de Régulation des Télécommunications) was established in 2001 to guarantee fair competition in compliance with WTO regulations.

The number of mobile phones multiplied by 150 times in less than five years, reaching 600,000 in 2003. The regulator has agreed to double the frequency available from 900 to 1800 MHz in order to allow improvements in the capacity and technical quality of the network.

SONATEL Mobiles has 80 per cent of the mobile market, and covers 85 per cent of the country.

Partial privatisation, poor public service

SONATEL is the sixth largest telecommunications enterprise in Africa, with a turnover of over US\$297 million and net profit of nearly US\$84.7 million in 2002. Created in 1985 by the merger of the Office of Post and Telecommunications and the state-owned Telesenegal, SONATEL became a limited company in 1997. In 2003, France Cables and Radio (FCR), a branch of France Telecom, owned 42.33 per cent of the capital, the government 27.67 per cent, the public and institutions 20 per cent, and present and former employees 10 per cent.

SONATEL pays out around US\$96 million every year in taxes, and between 1997 and 2004 invested US\$648 million and paid more than \$111 million in dividends to the state. Above all SONATEL is profitable for France Telecom. According to Olivier Sagna of the NGO OSIRIS (Organisation of Students for Information and Reflection on Interdisciplinarity and Sustainability), "As well as the profits France Telecom makes as a shareholder, it offers technical assistance to SONATEL, who have to pay for these services. It is hard to know how much money is repatriated." Some critics are asking whether the profits that are repatriated to France shouldn't be invested instead in Senegal. Senegalese economist Makhtar Diouf also wonders whether it is appropriate to talk of privatisation in this context, since France Telecom is 65 per cent owned by the French government.

In any event, the privatisation of SONATEL has not created real competition. According to Amadou Top of OSIRIS, SONATEL has functioned almost as a monopoly since 1997. It possesses the entire landline network in Senegal, and SONATEL Mobiles retains a monopoly on international calls until 2006. Several internet providers which had started up have disappeared because SONATEL charged them exorbitant rates, while giving preferential tariffs and direct access to its own subsidiary.

Senegal's privatisation of telecommunications and other public enterprises began in the mid-1990s but had been encouraged long before that by international financial institutions. According to Amadou Top, "We embarked on this era of liberalisation and deregulation as if all countries had the same level of development of telecommunications, whereas they have neither the same level of development nor the same established support structures, nor the same needs."

Some Senegalese experts hold that telecommunications being a strategic sector, governments should create policies that both stimulate and regulate service providers in order to meet the development needs of the country. But since December 2001, there have been no significant policy or strategy initiatives in Senegal. The rules and regulations are unclear, says Cheikh Tidiane Ndiogue, Director of NICT Research, Planning and Cooperation in the Ministry of Information. From reading the available official documents, he says, it is difficult to understand exactly which section of the government is responsible for enforcing rules and regulations. One view is that the sector suffers from three serious handicaps: absence of policy and strategy, lack of clear rules and institutional roles, and lack of a clear regulatory framework to foster competition.

SONATEL's monopoly officially ends in July 2004, but according to Mr Ndiogue it may continue in practice for at least 18 more months, because the state has not yet begun all the work needed to resolve essential technical, juridical and financial issues or create conditions for granting private operators direct access to the local loop. The delay may be partly because under the WTO, the government is not required to end SONATEL's monopoly until December 2006.

Civil society and communication policy experts are demanding an open debate on these and other questions that will shape the competition environment in Senegal.

Rural telephony today

The contract signed with France Telecom in 1997 foresaw connecting 1,000 villages each year. But seven years on fewer than 1,000 villages have been connected – from a total of 13,400 villages. Hadji Maty Sene, head of the engineering department at SONATEL, agrees that this seems a small number, but insists that it is acceptable given socioeconomic realities and when compared with other countries in the subregion. Olivier Sagna of OSIRIS, however, finds the rate of connection too slow.

SONATEL recognises the development value of telephones. "They save time spent travelling, and help in dealing with emergencies," says Mr Sene. "We note the crucial need for communicating with emigrants... Emigrants invest enormously in their places of origin, and the telephone is a practical way of supervising these investments. It enables the local population to attract investment."

