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Africa

The countdown to 2015

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International
Telecommunication
Union

Investing in Africa's Future

Connect Africa Summit
Kigali, Rwanda
29–30 October 2007

CONNECT
Africa
The countdown to 2015

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MESSAGE
FROM THE UNITED NATIONS SECRETARY-GENERAL

His Excellency Ban Ki-moon

Secretary-General of the United Nations

UN/Mark Garten

Message to the Connect Africa Summit

It is a great pleasure to send my greetings to the *Connect Africa* Summit. On behalf of the United Nations family, I express my appreciation to President Kagame and the Government of Rwanda for hosting the summit at this strategic time.

I commend Dr Hamadoun Touré, Secretary-General of the International Telecommunication Union, for his leadership. Thanks also go to Dr Craig Barrett of the Intel Corporation and Chairman of the United Nations Global Alliance for ICT and Development, for mobilizing the private sector, and to the World Bank for its commitment to connecting Africa.

This meeting illustrates the power and potential of public-private partnerships. It joins together the African Union, the African Development Bank, the UN Economic Commission for Africa, African governments and the private sector to address the barriers to connectivity in the region.

The partnership augurs well for the hopes and aspirations of all of the people of Africa in a better future. The World Summit on the Information Society set a clear course of action for advancing the information society and for achieving the Millennium Development Goals – our common vision to build a better world for all in the 21st century.

Narrowing the digital divide is part and parcel of our global efforts to achieve development for all. Information and communication technologies have much to contribute to the fight against poverty, disease, hunger, illiteracy and environmental degradation.

They can empower women and poor people in underserved communities.

They enable young people everywhere to more effectively act as catalysts for change – locally and globally.

And they can accelerate progress towards our development goals by improving the efficiency and accountability of governments, facilitating the delivery of health services, nurturing and disseminating knowledge and education, and creating business opportunities for entrepreneurs.

These benefits must be made available to all segments of society, in urban and rural areas, and in all regions, especially in Africa, the one region not on track to meet the Millennium Development Goals by 2015. That is why we must redouble our efforts and form a true partnership for development. The goals can still be achieved if we all work together – governments of rich and poor countries alike,

World Bank

civil society, the private sector, and the international development community.

To help fill the implementation gaps in Africa, I recently convened the Millennium Development Goals Africa Steering Group, bringing together leaders of major multilateral and intergovernmental development organizations. The group is focusing on three major challenges: identifying effective mechanisms for implementing commitments in the areas of health, education, agriculture and food security, infrastructure, and statistical systems; improving aid predictability and effectiveness; and strengthening our joint efforts at the country level.

Information and communication technologies can be key enablers for meeting each of these challenges. I am encouraged by your determination to act, as evidenced by your engagement in this summit, with its focus on implementation.

Together, let us harness the power of information and communications technologies to advance our shared objective of ending the scourge of poverty once and for all, in Africa and around the world.

I wish you every success at this forum, and I look forward to learning about its outcome.

The ten WSIS* targets to be achieved by 2015

Connect villages and establish community access points

Connect universities, colleges, secondary schools and primary schools

Connect scientific and research institutions

Connect all public libraries, archives, museums, cultural centres and post offices

Connect health centres and hospitals

Connect all local and central government departments and establish websites and e-mail addresses for them

Adapt all primary and secondary school curricula to meet the challenges of the information society, taking into account national circumstances

Ensure that the entire world population has access to television and radio services

Encourage the development of content and put in place technical conditions in order to facilitate the presence, and use, of all world languages on the Internet

Ensure that more than half the world's inhabitants have personal use of ICT.

*World Summit on the Information Society

PREFACE

His Excellency Paul Kagame
President of Rwanda

Government of Rwanda

Rwanda welcomes the world

We are honoured in Rwanda to co-host the *Connect Africa* Summit with the International Telecommunication Union. Gathering in Kigali for this meeting will be key partners in African development, including African governments, the African Union, the African Development Bank, the World Bank Group, and the United Nations Global Alliance for ICT and Development, as well as leading corporations.

It is clear that Africa has fallen behind in making use of science and technology, including information and communication technologies (ICT), to spur development and create prosperity. Our cities remain unconnected – to say nothing of rural Africa. Plans to link our continent with the rest of the world remain largely unrealized. Requisite policies and standards, as well as regulatory frameworks, have yet to be fully developed and harmonized. In addition, human capacities to drive ICT as a tool for development remain meagre.

The *Connect Africa* Summit signals a departure from this current bleak reality. We will be presented with an unprecedented opportunity to seriously commit our countries and continent to a focused road map that will lay the foundation for taking advantage of ICT to spark economic growth, employment and development.

At the end of this conference, we must equip ourselves with a strategy to address each of the noted shortcomings. Most importantly, we must have a clear plan to ensure that we act quickly to achieve the goals that we set. Rwanda is fully committed to playing its role in this endeavour.

I look forward to welcoming to Rwanda all distinguished government and private-sector leaders, development finance institutions, regional communities, academia and civil society organizations. Together, we will forge at this Kigali meeting, a solid partnership for realizing Africa's vision of improving the lives of our people through the power of ICT.

FOREWORD

Dr Hamadoun I. Touré

Secretary-General of the International Telecommunication Union (ITU)

ITU/J.M. Ferré

ITU's mission to connect people everywhere

It is my great pleasure to launch this inaugural edition of *Connect Africa*, a new publication to track progress in investment and the development of information and communication infrastructure on the African continent. Projects that help close the digital divide are a sound business model, attractive to industry. It is with this in mind that world leaders and the highly regarded experts writing in this edition share their views on what can be done to connect Africa more rapidly.

WSIS targets and the Millennium Development Goals
The need to promote access to information and communication technologies (ICT) has been widely recognized, especially as a result of the World Summit on the Information Society (WSIS), held in Geneva in 2003 and Tunis in 2005. We are only eight years away from the 2015 deadline for achieving the WSIS targets of connecting all villages, towns and cities of the world, as well as the United Nations Millennium Development Goals (MDGs), which ITU Member States also embraced. These goals require countries to do more to eradicate extreme poverty and hunger; ensure that children everywhere finish primary school; promote gender equality and empower women; reduce child mortality; improve maternal health; combat disease; ensure environmental sustainability, and develop a global partnership for development.

ITU has an important role to play in tracking progress in the use of ICT to achieve the MDGs, as well as the WSIS targets.

Time is short. We must have a more focused approach in order to meet the challenge. This is why ITU launched its *Connect the World* initiative in 2005. It is also why we launched the *Connect Africa* initiative in July this year to take a regional approach to bridging the digital divide. As the specialized agency of the United Nations for ICT, we carry the torch to help connect people in every corner of the world so that they can all benefit from the ongoing digital revolution. ITU has 191 Member States and over 700 Sector Members and Associates from both the private and public sectors, including international and regional telecommunication organizations. We are, therefore, uniquely placed to achieve this mission.

The *Connect Africa* Summit
We will start with Africa because of its huge potential. Investment in the continent's ICT infrastructure has improved dramatically in recent years, and there is an increasingly vibrant environment for the private sector. This is especially true for mobile telephony, which has been stimulated by competition and policy and regulatory reform in most African telecommunication markets. Nevertheless, ICT

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markets are still very much underserved. To help solve this, a *Connect Africa* Summit will take place in Kigali, Rwanda, on 29–30 October 2007. It will be the first in a series of regional initiatives to help achieve the connectivity goals of WSIS across the world, and will be held under the patronage of President Paul Kagame of Rwanda and President John Kufour of Ghana, who is also the current Chairman of the African Union.

The Kigali Summit is organized by ITU, the African Union, the World Bank Group, and the United Nations Global Alliance for ICT and Development (GAID), in partnership with the African Development Bank, the African Telecommunications Union and the United Nations Economic Commission for Africa (ECA). This collaborative effort will engage more than 500 high-level representatives of stakeholders that are active in the region, including China, Arab countries, the European Commission, the Organisation for Economic Co-operation and Development (OECD), major ICT companies, the United Nations Development Programme (UNDP) and other international organizations and civil society.

Forging new partnerships
The Connect Africa Summit will have a practical, results-oriented format, including multi-stakeholder panel discussions, partnership announcements, and opportunities for participants to showcase their ICT development projects to potential partners and donors. It will provide an excellent networking platform for leaders from the public, private and financial sectors to meet and forge new partnerships for the future.

The summit will examine key success factors for ICT investment, such as a supportive environment. It will encourage collaboration on initiatives to expand broadband backbone infrastructure and access networks, enhance capacity building, and stimulate locally relevant ICT applications and services. Above all, this will be a pragmatic conference. We will discuss how we can create jobs that will, in turn, create wealth for societies as a whole. It is to be a summit of commitments.

I believe that to achieve our goals in ICT, we need partnerships that will help promote development in Africa, and by which all stakeolders, including investors will make profit. *Connect Africa* will produce a win-win situation, where both developed and developing countries will have something to gain. ■

Dr Craig R. Barrett

Chairman of the Board of Intel Corporation and Chairman of the United Nations Global Alliance for ICT and Development (GAID)*

* Craig R. Barrett was appointed Chairman of the UN GAID in 2006. Before becoming Chairman of Intel Corporation in 2005, he served as the company's CEO for seven years.

Intel

Working in partnership to achieve Africa's potential

The *Connect Africa* Summit offers an unprecedented opportunity to pave the way for Africa's people to join the global economy of the 21st century. Today's world economy holds the same promise for African nations as it does for other countries that have secured their place in it — as China, India and the Russian Federation have recently done. As information and communication technologies (ICT) become the underpinnings of most economic sectors worldwide, experience has shown that investing in ICT infrastructure and affordable Internet connectivity can be a catalyst for sustainable economic growth, employment and social development.

