

## **Network Connectivity in Africa – The Current Status**

**Mike Jensen**

*Independent Consultant/IDRC Knowledge Analyst, South Africa*

[mikej@wind.sn.apc.org](mailto:mikej@wind.sn.apc.org)

The new millenium is now beginning to see significant advances in Africa's quest for greater connectivity. Five years ago, only a handful of countries had local Internet access, now it is available in every capital city on the continent. In the same period more mobile cell phones were deployed on the continent than the number of fixed lines laid in the last century. Hundreds of new radio stations have also emerged, and satellite TV is now widely available.

Nevertheless, while a substantial increase in the rate of expansion and modernisation of fixed networks is taking place, along with the explosion of mobile networks, the overall fixed line teledensity as is still only about one per 130 inhabitants in Sub-saharan Africa (excluding South Africa), and taking into account population growth, the effective annual increase in lines is only 6%.

Also, most of the existing telecom infrastructure cannot reach the bulk of the population - 50 percent of the available lines are concentrated in the capital cities, where only about 10 percent of the population live. In over 15 countries in Africa, including Cote d'Ivoire, Ghana and Uganda, over 70 percent of the fixed lines are still located in the largest city<sup>1</sup>.

The situation is not quite as bad as it would appear however, because of the penetration of mobile networks, where subscribers have now surpassed fixed line users in most countries, underlining the pent-up demand for basic voice services. Because of the low cost and long range of the cellular base stations, many rural areas have also been covered. But the high cost of mobile usage (about US50c/minute on average) makes it too expensive for regular local calls or Internet access.

Overall, the number of fixed lines increased from 12.5 million to 21million across Africa between 1995 and 2001. North Africa had 11.4 million of these and South Africa had another 5 million lines, leaving only 4.6 million for rest of the continent. The sub-Sahara thus contains about 10 percent of the world's population (626 million), but only 0.2 percent of the world's 1 billion telephone lines. Comparing this to all of the low-income countries, (which house 50 percent of the world's population and 10 percent of the telephone lines), the penetration of phone lines on the sub-continent is about 5 times worse than the 'average' low income country.

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<sup>1</sup>ITU World Telecommunication Development Report 2002

While the telecom infrastructure is beginning to spread, domestic use has until recently been largely confined to the small proportion of the population that actually afford their own telephone - the cost of renting a connection averages almost 20 percent of GDP per capita, vs. a world average of 9 percent and only 1 percent in high income countries.<sup>2</sup> However there has been a substantial increase in public phone shops and telecentres in many countries, with the most well known success in Senegal which now has over 10 000 commercially run public phone bureaus, employing over 15 000 people and generating over 30% of the entire network's revenues. While most of these are in urban areas, a growing number are being established in more remote locations and some are now also serving needs for providing Internet access and other more advanced ICT services to the public.

The high costs of connectivity in remote areas will also be addressed by the large number of low-cost two-way Ku-band VSAT satellite-based data services that have recently been launched. These services will be a major boon to rural users, making use of the new high-powered satellite footprints now covering Africa, similar to services currently available in the United States and Europe. Costs are about USD 1500–3000 for the VSAT equipment and USD 200–400 per month for “better than dialup” speeds (i.e. 56 Kbps outgoing and 200–400 Kbps incoming). These are expected to see rapid uptake wherever regulations allow, unfortunately, most countries in Africa either charge excessively high license fees or do not allow these services at all, as they compete with the state run telecom operator.

As the graph in the slides shown at the round table (available at [www.ejd.org/meeting2003](http://www.ejd.org/meeting2003)), both the number of Internet users and the amount of international bandwidth is still growing strongly across the continent. Although substantial numbers of cybercafes have emerged in most countries over the last few years, the Internet has so far had the greatest impact at the top end of business and in wealthy families, primarily in the major urban areas. Because of the large number of shared accounts, bolstered by the growing use of public access services it has become difficult to measure the total number of Internet users in Africa. While the number of dialup subscriber accounts is readily available, these figures are only a partial gauge of the size of the Internet sector. As shown in the accompanying charts, other indicators such as the quantity of international traffic help to flesh out the full picture.