According to Mr Sene, the rural telecommunication sector should be given preferential treatment, such as tax concessions, since the investment needed is far greater than for urban areas and is not profitable. "Rural zones are characterised by low population density, low telephone traffic and, therefore, low revenues." And the costs of running the network are high: a technician might have to travel 100 km to repair a fault, taking all day.

The target in the privatisation agreement was to bring a telephone line within 5 km of all Senegalese, and then to within less than an hour's walk. But these are far from being met – at present, SONATEL has set itself the task of connecting the 2,170 villages that have populations of more than 500. It has given a phone to all district centres but there is still much to do.

Life in the villages: some snapshots

The village of Mbey, 210 km from Dakar, with a population of 40, is so isolated it sometimes seems to be cut off from the rest of the world. The chief's brother had a mobile phone, given to him by a nephew who lives in Italy. It was the pride of the village and served as a public phone. But it was stolen, and now people have to walk 5 km, often under the burning sun, to the nearest telecentre to speak to friends or relatives. The task often falls on children.

In the district of Keur Momar Sarr, 84 villages are served by just 50 phone subscribers and seven telecentres. The fixed-line connection is poor, and it is difficult to make calls at weekends due to heavy traffic (call charges are cheaper at weekends).

The village of Keur Bakary Diop, with 100 inhabitants, doesn't have a phone at all. When people had to travel 15 km to reach one, their use of it was limited to announcing deaths and baptisms. But now a telecentre has been set up at a village located 8 km away. And a couple of mobiles have appeared in another nearby village – one was left by a man returning to Europe and the second was gifted by a friend. Children have the responsibility of responding to phone calls – they run about the paths to alert villagers. There is no electricity and when the batteries run out people go to the nearest villages with solar energy. These personal mobiles have become important community tools.

In Koumpentoun, 400 km from the capital, Mamour Mbodji set up a private telecentre 10 years ago. Mr Mbodji estimates that people come from surrounding villages 20 km away to make or receive a call. But the network doesn't work very well beyond distances of 10 km. He does not charge for receiving calls, unlike most telecentres. It is a way of gaining the trust of his clientele.

Abidouna Diallo manages his father's telecentre in Sadetou, to which people come from as far as 50 km away. Many of the incoming calls are from abroad as many people from this area have emigrated – mostly to Gabon or Europe. Most of the calls are about financial transactions. Some locals have been given mobiles by their relatives abroad but this area is not covered by a mobile network, so these phones are useless.

Mobiles may not be the ideal solution, given the cost of equipment and calls, the absence of a network in some areas, the need to recharge batteries (which requires an electricity supply) and the vulnerability of handsets to theft. However, Hadji Sene is cautiously hopeful: if the power supply problem is solved (antennas consume too much electricity to be powered by solar energy), he says, a single GSM antenna can cover many villages.

The other issue is charges. Mr Sene says: "Some satellite operators are proposing to charge one dollar per minute; in neighbouring Mali people are billed nearly twice that. I don't think we can charge that much in Senegal."

There are alternatives. For instance, three years ago officials from the American satellite society Iridium came to Senegal and demonstrated their system in the rural community of Bandia, 40 km from Dakar. With the imposing telephone in his hand and the antenna pointed skywards, the village chief spoke to a member of his family in Europe. Alternative technologies are available but the bureaucracy in the regulatory authority can be an obstacle in making these services available to the people.

Burkina Faso: coping with poverty

Sylvestre Ouedraogo

CS3

Burkina Faso's population of 12.3 million is 80 per cent rural, and has a literacy rate of 24.8 per cent (2001). The country is one of the poorest in the world, ranking 173 out of 175 in the 2003 UNDP Human Development Index, with 85.8 per cent of the population living on incomes of US\$2 or less per day.

Eighty-one per cent of telephone lines are in the capital Ouagadougou, and only 170 of the 300 districts in the country are covered by a fixed telephone connection. Mobile connections reach a few fortunate villages and the costs are exorbitant.

Three actors make up the telecommunications sector: ONATEL (the National Telecommunications Office), with its mobile subsidiary Telmob, and two private mobile services, CeTel and TeleCel.

ONATEL was partially privatised in 1998, following an ITU study which judged that a traditional monopoly operator would not be able to keep up with developments in this complex and dynamic sector, especially with the advent of new ICTs. ONATEL's monopoly of fixed lines, fax, telex, telegram, international links and satellite access lasts until December 2005. This is to give it time to adapt to competing with private operators who are generally more experienced, as they are subsidiaries of major continental and international companies.