Many stakeholders are working to make this happen throughout Africa. The *Connect Africa* Summit, a first-of-its-kind event hosted by the government of Rwanda, is a direct result of their combined initiatives. I will have the privilege of attending the summit as the Chairman of the UN Global Alliance for ICT and Development (GAID), which is co-organizing the event with ITU, the World Bank, and the African Union, in partnership with the African Development Bank, the African Telecommunications Union and the United Nations Economic Commission for Africa.

ICT conferences have been convened in Africa before, but not with such a high level of cooperation among international bodies, regional organizations and the private sector. This joint effort is highly encouraging. ITU Secretary-General Hamadoun Touré, who has personally spearheaded the *Connect Africa* initiative this year, merits special recognition. Rwanda's President Paul Kagame also deserves acknowledgement for hosting the summit and demonstrating regional leadership with his country's progressive ICT policies.

I believe two key points must emerge from this endeavour to empower the people of Africa through ICT. They relate to the roles that the private sector and government play in investment and infrastructure development.

First, local and global ICT companies need to recognize that Africa offers them tangible business opportunities. The region is growing, as evidenced by consistent GDP growth of 5 per cent a year. Another example of growth is the USD 25 billion of investment in telecommunication networks — primarily mobile phone networks — over the past five years, according to World Bank estimates. This is not to suggest that technology companies abandon their philanthropic and corporate social responsibility efforts, but rather that they consider the growing business oppor-

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tunities available in Africa. Working with local companies to build profitable enterprises that create jobs and tax revenue is often the best way to advance sustainable economic and social development.

Second, evidence from around the world has shown that competition through liberalization and privatization of telecommunication markets drives down prices and encourages innovation. In Africa, this has happened already with regard to mobile telephony. Consequently, the growth of mobile subscribers is on an explosive trajectory – faster than anywhere else.

However, Internet connectivity in Africa lags far behind the rest of the world. It continues to be either largely unavailable or prohibitively expensive, due mainly to limited broadband infrastructure investment. Today, 70 per cent of all continental traffic goes outside Africa, driving up costs for consumers. According to the World Bank, the cost of Internet connectivity in Africa is the highest in the world – the equivalent of USD 250–300 per month. Where high-speed Internet access is available in Africa, the price averages three times higher than in Asia, for example. It is a small wonder that broadband penetration is stalled at less than 1 per cent. Without this critical infrastructure, Africa is at risk of foregoing the

job creation and growth opportunities that the information economy is creating around the world.

I see no reason why the growth of broadband Internet could not follow the success pattern of mobile telephony. With the appropriate enabling policies in place, new businesses will enter the market and begin fuelling employment and economic growth. The need is greatest for telecommunication liberalization, so that competition among carriers and Internet service providers can drive prices down. Equally important, governments should use wisely the natural resource of radio spectrum and allocate sufficient bands to wireless broadband services in a technology-neutral manner. Without the extensive reach of fixed telephone networks, wireless is the best way to roll out broadband services. Many promising wireless technologies, such as WiMAX, can dramatically lower the cost of providing broadband services.

Reliable, affordable access to ICT resources will help ensure that all African citizens have the opportunity to participate in the global economy. Africa's goal should be to replicate its success with mobile phone growth in broadband capability, achieving Internet access in every village, every school, every university and every hospital. ■

PERSPECTIVE
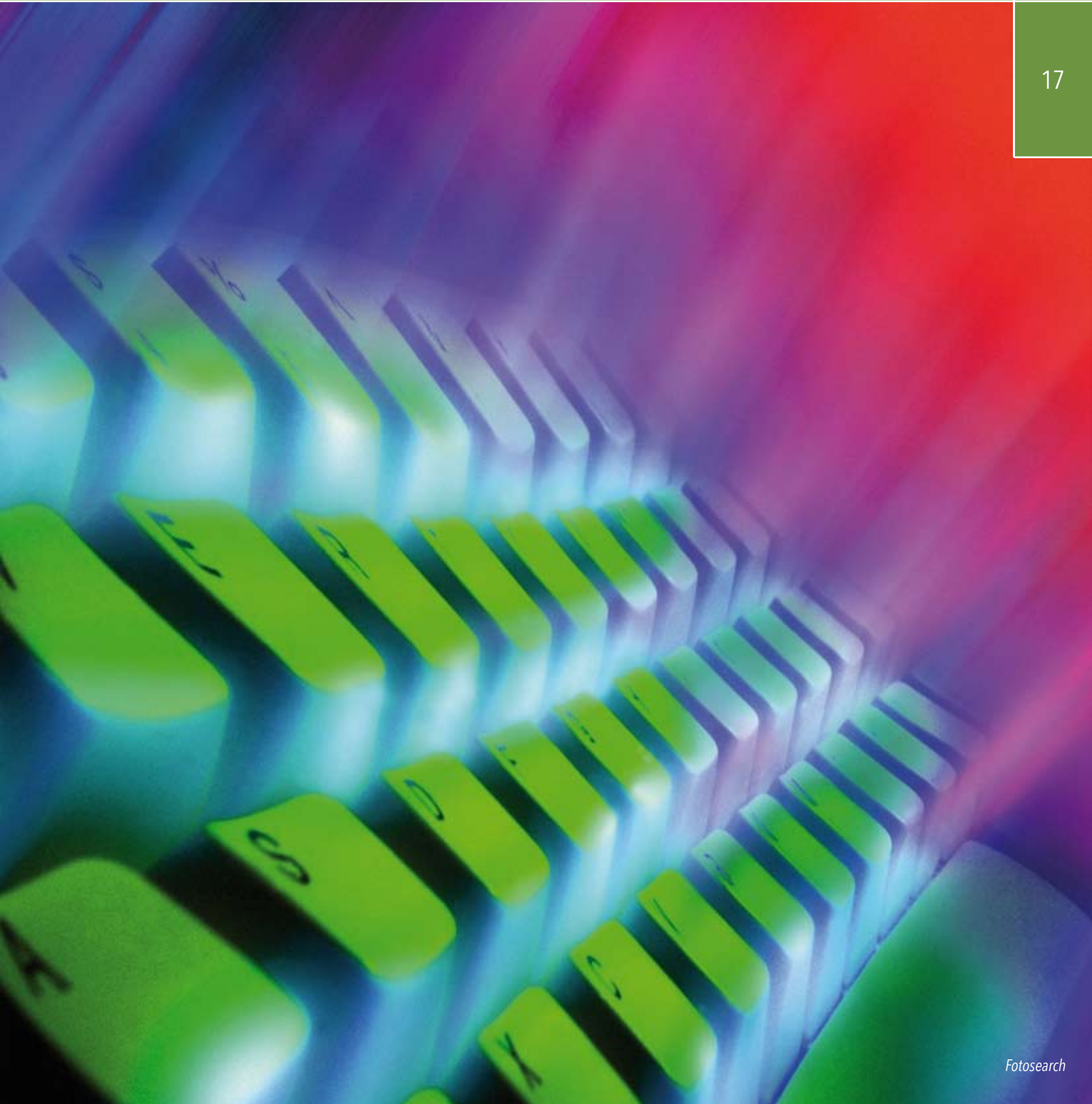
His Exellency John Agyekum Kufuor

President of Ghana and
Chairman of the African Union

Mark Wilson/Ge   mages

Creating a knowledge society

Today, we are all committed to the creation of the knowledge and information society, as information and communication technologies (ICT) are no longer a matter of choice, but a necessity for promoting the creation of access to knowledge in this global society of ours.

We in Africa are poised to actualise the common vision of providing universal access to ICT, so that we can benefit from the strength of sharing our connectivity resources on the continent to achieve our collective developmental objectives, in particular the Millennium Development Goals.

The challenges that confront Africa require the combined effort of our governments, development partners, friends of Africa, ICT industry players, the private business community, civil society and so on, to mobilize adequate resources to develop the needed ICT infrastructure to support the innovative and creative spirit of our people, propel economic progress and improve the well-being of our citizens.

It is in this regard that the African Union welcomes and supports the initiative of the International Telecommunication Union (ITU), the World Bank Group and the United Nations Global Alliance for ICT and Development (GAID), in partnership with the African Development Bank (AfDB), the African Telecommunications Union (ATU), and the UN Economic Commission for Africa (ECA), to organize the *Connect Africa* Summit in Kigali, Rwanda, aimed at taking concrete steps to ensure universal connectivity for our continent, through using our own resources and through international cooperation.

In precise terms, I expect the summit to address Africa's concerns about poor infrastructure, the high cost of access to information and knowledge, and development of the requisite human resources for the promotion of a sustainable and inclusive information society on the continent and beyond.

On behalf of the African Union and on my own behalf, I am grateful to my brother, His Excellency President Paul Kagame, for accepting to host this important continental event and I wish the summit fruitful deliberations.

AFRICA'S PRIORITIES

FROM THE DOHA CONFERENCE

Sami Al Basheer Al Morshid

Director of the ITU Telecommunication Development Bureau (BDT)

ITU

ITU's development work in Africa

At the fourth World Telecommunication Development Conference (WTDC-06) held in Doha, Qatar, in March 2006, Africa put priority on five initiatives. These concern building human and institutional capacity; reinforcing and harmonizing policy and regulatory frameworks for the integration of African information and communication technology (ICT) markets; developing broadband infrastructure for regional interconnectivity; designing and implementing a multipurpose Internet protocol platform for ICT applications, and introducing new digital technologies for radio and television broadcasting.