The rates of consumer growth seen in the 1990s have slowed in most countries because the bulk of the users who can afford a computer and telephone have already obtained connections. As of mid-2002, the number of dialup Internet subscribers was close to 1.7

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<sup>2</sup>It should be noted that there is a large variation between countries in the charges for installation, line rental and call tariffs. The average business connection in Africa costs over \$100 to install, \$6 a month to rent and \$0.11 per 3 minute local call. But installation charges are above \$200 in some countries (Egypt, Benin, Mauritania, Niger and Togo), line rentals range from \$0.8 to \$20 a month, and call charges varied by a factor of 10 - from \$0.60 an hour to over \$5 an hour.

million, only 20% up from 2001. Of these subscribers, North Africa and South Africa are responsible for about 1.2 million, leaving about 500,000 for the remaining 49 sub-Saharan African countries. If we assume that each computer with an Internet or email connection supports a range of three to five users, this puts current estimates of the number of African Internet users at about 5 to 8 million. About 1.5–2.5 million of the users are outside North and South Africa, or about 1 user for every 250 to 400 people. This compares with a world average of about 1 user for every 15 people, and a North American and European average of about 1 user in every 2 people.

However public access and the use of corporate networks is continuing to grow at greater rates than the number of dialup users. This can be seen in the use of international Internet bandwidth, which is still expanding substantially — in 2001 it was up over 100%, from 700 Mbps of available outgoing bandwidth to 1500 Mbps in 2002. However, this is still slower growth than the rest of the world, which averaged 174% in 2001. No studies have been made in Africa of the number of rural versus urban users, but it is safe to say that users in the cities and towns vastly outnumber rural users.

Although many African countries now have points of presence (POPs) in some of the secondary towns, (about 300 different locations across the continent), this still means that most rural users have to make a costly long distance call to connect to the Internet. However some countries have now instituted local call charges for all calls to the Internet regardless of distance, which greatly reduces costs for those in remote areas and greatly increases accessibility and the viability of Internet services provided by rural cybercafes in these nations. So far, 19 countries have adopted this strategy — Benin, Burkina Faso, Cape Verde, Chad, Ethiopia, Gabon, Malawi, Mali, Mauritius, Mauritania, Morocco, Namibia, Niger, Senegal, South Africa, Togo, Tunisia, Uganda, and Zimbabwe. Interestingly, the Seychelles has gone a step further to encourage use, and tariffs for calls to the Internet are charged at a 50% lower rate than normal local voice calls.

Currently, the average total cost of using a local dialup Internet account for 20 hours a month in Africa is about USD 60 per month (usage fees and local call telephone time included, but not telephone line rental). ISP subscription charges vary greatly (between USD 10 and USD 80 a month) and largely reflect the different levels of maturity of the markets, the varying tariff policies of the telecom operators, the different regulations on private wireless data services and on access to international telecommunications bandwidth.

In the area of Internet-based content and applications, the African web-space continues to expand, albeit at a rather slow rate, and there are still rather too few relevant applications for the average African user. Almost all countries now have some form of local or internationally hosted web server, unofficially or officially representing the country with varying degrees of comprehensiveness.

Although there are a few notable official general government web sites, such as those of

Angola, Egypt, Gabon, Lesotho, Mauritius, Morocco, Mozambique, Senegal, South Africa, Togo, Tunisia, and Zambia, there is as yet little discernible government use of the Internet for existing administrative purposes. Web presence is higher in some sectors, particularly those involved in tourism and foreign investment, and these often have more mature sites that are aimed at developing an international market presence, however these are of little interest for most potential users.

Outside South Africa, there are generally few organizations that are using the web to deliver significant quantities of information or to carry out transactions with their user-base. Although large numbers of organizations now have a “brochure” website with basic descriptive and contact information, very few actually use the Internet for real business activities. This is mainly explained by the limited number of local people that have access to the Internet (and thus the limited importance of a web presence to the institution), the lack of credit cards and the high costs of local web-hosting services.

One of the early and still amongst the most important impacts of increased connectivity has been the use of email to reduce the cost, and increase the speed and duration of international communications. This has allowed many people and organisations to improve management, obtain resources and generally achieve much better communications with their family, friends, colleagues and partners around the world or in neighbouring countries. The penetration of mobile phones has had a similar effect on national communications.