Telmob, the mobile subsidiary of ONATEL, was established in 1996 – at the same time as the country gained internet connection – and has approximately 37 per cent of the mobile market. Of the two private operators, CeTel is a subsidiary of MSI Cellular Investments Holdings BV, a Netherlands-based holding and finance company operating in 10 African countries. It launched operations in Burkina Faso in January 2001 and covers 24 regions, with 40 per cent of the market share.

TeleCel, originally a subsidiary of Telecom International (the first mobile operator in Africa), began its operations in Burkina Faso in December 2000 and now has 22 per cent of the market share. Since August 2003 it has been part of the Atlantic Telecom group of Cote d'Ivoire.

The majority of capital in these companies is private. The investment policy of Burkina Faso was designed to attract foreign investment – companies get tax exemption for the first five years and can repatriate profits.

The arrival of mobile telephones produced a boom in the telecoms sector. ONATEL limited its opening of lines saying it wanted to allow the new operators time to get established. But at the same time it constrained them in several ways: public services were only allowed to subscribe to TelMob, public phone lines could only call TelMob numbers and private operators had to pay more for access to international lines.

A national regulator, ARTEL (Regulatory Agency for Telecommunications), was established in December 1998. It has granted two operating licences and resolved several legal cases – in favour of private operators. ARTEL ruled that private operators should get the same benefits as other providers, such as reduced international tariffs at certain times of day, and that all the services should be accessible from public phone booths.

The government made attempts to end rural isolation in the 1960s, offering to connect villages if they contributed labour and wooden telegraph poles – and many villages were connected in this way. But the system declined for various reasons, according to Mousbila Sankara, president of the Sodeptel association (Solidarity, Development through Telecommunications in Burkina Faso). Deforestation made it difficult for villagers to provide poles; ONATEL's old systems reached the limits of expansion; and real costs of installation increased while the amount the villages were paying remained negligible.

Universal access strategy

A policy commitment to developing rural telephony is mentioned in most of Burkina Faso's general policy documents – such as the poverty reduction framework and the national strategy for development of new technologies. A strategy for universal access to telecommunications was adopted in March 2003, defining universal access as “a minimal supply over the whole country of affordable telecommunication services in line with principles of equality, continuity and universality”.

The 2001–05 plan for development of national information and communication infrastructure aimed to increase teledensity to one line per 100 people by 2003, bringing it up to 1.66 by 2005; and to equip five per cent of Burkina Faso's 8,000 villages with at least one line by 2005. Due to lack of financial resources, however, Burkina Faso is unlikely to achieve four lines per 1,000 inhabitants in rural areas before 2013. One alternative would be to deploy GSM mobile phones in rural areas.

However, the cost of a single call on a mobile phone is half the daily wage of an agricultural worker in Burkina Faso. Only the well-off can benefit from mobiles, and once their needs were met, there would be little by way of profits to interest other operators. The extension of mobiles in rural areas could reduce the incentive to provide fixed lines (which are expensive to install but cheaper for users) or wireless systems.

At present CelTel is proposing a mobile public phone service, but has not yet rolled it out in rural areas. The post would run from a rechargeable battery, its reach would be large and the costs of installation relatively low. One disadvantage is that it would not be able to handle transmission of internet-type data.

The few fortunate villages that are within the footprint of the mobile phone service – mostly around towns or along the main roads – are often unaware of the fact that they have this service. It's only when someone happens to visit the village with their mobile switched on and receives a call that such information spreads. Under these circumstances, it may be difficult to convince people living in rural areas to take out a subscription.

However, the costs of mobile calls could be brought down if the government offered subsidies for operators in rural areas. ARTEL documents consulted for this case study do not make any mention of positive price discrimination, which may mean that mobile operators at present are focusing on urban centres.

The government, in order to promote universal access, requires operators to facilitate access in villages that are not connected. In addition operators are required to contribute two per cent of their turnover to a universal service fund. The contract with ARTEL also requires each operator to serve 50 localities, but they find it unprofitable and hard to satisfy this requirement: the investments needed are very high, and many areas do not have an electricity supply.