ITU's Telecommunication Development Sector (ITU–D) is directing the Union's efforts to help achieve these goals through the ITU Regional Office in Africa and the Projects and Initiatives Department established at the beginning of this year. It is expected that large-scale projects will be implemented in partnership with the public and private sectors, as well as with international, regional, national, technical and financial institutions. This article highlights some of the work under way.

Expanding training opportunities

First, it is intended to provide the region with comprehensive human resource management and development plans. A database of African ICT experts will be compiled, with the objective of optimizing the use of their skills. In addition, training programmes will be harmonized across the continent and its two Centres of Excellence will be expanded to a network of excellence, by building on the comparative advantages of face-to-face and e-learning opportunities in Africa.

One of the centres, in Nairobi, Kenya, is for English-speaking countries in Africa, and is coordinated by ITU in partnership with the African Advanced Level Telecommunications Institute (AFRALTI). The other is the *Ecole Supérieure Multinationale des Télécommunications* (ESMT), based in Dakar Senegal, and serving French-speaking countries. We are now looking into establishing a Centre of Excellence for Spanish and Portuguese-speaking countries in Africa. We will be developing training modules and updating existing training programmes, including exploring those used in countries of Latin America.

Creating an environment to nurture ICT

An environment that attracts investment and facilitates growth is one of the key factors needed to promote the development of ICT infrastructure. In 2004, ITU launched a project, financed by the European Commission, to help create such an environment in West Africa. In 2005, regulators from 15 countries agreed on a common regulatory framework to govern their national ICT markets. The agreement marked a turning point for West Africa, which seeks to create a single market based on the European Union model.

The framework's guidelines mirror a market-based approach to the provision of ICT services, and are designed to spur investment in the countries concerned: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. The Supplementary Acts were adopted on 19 January 2007 by the Heads of State and Government of the Economic Community of West African States (ECOWAS). The Acts cover ICT policy, interconnection, numbering, spectrum management and universal access. ECOWAS Member States will now move towards translating these decisions into national legal frameworks. The work carried out by ECOWAS countries will certainly serve as a basis for harmonization across the continent as a whole.

ITU will continue to support efforts to establish regulatory bodies and liberalize markets in Africa. Also, assistance will be provided in the national and regional implementation of reforms adopted through the *Green Book*. The second, revised edition of this publication will give African countries comprehensive tools and guidelines for migrating to new technologies.

A better environment for ICT will also help to connect the majority of Africans, who live in rural areas. According to ITU statistics, the number of mobile subscribers in Africa soared from 16 million in 2000 to 193 million in 2006, and is projected to reach 278 million subscribers by the end of 2007. However, this growth is taking place mainly in urban areas. For example, ITU estimates that although at least half of the inhabitants in rural Africa are covered by a mobile phone signal, fewer than 10 per cent of households have a mobile phone. Efforts must be made — through public-private partnerships, Universal Service Funds and other means — to close the access gap.

Digital broadcasting

The switch-over to digital broadcasting is to take place in Africa by 2015, according to a plan agreed at the ITU Regional Radiocommunication Conference in June 2006. To promote the implementation of digital broadcasting, an upgraded television broadcasting infrastructure will be planned for Africa. This will include improving spectrum management to ensure that resources are available for new services, and providing assistance to countries to optimize their national frequency allocation plans.

Support to NEPAD

With ITU's help, the New Partnership for Africa's Development (NEPAD) has completed phase one of its project to define the scope and level of support required to achieve objectives in the ICT sector. ITU will support implementation of specific activities in phase two of the project, which is expected to be completed in 2010. One such activity is the "e-Schools project" led by the NEPAD e-Africa Commission.

Broadband Africa

ITU's regional initiatives place a special emphasis on fully equipping Africa with broadband infrastructure. At present, the picture is patchy. The high-speed Internet services needed for business, government and consumer applications continue to be either very expensive or unavailable. Broadband penetration is below 1 per cent in Africa, compared with close to 30 per cent in some high-income countries.

However, this gap is not only a challenge; it is also an attractive investment opportunity. New players are entering the market seeking to repeat the successful experience of mobile telephony in Africa. This has increased the need for coordination between public and private sector partners, so as to create a coherent infrastructure across the region. The long-term objective is to spread affordable connectivity throughout the continent. Meanwhile, the immediate goal is to connect all African capitals and major cities by 2012.

PhotoDisc

Over the last decade, much work has been done to upgrade analogue networks to digital microwave and fibre-optic links across national borders. Regional organizations have been very active in these efforts, and in some areas major operators have played a leading role in expanding links to neighbouring countries. The explosive growth of mobile communications in Africa has had a significant impact too.

In the absence of adequate capacity being made available by incumbent fixed-line operators, many mobile operators have built their own networks and now own about three-quarters of Africa's operational backbone network infrastructure. With the continuing liberalization of telecommunication markets, mobile operators that provide services in contiguous countries might seek to interconnect their systems, thus forming regional backbones. But because mobile networks can only be used by the operators that own them, they do not qualify as national backbone links.

A recent assessment conducted by ITU concluded that, in addition to the existing infrastructure, Africa needs at least 52 040 kilometres of backbone infrastructure for connectivity within and among countries. Building broadband links among African capitals and major cities by 2012 would serve as the foundation upon which connectivity could be achieved across the continent, including affordable access in rural areas. ITU estimates that some 55 per cent of the total rural population of sub-Saharan Africa remains without access to ICT. New wireless technologies promise to offer new possibilities for extending access to rural areas.

The first steps have already been taken to achieve the goal of interconnecting Africa's capitals and major cities. But we must continue our work to identify the gaps in both broadband infrastructure and the investment needed to build it. ITU will continue to support African countries in creating the right environment, mobilizing resources and designing and implementing broadband projects. By connecting the continent in this way, Africa will truly join the information society. ■

POLICY AND REGULATION
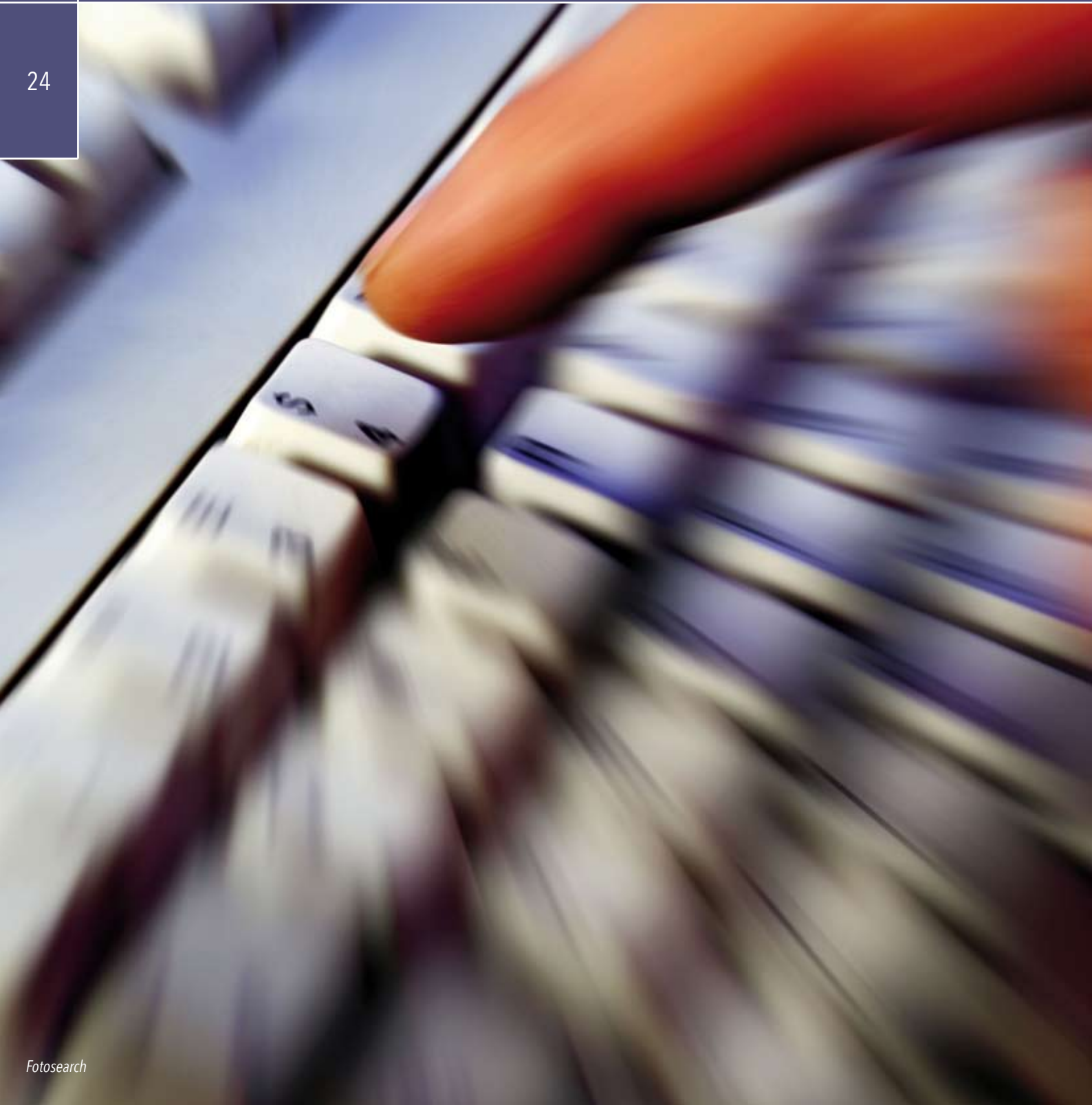
Tarek Mohamed Kamel

Minister of Communications and Information Technology, Egypt

ITU/J.M. Ferré

Bridging the digital divide in Africa: from diagnosis to implementation

Information and communication technologies (ICT) are an essential tool for development in Africa. The coordinated efforts of government institutions, development partners, the private sector, and civil society are essential to accomplishing developmental goals by using ICT. The task of development is a difficult process, but through political will, coordination and resource mobilization, conditions will be improved for all citizens of Africa. The timeliness of the *Connect Africa* Summit provides us with an opportunity to make a real difference.