Although the relatively low level of ICT penetration amongst the public in Africa has so far limited the use of ICTs for governance purposes, many administrations are beginning to streamline their operations and improve internal efficiencies by adopting ICTs within the organisation. For example, the Government of Lesotho recently declared that all announcements for cabinet and committee meetings would be made only by email. Some administrations such as those in South Africa, Algeria and Tunisia now provide immediate global access to tenders via the web. Health and education departments in many countries are beginning to electronically transmit operational statistics such as disease occurrences and pupil registrations. In South Africa, the results of blood tests are being transmitted to remote clinics that are off the telecom grid via mobile telephone text messages. As greater numbers of public officials are now gaining low-cost access to the web, the vast information resources available via Internet are becoming increasingly important tools in ensuring informed decision-making.

The scalability of ICTs lend themselves to adoption by small and medium size enterprises which can provide much needed local communication services. Furthermore the 'death of distance' provided by the Internet has meant that there are even greater opportunities to be found in exploiting the much larger information and communication-based economies of the more developed countries. Some examples of these include: A local Internet service provider in Morocco has a contract to digitise the National Library of France's paper archives. They are scanned in France, sent over by satellite link where they are edited by keyboard operators in Rabat.

In Togo, South Africa and Mauritius call centres now provide telephone support services for international companies with customers in Europe and North America. Callers don't realise they're calling Africa, they pick up the phone, dial a local number and are routed through to one of these countries where the operators there provide the support that they require.

In Cap Verde 'virtual security guards' have found jobs using the Internet to monitor webcams in office parks on the east coast of the US. They notify local rapid response teams there if they see anything amiss.

Many African craft makers are selling their wares in the world wide web, supported by NGOs such as PeopleLink.

While these developments are encouraging, unfortunately there are rather too few of these examples, largely because of the low level of penetration of the infrastructure and supporting environment necessary to effectively use ICTs in Africa.

The African news media are now relatively well represented on the web - over 150 different newspapers and news magazines that are available on the Internet. Those most well represented in this area are again those with more advanced Internet sectors — Côte d'Ivoire, Egypt, Ghana, Kenya, Nigeria, Senegal, South Africa, Tanzania, Zambia, and Zimbabwe.

Universal smart card and e-commerce policies are also gaining attention in a number of countries. Mauritius and South Africa are looking at a single smart card that will allow the public to hold their drivers licence, small amounts of funds that can be used for small transactions, and their health and other social security information. Harmonization of e-commerce policies is also on the agenda in a number of countries, so that, for example, electronic evidence is upheld in court and can be used for ensuring that e-commerce is correctly carried out.

Efforts to promote more universal access to ICTs in Africa have been discussed among high-level policymakers since the early 1990s and official recognition was given to the issue in 1996 when the Conference of African Ministers of Social and Economic Planning requested the UN Economic Commission for Africa to set up a "high-level working group" to chart Africa's path onto the global information highways. An expert group developed a framework document entitled the African Information Society Initiative (AISI), which was adopted by all of Africa's planning ministers the following year.

AISI called for the formulation and development of a national information and communication infrastructure (NICI) plan that would be driven by national development priorities in every African country. AISI also proposed cooperation among African countries to share experiences.

Most countries have begun the process for developing NICI plans, and 17 countries have

already finalized their strategies — Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Egypt, Gambia, Mauritania, Mauritius, Morocco, Mozambique, Rwanda, Senegal, Seychelles, South Africa, Sudan, and Tunisia.<sup>3</sup> High in the area of priorities in many of these plans is improvement of access to ICTs in rural areas through the use of Telecentres that exploit the convergence of technologies to provide cost-effective services in under-serviced and remote locations.

The impact of much of these efforts will depend largely on the extent of improvements to the telecommunication infrastructure on which use of ICTs depends. Liberalisation of the telecommunication sector and the introduction of competition is seen as a key to driving down prices and increasing the quality of service.

Many of the systemic issues are being addressed by the African Union and their programme, the New Partnership for African Development (NEPAD), supported by the international community. This many-faceted effort is aimed at accelerating Africa's development and should as a result help to create an environment more conducive to the rapid adoption of ICTs.

While there are a variety of efforts underway to restructure national telecom operations and build better national and international infrastructure, many of these lack a cohesive approach built on a clear understanding of the dynamics and impact of the blindingly fast changing communications technologies. Models of infrastructure provision are likely to be quite different to those employed in developed countries because of the generally low income levels, limited formal business activity and the much greater importance of the rural population, where up to 80% of the people may live outside urban areas. In addressing the low income factor, innovative models may be necessary which focus on shared infrastructure, public access facilities and the use of intermediaries to interact with the public who may not have functional literacy, let alone be computer literate.

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