Cost remains an inhibiting factor. To achieve a teledensity of four per 1,000 by 2013, which requires installation of 46,336 lines, an investment of US\$73.9 million is needed over 10 years. The contribution from the universal service fund would be US\$1.14 million. For a teledensity of five per 1,000, the investment needed would be US\$87.5 million. In this context, there are some NGO initiatives worth mentioning.

The CSDPTT experiment

CSDPTT (Cooperation, Solidarity, Development Posts and Telecommunications) is a non-governmental organisation that has set up telecentres in six villages. Its experience shows that there can be a profitable demand, and ONATEL is starting to look at the initiative seriously.

The initiative consists of installing a public call-box run on solar energy. The equipment is brought by members of the NGO, who are specialists and workers from France Telecom. The average distance between the village and the nearest ONATEL line being 15 km, ONATEL donates a wireless line, which is then operated by a host organisation in the village. ONATEL maintains the equipment and someone in the village is trained for daily tasks. Supervised by the Sodeptel association, CSDPTT sends over the equipment which is installed by local technicians. The initiative started with second-hand equipment brought over from France but the NGO is now considering using new equipment. Calls from these telecentres are cheaper than from mobiles (US\$0.46 per minute, as compared with mobiles' US\$0.65). Internet connection was successfully introduced in February 2004.

Rural telephony

There is no doubt that rural telephony can help solve many problems related to distance – transporting the sick, public health information, bush fire alerts, etc. But inter-village communication is rare: many villagers, it seems, prefer to travel 5–15 km in order to communicate. “The telephone doesn't seem to be a tool for internal communication. People use it for calling the capital or outside the country,” says activist André Nyamba.

One of the reasons given for their lack of popularity is that mobile phones are primarily designed for urban users: they are fragile and small in size (getting smaller), which makes them unsuitable for the rigours of a rural environment. Besides, they come with many features and functions that are of little use because the operators do not provide those particular services.

Nevertheless, the CSDPTT experiment shows that a basic telecoms service can be profitable in rural areas if the operator has certain concessions for users, such as longer periods for payment of bills – whereas ONATEL has set the same conditions for both rural and urban subscribers. For example, ONATEL requires all payments to be made every 15 days, but keeps call charges for rural areas higher than in urban centres.

A strategy for achieving universal service must take such factors into consideration.

Another difficulty is the rapid growth of technologies, which means equipment can quickly become obsolete. Operators either do not want to invest in technologies or, if they do, attempts to recoup investments often mean high tariffs.

Zambia: serious about rural phones?

Yese Williams Bwalya

CS4

Once-prosperous Zambia has suffered economic decline over the past 10 years due in part to low world prices for copper, which makes up 80 per cent of its export earnings. GNP per capita is US\$330 (World Bank, 2002). The population of 10.6 million is one of the most urbanised in sub-Saharan Africa, with 39.8 per cent living in urban areas, mostly in the capital Lusaka and the Copperbelt.

Over the past decade, the telecommunications sector has undergone dramatic changes, beginning with the establishment of a regulatory body, the Communications Authority of Zambia (CA), in 1994. Two private operators are already operating GSM communications and a third – government-owned – is about to launch. The total number of subscribers from the two operators is estimated to be around 220,000 and rising. A number of small businesses selling airtime have also sprung up, and at every street corner there is now a makeshift telephone booth. It's not unusual any longer to see a high school student or market trader carrying a mobile phone.

Indeed, in a country where resources and opportunities are scarce, staying in touch through mobiles seems to be a high priority.

In contrast to these positive developments, the number of fixed lines has increased very slowly, from 77,000 in 1995 to about 85,000 in 2002. Teledensity for fixed lines has actually declined, with overall teledensity growth entirely attributable to mobiles. In four major cities, teledensity reaches 2.01 per 100 people, whereas in rural areas it is estimated at nine per 10,000 people.

The GSM network has expanded to nearly all provinces, but access is hampered by distance and cost. (Data are not available for the proportions of urban and rural mobile subscribers.) Many parts of the country are excluded from the modern infrastructure of roads and electricity, which mainly follow rail lines. Less than two per cent of rural homes receive electricity. However, 30 per cent of the country's 650 pay phones and 450 smart card-based phones are situated away from rail lines.