As an international ICT community, we have been meeting over the past few years to diagnose the problems facing ICT development and to make recommendations for bridging the digital divide. Most notably, the World Summit on the Information Society (WSIS), organized by ITU in 2003 in Geneva and 2005 in Tunis, created a momentum in Africa to promote ICT for development. The "African Regional Action Plan on the Knowledge Economy" was formulated and almost 90 projects were identified by stakeholders. The African Union has taken on the challenge of pushing the agenda forward and, in 2006, established the Conference of Ministers of Communications and Information Technologies, which is currently chaired by Egypt. The Bureau of the Conference of Ministers endorsed the selection of 11 flagship projects that aim to improve such necessary elements

as infrastructure, education and capacity building (including leadership development), women and youth empowerment, financing, and access to ICT.

As human resource development is deemed crucial for taking full advantage of opportunities available in the new, global, information-based economy, Egypt proposed the development of an *"African Regional Leadership Training Programme for ICT Professionals"*. The aim is to leverage the individual experiences and capacities of promising, mid-career potential leaders in African countries, so that they become agents of change in the ICT sector. Delivered in selected qualified training centres and institutions around the continent, this programme should provide first-hand experience of the ICT sector in the five sub-regions of Africa.

Access to ICT is also an issue of the utmost importance. In many cases, lack of proper infrastructure is the single greatest barrier — or at the very least the first barrier — to bridging the digital divide that stifles development. At the *Connect Africa* Summit, as we discuss the infrastructure gaps in our continent, we have to keep in mind our roles and responsibilities in reaching successful and effective implementation of ICT projects. Investment requires harmonized regulations, a business-enabling environment created by the government, participation and acceptance by civil society, and

Fotosearch

capacity building and infrastructure from the private sector and development partners. Investing in infrastructure, such as regional ICT backbones and Internet exchange points, will not only give millions online access, but will also reduce the transaction costs necessary for profitable businesses.

In Egypt, the ICT sector has enjoyed sustained double-digit annual growth of up to 25 per cent, compared to 7 per cent for the national economy. With a solid infrastructure and a qualified human resource base, coupled with ICT reform, deregulation and public-private partnerships, we were able to attract foreign direct investment and significantly con-tribute to the national treasury. Our national ICT strategy up to 2010 aims at deepening the penetration of ICT in our society by leveraging successful e-access initiatives and de-ploying effective ICT for development pilot projects in edu-cation, health and e-content on a national scale. Innovation features prominently in our strategy, in order to make use of Egyptian intellectual talent at home and abroad. We are proud to put our experience and resources at the disposal of our sisters and brothers in Africa.

We also welcome ITU's initiative to bring us together to focus on connecting Africa to achieve the United Nations Millennium Development Goals. The gathering of key stake-holders in Kigali is a demonstration of our commitment to mobilizing resources to expand ICT infrastructure in Africa. Our goals are not impossible, and I believe the *Connect Africa* Summit is an excellent opportunity to move forward in our plans to create change on the ground and improve the lives of our people. ◼

Patrick Masambu

Executive Director, Uganda Communications Commission

Backbone infrastructure – A gentle reminder

With the growing awareness of the immense potential of information and communication technologies (ICT) to influence a country's development path, the timing of the *Connect Africa* Summit could not have been more opportune. In Africa today, there is an urgent need, being expressed at various levels of society, and a responsibility to build reliable, sustainable and high-quality infrastructure for transmission and delivery of the numerous ICT applications currently on market. The need, therefore, to put in place solid infrastructure projects that will enable Africa move up the ladder in ICT development cannot be over-emphasized.

This summit, I believe, will provide valuable insights for policy formulation in a practical, results-oriented format, as well as provide a high-level opportunity for the consideration of the most appropriate principles and processes of regulation. In a nutshell, the issues that are going to be discussed are critical for Africa to take into account in order to make major strides in its quest to meet the United Nations Millennium Development Goals.

By tackling the challenge of expanding broadband backbone infrastructure using diverse models, this summit will be addressing the real issues that will propel Africa into the global ICT mainstream. In Uganda, just as in many other developing countries, the estimated requirements of infrastructure are huge and call for an enormous amount of resources. It is in this context that one may argue that a single approach which presumes that all requirements can be delivered by either the private sector or by the government alone may not be appropriate.

Both domestic as well as international sources of funding need to be tapped. What is of paramount importance, though, is the creation of an investment-friendly climate. And this starts with the development and implementation of clear and consistent policies. On the part of investors, there is a need for them to have a long-term view and approach while participating in the funding of any infrastructure.

PhotoDisc

Clearly, as we explore ways of improving connectivity in Africa, high-capacity backbones are paramount if we are to simultaneously achieve major development goals in the areas of communications, health, education and governance. The choice of technologies therefore, be they fibre or wireless, will be an important ingredient in the overall solution. That having been said, it is not necessarily a contradiction for regulators to observe technology neutrality while at the same time promoting new technologies. It is also in this regard that we need to salute and support the various regional initiatives that are under way to fill the existing void so that we may achieve a reduction in the cost of communication for the majority of our people.

In addition to backbone infrastructure development, the issue of human capacity development remains a real challenge for Africa, and particularly with the advent of new technologies. There is a dire need for the continent to engage in massive training programmes for our people if we are to develop the pool of skills needed in the information economy. Proper training and skills development will, therefore, need to be part of the package as we aspire to connect Africa. This is an area where the industry could play a leading role.

Because ICT is an enabler and not an end in itself, one of our major challenges is to harness ICT for human development. And to effectively do so will require awareness-raising and consensus-building across all levels of society. Key policy-makers and stakeholders need to make informed decisions about technologies that are most appropriate for their contexts and needs. Understanding how ICT can service specific development goals will require some knowledge of appropriate technologies and fundamental appreciation of how they can be deployed to address concrete problems.

The *Connect Africa* Summit offers us the best opportunity to harness the power of ICT and chart the way forward as we all work to rapidly develop communication infrastructure for the integration of the continent, enabling trade, social and cultural exchange to take place with ease and affordability.

As we all prepare for the summit, one of the many questions we may wish to ask ourselves is: what key policy options and regulatory conditions would constitute the enabling environment that is needed for public-private partnerships to deliver backbone infrastructure to connect Africa? ■

Tom Phillips

*Chief Government and Regulatory Affairs Officer,
GSM Association*

GSMA

Bringing mobile broadband to Africa

Across Africa, Asia and Latin America, mobile phones are plugging the gaps in the fundamental infrastructure that countries need for social and economic development. Mobile phones are being used for voice calls; for text message services disseminating information on health care, agriculture and weather forecasts; for Internet access, and even for transferring money. All this compensates for poor roads, a scarcity of fixed-line telecommunications and a patchy banking network.

Mobile telephony is filling this void because economics is on its side. The capital cost of providing mobile coverage to an individual is one-tenth of the cost of installing a new fixed-line connection, according to the World Bank. And studies by the London Business School and Deloitte have found that there is a major payback for developing countries that cultivate an environment in which mobile services can flourish. An increase of 10 percentage points in the proportion of a population using mobile services can boost a country's annual economic growth by between 0.6 and 1.2 percentage points.

The cost of low-end mobile handsets, now approaching USD 20 at wholesale prices, has fallen dramatically in recent years, fuelling rapid growth in mobile usage. There are currently 1.2 million new connections every day. However, the retail price of handsets and mobile services is often artificially inflated by taxes, import duties and unnecessary regulations, reducing their beneficial impact on societies in desperate need of better communication infrastructure. If current trends continue, we believe the cost of an access device will remain too expensive for up to one-and-a-half billion of the poorest people worldwide for the foreseeable future.

The best way to open up telecommunications and Internet access to these people is through some kind of shared facility. To that end, the GSM Association (GSMA), through its Development Fund, is coordinating projects designed to encourage entrepreneurs in the developing world to set up businesses that provide people with access to a mobile phone or Internet terminal as and when they need it.

GSMA

In Bangladesh, for example, mobile operator Grameen-phone is using its network to connect hundreds of centres, run by local entrepreneurs, to the Internet. Local people use these centres for a wide variety of business and personal purposes, such as looking up market prices, contacting relatives overseas, hunting for jobs or seeking medical aid.

We believe the same concept could bring mobile connections to some of the world's most disadvantaged and vulnerable people — refugees. The GSMA's Development Fund, in partnership with the United Nations High Commissioner for Refugees, MTN mobile operator in Uganda and equipment supplier Ericsson, is setting up a pilot programme to provide refugee camps in northern Uganda with affordable and sustainable access to a wide range of services, from voice calls to Internet access to e-learning programmes.

Today, many of these services are delivered via GSM networks, with software for enhanced data rates for GSM evolution (EDGE), providing download speeds of about 120 kbit/s. These services would be more effective and efficient if they could make use of third-generation (3G) networks enhanced with high-speed packet access (HSPA), which have much greater capacity than their second-generation counterparts and can offer users broadband speeds.

So far, 128 operators in 64 countries have deployed HSPA networks. As the number of users rises, HSPA handset makers are gaining economies of scale, enabling them to lower prices. Thanks to this virtuous circle, HSPA has the potential to fuel a broadband revolution in the developing world similar to that now sweeping through Europe, North America and parts of Asia. Broadband enables all kinds of services (from remote health care to e-learning to video sharing) to be delivered much more rapidly and efficiently. But one thing stands in the way — a shortage of radio-frequency spectrum.

While some African countries, such as South Africa and Egypt, have issued 3G licences enabling operators to provide HSPA services in the 2 100 MHz spectrum band, governments should also allow mobile operators to use their existing GSM spectrum to offer HSPA. The greater range of radio waves in lower spectrum bands and their ability to provide better coverage in buildings would enable operators to achieve much broader 3G coverage, particularly in rural areas. A 3G network in the 900 MHz band would achieve up to 40 per cent greater coverage than a 3G network in the 2 100 MHz band for the same capital expenditure, according to a study by Ovum for the GSMA.

But if HSPA is going to realize its potential to deliver broadband services to large numbers of Africans, new spectrum will also be needed. One of the main topics for discussion by government officials attending the World Radiocommunication Conference (WRC-07), which ITU will host in Geneva from 22 October to 16 November, is how to release the UHF spectrum freed up by the switch from analogue to digital television.

A substantial chunk of that spectrum, preferably in the 750 MHz to 850 MHz band in Europe and Africa, needs to be reserved for mobile communications so that broadband services can reach as many people as possible. A WRC is only staged every three to four years, so WRC-07 should reserve this spectrum now for mobile services. If the same spectrum bands are used for mobile services worldwide, manufacturers will achieve major economies of scale, making broadband access devices affordable for ordinary people in developing countries.

Spectrum is the oxygen of this industry. The WRC in Geneva is a golden opportunity for governments to open the door to mobile broadband services that could, quite literally, transform the social and economic landscape in Africa and other parts of the developing world. ■

THOUGHTS AND IDEAS

Abdullah Bin Mohamed Bin Saud Al Thani

Chairman of Qatar Telecom (Qtel)

Qtel

Sharing experience

Telecommunications has grown to be an intrinsic and essential part of everyone's life. From the world's largest businesses, to interconnected governments, to the average family, it is copper wires, fibre-optic cables, wireless radio signals and satellites that are keeping us all connected. Qatar Telecom (Qtel) is proud to be such a telecommunication provider for the people of Qatar and increasingly, as it expands its operations overseas, for customers around the world.

As the host for the World Telecommunication Development Conference in Doha in March 2006 (WTDC-06), Qatar promised that it would share its experience in managing the convergence of telecommunications, computing and multimedia applications. Convergence offers many opportunities for collaboration between the public and private sectors, as innovative new applications and possibilities present themselves. Our experience in Qatar has shown us the importance of such collaboration. Experts from the ICT sector are working closely with government to ensure that we can take full advantage of the opportunities presented by the advent of the global information society.

Qatar is moving at a frenetic pace, the market and the economy are growing faster than anyone anticipated — not just telecommunications but also other sectors. Qtel has been

in operation since 1949. Until 2006, the company had exclusive rights to operate fixed, wireless, as well as cable and satellite television networks in Qatar. Qtel supports the process of liberalization and is playing a comprehensive role in the establishment of effective competition in the Qatari marketplace. In the last three years, Qtel has invested the equivalent of USD 275 million each year in installing and commissioning world-class fixed and wireless networks and robust and reliable infrastructure, to ensure that Qatar's residents and business customers can benefit from, and become active players in, the global market. With over 116 per cent penetration in Qatar, it was only logical for Qtel to find newer avenues beyond its home shores.

Following ambitious expansion plans, the Qtel Group has rapidly diversified to operate in 15 countries within just over six months in 2007. Through its subsidiary and associate companies, the Qtel Group covers a population of 527 million, with a total subscriber base of over 13 million. We have already established operations and created partnerships that are important building blocks for our future strategy. Qtel's acquisitions are in tune with the company's international growth strategy, which is based on three pillars: consumer wireless markets, fixed wireless, and Managed Data Services.

Siemens

Qatar and Qtel

In Qatar, new businesses are setting up operations every day. In order to prosper, they need access to world-class telecommunication products and services. Qatar is also witnessing a growth in population, for which Qtel reserves special treatment in terms of the development of new services. Qtel has a mobile customer base of 1 108 000 and roaming agreements with 217 operators in 104 countries. It is one of the few telecommunication operators that can boast of delivering 100-per-cent broadband connectivity throughout its market. Using wireless local loop (WLL) technology, even the remotest corner of Qatar can be connected to its broadband network.

As the Prestige Partner and official telecommunication provider to the 15th Asian Games in Doha in 2006, Qtel invested over USD 137 million in upgrading its network and infrastructure. The Asian Games gave us the opportunity to build and advance our infrastructure and invest in state-of-the-art services; an investment that will continue to benefit Qatar, its citizens and businesses for many years to come.

We have also introduced a number of "firsts" in the region. These include digital video broadcasting over handhelds (DVBH) which provides live television to special mobile handsets; a triple-play service that offers voice, Internet protocol television (IPTV) and broadband connectivity over one asymmetric digital subscriber line (ADSL); a terrestrial trunked radio (TETRA) system used for industrial purposes, including the Asian Games; 3G mobile communications, which allow people in Qatar to make international 3G video calls to over 50 countries worldwide; and finally, our new service, *Mozaic*.

Our launch of the *Mozaic* entertainment service, offering customers a fully converged digital multimedia experience, expanded our role to one of content provider. *Mozaic TV* brings together high-quality voice services, broadcasting and on-demand IPTV, along with Wi-Fi broadband Internet access – all over one ADSL. *Mozaic Mob* transforms the mobile handset into a multimedia and entertainment device. Qtel also recently launched a Real Estate Managed Services solution, providing end-to-end managed services for the emerging real estate market in Qatar and the region as a whole. With packages like these, Qtel continues to provide customers with advanced, innovative technologies that add to the richness of life in Qatar.

WTDC-06 in Doha succeeded in defining the objectives and priorities for every region of the world to achieve economies of scale in ICT development. With the Doha Declaration and Action Plan, we have the commitment and the tools to bridge the digital divide. The *Connect Africa* Summit in Kigali is an important step in this direction. ■

Orlando Ayala

Senior Vice President, Microsoft Unlimited Potential Group

Microsoft

Tapping unlimited potential

Thirty years ago, in the early days of the information technology revolution, it was Microsoft Chairman Bill Gates' dream to see computers become a tool for the individual through the magic of software – a tool for personal empowerment, creativity and communication, available to everyone.

Today, this has become a reality for nearly a billion people – the fastest take-up of technology in human history. It is a good start, but if you believe, as I do, that every human being has unlimited potential, and that technology can play a key part in unlocking that potential – especially through participation in education and enterprise – then reaching the next 5 billion people has to be a priority for us all.

We have all learned a great deal, especially in the last decade, about the role of technology in driving growth, innovation and development for communities and countries. In particular, we have learned about the importance of complementary investments and multi-sector partnerships across education, e-government and infrastructure, and of transparent, pro-competitive policy frameworks. Some of what we know works to accelerate the "ICT development dividend" comes from important initiatives here in Africa, while some of it comes from other parts of the world, both developing and developed.

This is why the *Connect Africa* initiative is so important – as a clear demonstration of commitment by all stakeholders to build on the progress already made by many African countries, to share best practice and to catalyze further innovation, investment and results. Across the continent, this concept of partnership and collaboration is moving the paradigm of aid onwards to building a competitive Africa, with technology at the heart of delivering sustainable development.

This is why Microsoft is part of the *Connect Africa* initiative – as a long-term partner and investor in Africa, working alongside local non-governmental organizations and national governments, as well as pan-African organizations and the United Nations' specialized agencies, to help bring affordable ICT into the classroom, the community, the local economy and e-government.

We share the summit vision of going beyond basic information technology access, and building a thriving, competitive, technology and knowledge-based Africa. In particular, we welcome the special focus on young people – to allow the youth of Africa to succeed, on a larger scale than anyone ever thought possible.

Through our commitment of partnerships and programmes, known as Microsoft Unlimited Potential, we aim, for example, to bring ICT training and affordable ICT access to more than 45 million students and small business people across Africa by 2010. We are developing new business models to accelerate access without sacrificing quality. And we are investing in, and partnering with, local firms and local innovation centres of excellence to help spur growth in the local technology sector and the wider economy.

As someone who travels around the globe, I am not saying that technology is a development fix-all. We know that ICT does not solve conflict, or disease, or automatically lead to good governance. But it *does* enable people to make breakthroughs where they are most needed – in education, health care, government services and so on – by enabling broader reach of resources, and by empowering people to do more and to expect more. And I believe that the people of Africa, like people everywhere, can do great things with these opportunities.

We realize that simply increasing connectivity or distributing computers and software will not impact development unless a set of other factors converge to make this possi-ble within the larger setting of a developing "knowledge economy". Resources must be matched by resourcefulness, combining with other initiatives by local leaders, educators and entrepreneurs to achieve individual and institutional objectives. Factors such as the quality of the regulatory environment, the acquisition of appropriate skills, and the availability of communications infrastructure are essential to enable individuals, organizations and government to exploit the benefits of ICT.

The great thing about the *Connect Africa* initiative is that it focuses in tandem on these enabling factors and on catalyzing more investment in "initiatives that work" as well as innovative new pilots. This means that *Connect Africa* can and should be a major accelerator of Africa's development. Our progress should be measurable not just in GDP growth but also in creating millions of new opportunities and success stories in individual people's lives.