The government's stated goal is to increase teledensity from the present level of 0.91 lines to two lines per 100 people. This requires the installation of 131,000 new lines. The government hopes to achieve this by digitisation of the transmission network, conversion of earth satellite stations to digital technology, as well as by further spread of GSM services.

However, at present Zambia has no effective rural telecommunication policy in place, although the CA's mandate is supposed to include providing basic services to unserved or underserved segments of the Zambian population, including those in rural areas and economically depressed urban areas. The CA has set up a Telecommunications Development Fund, financed by licence fees. However, the income from licences is not substantial, and some observers feel that most of it is spent on the CA's own operating costs – though information about spending is not publicly available. The CA has undertaken a study to determine telecentre requirements in rural areas, and is currently working out the modalities to fund telecentres. One option is to provide seed capital to rural-based community telecentres at low interest rates.

The country is now in the process of formulating an ICT policy and a policy formulation committee has already produced a draft, with significant stakeholder involvement. Despite a sluggish start marred by anxiety and suspicion over the secrecy and exclusiveness of the process, the process has gained momentum and acceptance by the stakeholders. In its present draft form, the commitment and targets for rural telephony show that the sector is being taken seriously.

The state-run Zambia Telecommunication Company (ZAMTEL), established in 1994, continues to enjoy a monopoly over fixed-line telephone services. The company also has a monopoly of the local loop and recently launched a GSM service – highly contested by the two existing commercial operators who say the service has unfair advantages due to ZAMTEL's control of the fixed network. The international gateway for transmission and receiving of telephone calls, including VoIP telephony for commercial purposes, is also restricted to ZAMTEL.

The quality of services for fixed lines, however, remains unsatisfactory. Among the general complaints are the long waiting time for new connections (official figures were not made available to this researcher), wrong billing and poor quality of connections. ZAMTEL experiences serious financial difficulties – partly because a third of its customers are the government and parastatals who are not prompt with paying their bills. The company is entitled to government grants, but these have not been forthcoming, mainly due to the government's budgetary limitations. Rampant vandalism of the telecommunication infrastructure also continues to cost ZAMTEL millions of dollars.

ZAMTEL's current expansion plans are focused on its entry as Zambia's third cellphone operator. A sum of about US\$18 million has been allocated for network build-up, financed entirely by the equipment supplier. Very little financing is available for fixed network upgrading and for expansion of the basic infrastructure network in outlying areas.

The two existing mobile operators are CelTel and TeleCel Zambia. CelTel is a subsidiary of MSI International, while TeleCel Zambia, owned 30 per cent locally, is a subsidiary of TeleCel International Ltd, a US-based cellular telecommunications group. The third mobile company about to launch is ZAMTEL's new GSM, Cell Z. The two private operators have good coverage in the towns along the line of rail, but subscribers complain about poor quality of service. There is little sharing of capacity, and both networks have their own infrastructure, including international satellite connections. Relations with ZAMTEL are not very good mainly because of pricing issues; access to the fixed network; and ZAMTEL's new GSM operation, which they argue gives it undue advantage.

There is no entry restriction into the Zambian telecommunications market apart from the basic licensing requirements. The CA is responsible for regulating tariffs although operators are free to fix their own local call rates. There are no government subsidies for private operators but under special circumstances, the CA is empowered to offer special incentives to operators. Under the present regulations, operators are free to repatriate 100 per cent of their profits.

Over 90 per cent of mobile phone users are using cash cards. Tariffs are very high, considering average incomes in Zambia. Cross-network charges are exorbitant at US\$0.60 per minute. All operators now provide SMS (Short Message Service) services, and all offer toll-free numbers for emergencies. TeleCel has also introduced a public toll-free number for HIV/AIDS counselling.



Businessman on his mobile phone in supermarket, Malawi. While urban users have benefited from mobile phones, the challenge of rural coverage is often left unaddressed.

MIKKEL OSTERGAARD/PANOS PICTURES

Conclusion

Six years after the WTO's Basic Telecommunication Services Agreement, a new competitive telephone environment is greatly improving services for urban people, but rural areas are generally being neglected. It appears that competition and the market alone are not sufficient to deliver service provision in rural areas, where the population is thinly spread and the level of potential profit is perceived to be low. Competition and technological developments are bringing universal access within reach, but there remain many challenges to providing rural services effectively within a predominantly market-oriented telecommunications environment.