On behalf of Microsoft, I want to commend ITU and its global and African partners for convening the *Connect Africa* Summit, and pledge our ongoing support. We look forward to working together to connect Africa and enable everyone in Africa to realize their full potential. ■

A. Reza Jafari

Chairman of the Board, ITU Telecom and
Chairman and CEO, e Development International

Connect Africa is the tipping point of the knowledge economy

History proves that bold actions can result in extraordinary outcomes that affect the lives of a vast majority of the world's citizens. ITU's *Connect Africa* initiative has this potential, as it can have a significant impact on achieving the United Nations Millennium Development Goals by the target year of 2015, and be the tipping point at which Africa is welcomed into the world of knowledge generators in the global information society.

The action and foresight of progressive leaders in Africa has opened a chapter of hope for progress and prosperity. The era of charity for Africa is now in the past. The new message is loud and clear: Africa does not need fish for its hungry people; rather, it needs to learn how to fish. Poverty alleviation is no longer good enough. We must help Africa to generate wealth through a programme that is phased in as quickly as possible. The time is ripe for all stakeholders to commit themselves to taking action.

Using Africa's resources
What was once called the "dark continent" contains a richness of raw materials used to fuel the economic growth and prosperity of western countries. Yet, for many years, citizens of Africa did not have access to technological advances that were critical for transforming raw material into value-added finished products.

The most ignored and underused resource in Africa is the magnificent capacity of its people, especially the new generation of leaders and professionals. These young leaders have in their hands and minds a power that can only manifest itself in one way — to transform the world for the better for all of us, and for many years to come. This generation is committed to transforming Africa into a knowledge society that provides a better standard of living for all.

The power of ICT
As a vital element of infrastructure, information and communication technologies (ICT) play a significant role in the transformation of Africa into a region that generates knowledge. Sustainable capacity building means there will be "No Limits to Growth" in Africa. Many members of the ICT industry have long realized this potential, and have long been involved in and have contributed to the economic development of our communities and our nations. During the past 15 years, ICT has created more than one million jobs worldwide, directly or indirectly, due to the proliferation of mobile communications and electronic commerce. Thousands of these jobs have been created in the developing world and emerging markets. Although this is not enough, it is a promising beginning.

World Bank

According to a study reported in the Policy Paper Series of Vodafone (March 2005), the penetration rate of mobile communications is a positive factor in the quality-of-life indicators of many developing countries. These indicators include longer life expectancy, lower infant mortality and lower illiteracy. This contribution is not limited to the developing world.

Emerging markets are seeing the world's fastest growth for ICT, particularly mobile communications. This has the potential to raise the standard of living for millions of people, giving them a better life and a better future. Mobile subscribers are projected to surpass 3 billion worldwide by late 2007 and to reach 4 billion by 2010, with 80 per cent of new growth expected to come from lower-income emerging markets. Mobile phone usage in Africa is growing almost twice as fast as in any other region. Investment in ICT infrastructure in Africa was to the tune of USD 8 billion in 2005, up from USD 3.5 billion in 2000. Even more growth can be expected if mobile services are made more affordable.

Data communications and broadband can make an additional contribution to this growth opportunity. Many applications, such as mobile workforce management, e-learning, e-government, e-health and electronic commerce, create more efficiency in the delivery of services and contribute to better user experience and improved standards of living.

Action throughout the ecosystem

Achieving this transformation through ICT involves multi-faceted issues and a multitude of entities. The ecosystem comprises the private sector, policy-makers, regulators, civil society and customers. The development of any solution or action requires these entities to collaborate and to sustain an ongoing and constructive dialogue.

We all have a task to do. We must develop public and private partnerships with higher educational institutions to train the next generation of leaders for industry, government and society. The regulatory authorities should create ways to facilitate and not hinder progress. Policy-makers should create more efficient tax incentive systems and encourage more long-term foreign investment. The *Connect Africa* initiative will promote the inclusion of these critical items on the action agendas of all elements of this ecosystem, and so truly help to create sustainable growth in Africa. ■

INFRASTRUCTURE DEVELOPMENT

Dr Jones A. Killimbe

*Director General and Chief Executive Officer,
Regional African Satellite Communications
Organisation (RASCOM)*

RASCOM

Connecting Africa

Achieving connectivity in Africa is a major challenge across land, sea and air. It is even more challenging in the telecommunications sector, which has a multiplier effect on all other development sectors. This is due to the severe lack of backbone telecommunication infrastructure in Africa. The basic challenges for Africa in the telecommunications sector are the lack of connectivity, accessibility and affordability. Countries are not connected to each other, and even within their borders there are wide disparities between urban centres and rural areas. Deliberate efforts must be exerted to ensure that rural Africa, in particular, is integrated into the information society.

Access to information and communication technologies (ICT) is no longer considered a privilege, but a tool for achieving economic development and poverty reduction. However, due to the sparsely distributed population in Africa's vast rural areas, coupled with their distance from more developed towns, it is expensive to install and operate terrestrial telecommunication networks. Satellite systems are, therefore, one of the most appropriate ways to enable Africa to address its requirements, because of the systems' broad geographic coverage and ability to serve many users at the same time and at the same price.

Although there are many satellites covering the continent today, Africa continues to pay several hundreds of million US dollars every year on telecommunication traffic to and from Africa via satellite through foreign operators. This not only makes our services unaffordable, but also limits interconnections among African countries.

Other challenges facing Africa as it seeks to implement ICT backbone infrastructure projects include the lack of capital investment in the telecommunication sector by African financial institutions. Infrastructure projects are inherently capital-intensive with very long pay-back periods. At the same time, they can be very lucrative investments. Foreign direct investment alone cannot be expected to solve this challenge without the active participation of African investors. The good news is that the trend is changing where African financial institutions are beginning to see the need to support this sector which has so much influence on development as a whole.

Telecommunication infrastructure projects
Several telecommunication infrastructure projects are being undertaken in Africa. Some are at the stage of feasibility studies, some at the financial mobilization stage, while others are being implemented. Those that have been fully implemented are yielding results in terms of connectivity

Zil

at national, sub-regional and continental levels, including projects by RASCOM, COMTEL, INTELCOM II, EADTP, SRII, SAT3/WASC/SAFE, EASSy, and NigComSat. All these initiatives must be given support, as they will complement one another to create a total solution for Africa.

ITU has clearly indicated that "connectivity in Africa can only be addressed as a continental initiative focusing on all 53 African countries". Among all existing connectivity infrastructure projects in Africa, the only one that meets this definition is the Regional African Satellite Communications Organisation (RASCOM) project.

The RASCOM project
Feasibility study
More than 600 national experts from the 50 participating African countries helped to complete the study. Its aim was to discover whether a regional African satellite system, integrated with a terrestrial system, is viable, and to formulate proposals for the implementation of such a project. The study led to the establishment of RASCOM, whose core objectives are connectivity among African countries to reduce transit telecommunication costs, creating access to rural Africa, and supporting voice, Internet, television and radio transmissions.

The RASCOM Pan-African Satellite system
The construction of the first RASCOM Pan-African Satellite system started on 20 June 2003 and was completed in May 2006. It will be launched in December 2007.

The space segment
The RASCOM payload is designed to address specific connectivity requirements for the entire continent. The satellite covers all of Africa with two spot beams in the Ku-band and a continental coverage in the C-band (see Figure 1 on page 42). The associated ground segment is further simplified by high effective isotropically radiated power (e.i.r.p).

Ground segment
The satellite control centres will be established at Gharyan, near Tripoli in Libya, and in Abidjan, Côte d'Ivoire, creating a back-up system for each other. Similarly, the network operation centres will be established in Banjul, Gambia, and Douala, Cameroon.

The ground traffic segment will incorporate gateways and RASCOM terminals. These terminals are designed to support multimedia access (voice, Internet and broadcasting) for rural communities in Africa.

Getty Images

Figure 1 — The RASCOM system
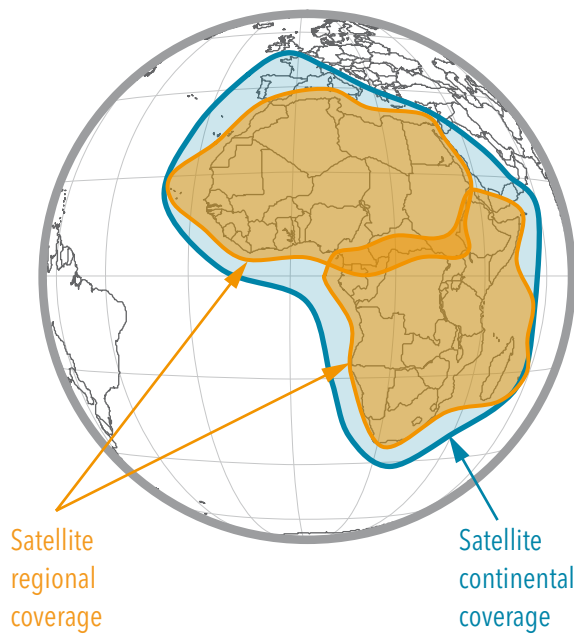
Coverage topology

Combination of Ku-band
and C-band coverage:
» The Ku-band coverage
   is divided into 2 regional
   spot beams
» A single continental C-band
   beam covers all of Africa and
   associated islands, parts of Europe
   and the Middle East

Satellite
regional
coverage

Satellite
continental
coverage

Services to be offered

The satellite will offer a wide range of services, grouped into three categories: intra-African connectivity, rural access and band lease services. There is a deliberate focus on rural areas.

Intra-African connectivity

Despite the existence of satellites over Africa and fibre submarine cable systems, a large part of intra-African traffic continues to be routed via external transit centres, with transit fees paid in millions of US dollars every year. RASCOM aims to facilitate intra-African traffic and reduce these transit costs.

Connectivity-on-demand services (DAMA) will provide direct interconnection on a call-by-call basis within the continent, thus addressing the question of affordability.

Rural communication services

The RASCOM satellite will provide rural communication services using terminals designed specifically for that purpose.

Band lease services

These services which will be based on classical satellite bandwidth capacity leasing, among other methods, will facilitate trunking throughout the continent, including part of southern Europe and the Middle East; broadcasting; Internet access; GSM backhauling, and VSATs for corporate networks.

Financing mechanism

The financing structure of the RASCOM satellite system is a mix of partnerships. A typical example of a public-private partnership arrangement is shown in Figure 2 on page 44.

The way forward

Financial support for operators

With the imminent launch of the first pan-African satellite system by RASCOM in December 2007, there is a need for all African telecommunication operators to develop and/or upgrade their ground networks in order to use the system. This requires funding. Through "Connectivity Africa", those operators requiring funds to develop their ground networks could be identified in such a way that these funds would be tied to rural connectivity only.

Figure 2 — Financing approach: public-private partnership structure

RASCOM

| RASCOM for 38 African operators and BOAD | GPTC | Thales-Alenia (France) | LAIP |

Equity financing

RascomStar-QAF

Development banks:
LFB
AfDB
BOAD
BDEAC
IsDB

Revenue stream

Customers

Abbreviations:
GPTC   General Posts and Telecommunications Company of Libya
LAIP   Libya African Investment Portfolio
AfDB   African Development Bank
BOAD   West African Development Bank
BDEAC   Central African Development Bank
IsDB   Islamic Development Bank
LFB   Libyan Foreign Bank

Alcatel-Lucent

Harmonization of policies and regulatory frameworks in Africa

RASCOM's focus is on integrating the whole continent via satellite. For this and many other initiatives to succeed, it is imperative that policies and regulatory frameworks in Africa are harmonized. The African Union Commission has initiated a study on the harmonization process, which can be enhanced in order to avoid duplication of effort.

Human capacity building

Human capacity building is an important component for the success of ITU's *Connect Africa* initiative. African experts must be trained to sustain the planned projects. Training should focus on key commercial areas, finance and management.

Conclusion

In the global information society, connecting Africa is a major challenge. There is a need for sustained political will and support from the African leadership. This type of leadership has been demonstrated in the RASCOM project. Its recognition as the only continental ICT flagship for Africa within the framework of the NEPAD ICT Initiatives underlines the importance of the project in the socio-economic, political and cultural development of the continent.

Work should also be geared towards use of shared facilities, in order to exploit economies of scale and thereby cut costs to end users. There is also a need to differentiate sub-regional connectivity projects and continental ones. RASCOM's experience has shown that some sub-regional projects are given more priority than continental ones. At the end of the day, the prime objective should be connecting Africa. ■

FINANCING

Walter Fust

Director-General, Swiss Agency for Development and Cooperation (SDC)

Financing for Development – a need for new thinking and innovative action

A well working and affordable ICT infrastructure is essential for sustainable development, and for all actors involved.

To realize such an infrastructure, an enabling environment conducive to private-sector investment is essential. In recent years, the private sector has internationally led ICT infrastructure investment. Governments and international financial institutions have focused their efforts on reforming ICT policy and the regulatory environment, stimulating private-sector investment through the use of creative financial mechanisms, including public-private partnerships, and addressing infrastructure gaps through mechanisms such as Universal Access/Service Funds.

A key priority of donor agencies is to fund efforts to facilitate regulatory reform. At the same time, agencies should encourage regulators to broaden their focus from oversight of the traditional telecommunication and broadcast sectors, so as to embrace the new spectrum of the emerging digital technologies (including their affordable applications, content and educational layers) that are so important to economic and social development.

In addition, there are clearly special challenges in providing ICT infrastructure in remote areas where there is insufficient commercial potential for building networks. There is a clearly identified need for finding new solutions. It is in this spirit that the Swiss Agency for Development and Cooperation (SDC) has committed itself to supporting the *Connect Africa* Summit in Kigali, Rwanda, to make a tangible contribution for finding innovative solutions to the challenges ahead; that is, to bring the benefits of ICT for Development to the people. ■

Dr Ahmad Mohamed Ali Al-Madani

President of the Islamic Development Bank

Supporting ICT for development

The Islamic Development Bank (IDB) is a multilateral development bank established to foster the economic development and social progress of its member countries and Muslim communities in non-member countries, particularly in Africa. In this respect, information and communication technologies (ICT) play a significant role and have been recognized as a catalyst to help achieve the United Nations Millennium Development Goals and IDB's "2020 Vision". Fostering the access of Africans to ICT will help contribute to the overall development of the African continent. ICT can improve the quality of education in Africa, boost productivity, competitiveness and economic activities and help create new productive jobs, thereby helping to stimulate economic growth.

The recent spread of mobile telephony throughout the continent is unquestionably one of its greatest success stories. Africa's mobile market is, in fact, the fastest growing market in the world with an average annual growth of 50 per cent from 2000 to 2005. However, the challenges the ICT sector is facing in Africa are still huge.

The communication gap

Telecommunication infrastructure is very limited in Africa. At present, communications within the continent often have to be routed through other networks located in other continents (mainly Europe and/or North America), due to the lack of infrastructure in Africa. The quality of communications in many African countries is very poor, with the probability of a call going through successfully being very low, when compared to the developed world. The Internet penetration rate is also very low, with most of the population not having access to computers and Internet connections. At the same time, the cost of communications in African countries is still prohibitively high when compared to the developed world. As a matter of fact, the cost of a communication between two neighbouring countries is often higher than the cost of a communication between an African country and a developed country outside the continent.

Investment needs in Africa are still very significant, even though the situation has improved dramatically in recent years with the increasing involvement of the private sector as a result of African governments' commitment to opening their domestic markets to competition.

But still, the incentives for investment in ICT are often relatively weak and African governments need to establish an enabling environment (including regulatory and other aspects) to promote ICT.

In addition, while urban areas are benefiting from increasing access to ICT, most of the smaller towns and rural communities in Africa remain without any affordable access to ICT.

IDB's response in sub-Saharan Africa
IDB has been involved in the financing of many telecommunication projects in Africa. For example, two projects for Gabon Telecom have been partially financed by the bank through an instalment sale mode of financing. This is a medium to long-term mode of financing for acquiring fixed assets. Under this operation, IDB purchases the telecommunications equipment and sells it back to the beneficiary at a mark-up. The first project was approved in 1986 for an amount of USD 14.89 million. The money was used to acquire television and radio broadcasting stations, Earth stations, ground transmission and switching equipment, and telephone cables. The second project was approved in 1996

for an amount of USD 20.3 million. This was used for the replacement and installation of additional switching equipment, connections and stations. Upon completion, these two projects allowed the modernization of Gabon's telecommunication infrastructure and extended the network nationwide. Also, the projects allowed the interconnection of the three mobile operators in Gabon, which resulted in a more competitive environment and reduced communication costs.

IDB has also been involved in the financing of Telecel Gabon, Telecel Benin and Telecel Niger, subsidiaries of the Atlantic Telecom Group, a joint stock company whose main shareholder is Etisalat/UAE (United Arab Emirates). The project was approved in 2003 for a total amount of EUR 49.45 million through a leasing mode of financing, which is a medium to long-term mode of financing for rental (with a mark-up) of fixed assets. At the end of the rental period, ownership of the assets is transferred to the lessee. The project's aim was to consolidate and expand the existing 900 MHz mobile network in those three countries. It has allowed the private operators to strengthen their market shares, increase their coverage and provide a better service to their customers.

The IDB Group, through its affiliate the Islamic Corporation for the Development of the Private Sector (ICD), participated in 2001 in the debt financing of Thuraya, a regional satellite telecommunication company that covers a large part of the African continent. An amount of USD 10 million was provided through a leasing mode of financing. This was used to cover part of an Islamic facility of USD 100 million for the construction and lease-back of ground station assets.

Future prospects

IDB strongly believes that ICT is a key enabler for achieving meaningful development in the field of education. In this respect, IDB encourages and supports the sharing, collaboration and dissemination of good practice and experience relating to the use of ICT in education. IDB has financed pilot projects in Mauritania and Sudan to introduce the use of ICT in illiteracy eradication, through an innovative concept called "Technological Literacy Centres". This new concept aims at stimulating the development of new electronic learning tools and services and creating awareness among the targeted communities. It could be extended to other African member countries.

The bank is also exploring the possibility of disseminating ICT in poor rural communities in its member countries. Based on its "2020 Vision" concept, IDB is actively embarking on the establishment of telecentres in its member countries to offer, among other services, access to informational content, e-learning tools, trading opportunities, e-health and banking services. Microfinance could also be used by poor rural populations to acquire ICT equipment, such as mobile phones. This will enable people to undertake more productive income-generating activities and, therefore, contribute to stimulating the economic growth of these poor areas.

Satellite-based communications are becoming increasingly popular in Africa. Satellite technology addresses the infrastructure problem in an elegant way, since a relatively low investment is needed to implement the ground segment of a system when compared to the cost of extending an existing PSTN (public switched telephone network) and/or GSM (Global System for Mobile communications) network. IDB believes in regional satellite solutions such as the proposed RASCOM project, which aims to launch and operate the first satellite dedicated to covering the African continent and provide rural populations with affordable access to ICT. ■

Abdoulie Janneh

*Under-Secretary-General and Executive Secretary,
United Nations Economic Commission for Africa
(ECA)*

ECA

Africa must connect!