Most governments in Africa are committed in principle to universal access, as they see the development benefits it could bring. However, they are not taking the steps needed to achieve it. Policy issues that should be widely debated include:

- Competition policy and regulatory environments, and the continuing protected status of many former state-owned providers;
- The need for subsidising the rural sector, and how mechanisms such as Rural Service Funds can be made effective and transparent;
- Technologies for providing rural service – are fixed-lines becoming obsolete, being replaced by more flexible and cost-effective new technologies, or are fixed lines still most appropriate for rural areas?
- The links between telecommunications and other basic infrastructure such as roads, electricity and postal services, whose absence undermines the viability and value of rural telephony.

Rural telephony risks slipping off the global policy agenda. The recent pan-Africa charter NEPAD (New Partnership for Africa's Development) and the WSIS declaration both fail to address specifically the need for rural communications structures as a development tool, despite recognising the need to close the digital divide. But as long as the rural poor and marginalised are left out of the ICT debate, and as long as the debate itself ignores the need for rural telephones and other essential communications infrastructure in Africa's development, the communications revolution will remain incomplete.

Appendix: Africa ICT profile

Most African capitals now have more than one Internet Service Provider (ISP), and seven countries – Egypt, Kenya, Morocco, Nigeria, South Africa, Tanzania and Togo – had 10 or more by 2002. In mid-2002 there were about 560 public ISPs across the region (excluding South Africa, where the market has consolidated into three major players with 90 per cent of the market and about 75 small players with the remainder). Ethiopia and Mauritius are the only countries where a monopoly ISP is still national policy, but in practice a monopoly still continues in some others, predominantly in the Francophone and Sahelian sub-regions, where markets are small. AfricaOnline is the largest multinational ISP in the continent.

ISP subscription charges vary greatly, reflecting the different levels of maturity of the markets; the varying tariff policies of telecom operators; and different regulations on private wireless data services and access to international telecommunications bandwidth. According to the Organization for Economic Cooperation and Development, 20 hours of internet access a month, including telephone charges, cost \$22 in the US in 2000. European costs were higher (US\$33 in Germany; US\$39 across the EU). In Africa the average total cost of using a local dialup internet account for 20 hours a month is about US\$60 a month (usage fees and local call telephone time included, but not telephone line rental) – which is higher than the average African salary. Internet access in Africa is a luxury that only a fraction of the population can afford.

There are now about 39 countries in Africa with 1,000 or more dialup subscribers, 20 countries with more than 5,000. Not surprisingly, southern and northern Africa, which have more developed economies, better infrastructures and which were among the first in the continent to obtain internet access, have larger populations of internet users.

Advanced services such as ISDN and video conferencing have generally not been available, but countries that have recently added ISDN services include Botswana, Cote d'Ivoire, Egypt, Kenya, Ghana, Mauritius, Morocco, the Seychelles, Sudan, Togo, Tunisia, South Africa and Uganda. However, since they mostly do not have ISPs capable of providing ISDN connections, there were only about 40,000 ISDN subscribers across the continent in 2000, half of whom were in South Africa.

Few comparative studies have been made in Africa of the number of rural and urban users, but it is safe to say that users in the cities and towns vastly outnumber those in rural areas. However many countries now have points of presence (POPs) in some secondary towns, bringing the number of centres with local infrastructure across Africa to about 240, 50 of them in South Africa. Nineteen countries have introduced local call charges for all calls to the internet regardless of distance, which greatly reduces costs for people living in remote areas: Benin, Burkina Faso, Cape Verde, Ethiopia, Gabon, Malawi, Mali, Mauritius, Mauritania, Morocco, Namibia, Niger, Senegal, South Africa, Chad, Togo, Tunisia, Uganda and Zimbabwe. Seychelles goes a step further to encourage use, charging calls to the internet at 50 per cent less than normal local voice calls.

Glossary

Analogue phones

A sophisticated radio boosted by transmitters that allows the user to talk and listen at the same time.

Broadband

A transmission facility having a bandwidth sufficient to carry multiple voice, video or data channels simultaneously.

Convergence

The situation in which several audio, data and image services can be transformed into bytes and transmitted. Examples: internet audio/video broadcasting and mobile texts.

Fixed-line network(s)

Traditional wired telephones.

GSM

Global System for Mobile Communications. A pan-European standard for digital cellular communications being adopted by over 60 countries.

International roaming arrangements

An arrangement between GSM mobile operators around the world to use a GSM-based mobile in country/ies other than where it is subscribed.

Internet Exchange Points

A public network exchange facility where ISPs can connect with one another in peering arrangements.

Internet Service Provider (ISP)

A company that provides access to the internet.

Ku-Band satellite

Satellite transmissions are carried on one of two frequencies: C-band or Ku-band. When operating at the higher frequency Ku-band, the strength of the satellite signal may be temporarily weakened under severe rain conditions. C-band is immune to adverse weather conditions.

Teledensity

Number of telephones per 100 inhabitants.

Voice over Internet Protocol (VoIP) telephony

A category of hardware and software that enables people to use the internet as the transmission medium for telephone calls.

Wireless Area Network (WLAN)

A type of local area network that uses high frequency radio waves rather than wires to communicate and transmit data. It is a flexible data communication system implemented as an extension to, or as an alternative for, a wired local area network within a building or community.

Wireless Loop (WLL)

A system that connects subscribers to public fixed line networks using radio signals as a substitute for copper wires for all or part of the connection between the subscriber and the switch.

Useful contacts

International Organisations

Commonwealth Telecommunications Organisation (CTO)

Clareville House
26–27 Oxendon Street
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Tel: +44 20 7930 5511
Fax: +44 20 7930 4248
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Department for International Development, ICT strategies

1 Palace Street
London SW1E 5HE
United Kingdom

Tel: +44 20 7023 0000
Fax: +44 20 7023 0019
Web: www.dfid.gov.uk

International Telecommunications Union (ITU)

Place des Nations
CH-1211 Geneva 20
Switzerland

Tel: +41 22 730 51 11
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Web: www.itu.int

Millennium Development Goals

Web: www.developmentgoals.org

The World Bank

1818 H Street, NW
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USA

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World Trade Organization (WTO)

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African Information Society Initiative

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NEPAD (New Partnership for Africa's Development)

NEPAD Secretariat
PO Box 1234
Halfway House, Midrand, 1685
South Africa
Web: www.nepad.org

Regional African Satellites Communications Organisation (RASCUM)

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Senegal

Web:
www.gouv.sn/ministeres/minfo/contacts.cfm

Uganda Communications Commission (UCC)

PO Box 7376
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Email: ucc@ucc.co.ug
Web: www.ucc.co.ug

Zambia Telecommunications Co Ltd (ZAMTEL)

Tel: +260 2 611111
Web: www.zamtel.zm

Non-governmental organisations

allAfrica.com

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USA

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The Association for Progressive Communications

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Boy walking along road, Ethiopia.
Basic infrastructure such as roads,
electricity and postal services
complements telecommunications
in the overall communications
environment.

SEAN SPRAGUE/PANOS PICTURES

In the midst of the current enthusiasm for 'ICTs for development', it is often forgotten that most rural Africans do not yet even have access to telephones. Initiatives such as the World Summit on the Information Society aspire to bridge the digital divide in order to reduce poverty and achieve the Millennium Development Goals, but this aim risks being undermined if basic telephone connectivity is not first made available.

In most of rural Africa, there is only one telephone for every thousand people. It is true that the number of phones in Africa has risen enormously in the past decade, especially since liberalisation, but most of the new telephones are mobiles, and they are mostly in cities. For rural people, buying and using a mobile phone is very expensive – a single call can cost as much as half the daily wage of an agricultural worker.

Will mobile services become cheap enough to meet rural needs? Are satellite and other new technologies making traditional fixed-line infrastructures obsolete? Will the level of rural phone use ever be enough to provide a profitable market for private providers, or will substantial subsidy be needed to ensure rural services? These and other questions should be much more widely debated.

At present, the lack of rural connections is often hidden behind impressive overall figures for the growth of telephony. Important development Initiatives such as NEPAD and the World Summit on the Information Society focus on internet-based ICTs, and where they mention telephony at all it is in general terms. This report, based on case studies from Burkina Faso, Senegal, Uganda and Zambia, argues that policy-makers should pay more attention to the challenge of providing telephones to rural people in Africa. If they do not, the development benefits of the information revolution will by-pass many of the world's poorest people.

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