Connecting Africa through effective use of information and communication technologies (ICT) has never been more urgent than it is now. The imperatives for connectivity are premised on several factors.

The first is that Africa needs to catch up with the rest of the world with respect to its information and communication infrastructure. Africa trails the rest of the world, in terms of the extent and quality of ICT infrastructure. In Africa, making an international phone call or accessing the Internet through high-speed networks is extremely costly, for the simple reason that countries are not connected to the global optical-fibre broadband infrastructure. This limitation, as a result, severely reduces access by ordinary Africans.

Another factor is that a lot of economic growth and opportunities will be created and sustained through the existence of sound, solid infrastructure. For instance, with viable and effective infrastructure, many countries can be part of business process outsourcing, estimated at USD 642 billion annually and expected to grow. This also includes call centres and other services that depend on information technology.

Furthermore, the distribution of telephony and Internet services is biased in favour of urban areas in most African countries, accounting for over 80 per cent of the services.

In rural areas, where over 80 per cent of the population resides, people have access to a paltry 20 per cent of the services. Therefore, urgent interventions are required to bring about equitable distribution of ICT infrastructure in every African country.

ITU and ECA recognized that the improvement of connectivity was one of the key development challenges facing Africa when, in 1963, the two institutions signed a memorandum of understating to coordinate efforts in accelerating the development of telecommunications on the continent.

Infrastructure development and investment opportunities

Although the basic infrastructure to connect to the global information network exists in some African countries, affordable and equitable access remains a critical issue for economic empowerment and attracting foreign direct investment. Network roll-out is often not coordinated with other strategic infrastructure development initiatives, thus reducing the intended benefits. Adoption and diffusion of ICT is also hampered by lack of access to other amenities, such as reliable sources of electricity. Remote areas, and in some cases urban areas too, are characterized by irregular or non-existent electricity supplies.

Fotosearch
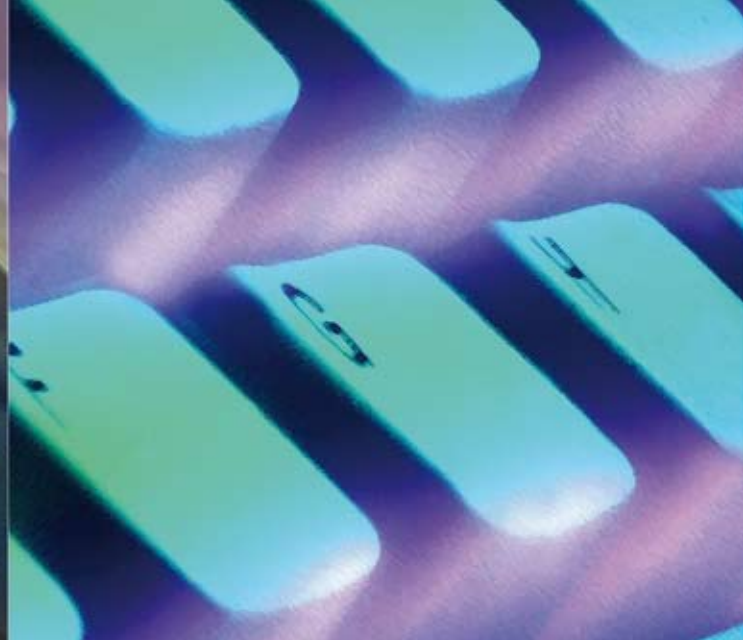
The good news is that many African governments have pri-oritized the development of ICT infrastructure and activities are being undertaken in over 20 countries surveyed recently by ECA. These activities include:

» Laying of fibre-optic cables to build national ICT infra-structure backbones, expand fixed networks, and pro-vide transport infrastructure for data communications;

» Expansion of the mobile network to under-serviced areas;

» Power/energy supply projects;

» Improvement of rural services through the creation of universal service funds;

» Promotion of network expansion by private operators.

An example can be seen in Uganda, where the government has recognized the role of ICT in national development and in transformation programmes. In the budget for the year 2007–2008, one of the priority areas, which will have the first call on all new resources, includes ICT, alongside science, technology and industrial development. The full liberalization of the telecommunications sector in Uganda has led to more investors and the government has begun building a national data transmission backbone which links districts with fibre-optic cable to enable high-speed connec-tivity for voice and data exchange. The project also includes the linking of all government ministries and agencies. In the budget for 2007–2008, the government has allocated to the project the equivalent of USD 3 million.

In Kenya, the government intends to develop and support an expanded and efficient ICT infrastructure in order to im-prove broadband connectivity whilst also providing easy access to international and national networks. This will be achieved through investment in an undersea fibre-optic ca-ble and the development of a national fibre-optic network.

The equivalent of USD 15 million has been allocated by the government in the 2007–2008 budget to *The East African Marine System* (TEAMS) project, which is due for completion in mid-2008. It is expected to provide Kenya's citizens with cheaper and faster Internet connections with the rest of the world.

Conclusion

The examples from Uganda and Kenya show that many African governments are giving priority to ICT infrastructure development as a means of stimulating economic growth and transforming other sectors of the economy. It is for this reason that in the ICT policy-making process, ECA has ensured that every national information and communication infrastructure (NICI) plan or strategy is based on the framework of the African Information Society Initiative (AISI). This offers a basis for the following issues to be considered: liberalization of ICT sectors; expansion of infrastructure and networks; establishment of regulatory agencies; creation of universal access funds; improving access for the poor, and linkages with the United Nations Millennium Development Goals.

Above all, there must be a concerted effort by all African governments to find pro-active and creative solutions for stimulating investment in ICT, including domestic funds. And they should work closely with the private sector in each country, especially in bridging the rural-urban infrastructure gap. ■

Editor's note

At a retreat for academics (organized in 2003 under the African Information Society Initiative by ECA jointly with the Ford Foundation) participants were privileged to hear a poem by Nigerian poet Remi Raji. His poem (reproduced on page 54 at the request of ECA) captures the dream of a connected Africa.

A Poem for Practical Dreamers

As for me, I dream the possibilities of rain in seasons of drought
I think of open spaces in enclosures of despair and doubt

I think of…
Physicists, chemists, mathe-magical wizards
of statesmen of ideas, systems workers
sowers of real estate dreams
of super highway traders, and of cool bulldozers
To you, who love problems and treasure solutions
Here's your mantra for the new age.

From Accra to Alexandria and
From Abuja to Addis Ababa, connect

From Mali to Somali, dream
From the Bight of Benin to the Mediterranean fringe of Africa, connect

From Lagos to Lilongwe, connect
From Tunis to Timbuktu, dream

From Harare to Hadejia, dream
From Niamey to Nairobi, connect

From Cape Town to Kano, connect
From Monrovia to Maputo, dream

From Dakar to Dire Dawa, dream
From Mauritania to Mauritius, connect

From Futa Djallon to the Zambezi, connect
From alluvial Nile to the Niger delta, dream

From Jos to Johannesburg, dream
From the Cape flats to the Rift valleys, connect

No more famished roads rigged with bombs of ignorance
But new roadmaps, new desires to soar in knowledge
And in place of borders and boundaries, new bridges
Not digital divide, but digital dividend in search of drivers
No more the fibre optics of conflicts all over the land
No more desperate quivers in our history of quicksand.

From Cairo to Kampala, connect
Over mountains, swamps and savannahs
let these dreams flower into a million inventions
and let the Browser Bug byte us into a new age.

One day soon, our vision shall become energies
In every City, every Village and every Hamlet of the mind
Many languages. One dictionary…
Many peoples. One passion…
Multiple traditions. One heritage. One virtual country in one diverse continent.
Many buzzwords but one password to the luminous future.

Remi Raji
(to the Class of AISI/ICT4D @ Addis Ababa, 15/06/03)

Economic
Commission
for Africa

Jay Naidoo

Director and Chairman of the Board, Development Bank of Southern Africa (DBSA)

DBSA

Revolutionizing ICT in Africa

A quiet revolution is happening in Africa. Information and communication technologies (ICT) are rapidly changing people's lives by providing vital education, health and other economic services.

Innovations are making sure that once marginalized communities are becoming part of the information age, whether they are nomadic shepherds in Algeria or township youths in South Africa.

But, despite tremendous growth in the sector, we on this continent lag far behind the rest of the world. African countries recorded the highest growth rates for mobile phone use – ranging from 50 to 400 per cent over the last three years – but remain at the bottom of the pile when it comes to fixed-line telephones and Internet access. Barely 5 per cent of households have fixed-line telephones and less than 4 per cent of Africans have Internet access, compared to a world average of 17 per cent.

Given the crucial role telecommunications play in economic growth and development, the need to expand these services is vital. Indeed, we need to create conditions for a rapid transformation and revolution of the sector if we are to meet the United Nations Millennium Development Goals and others we have set for ourselves.

I understand that this is easier said than done, and that it is up to us as leaders in ICT to lobby and agitate for the necessary commitments from our governments and the private sector. We are dealing with many complexities and, without doubt, progress will not be uniform across this vast continent.

But, in my view, we can start taking the essential steps towards achieving the universal access we aim for, by putting in place simple, yet effective measures.

These should include:

» A more proactive approach from both the public and private sectors in creating the conditions necessary for greater and more extensive investment in ICT. Barriers to ownership currently prevent over two billion people worldwide from connecting to mobile networks. Given the vast and diverse terrain, political conditions and access to skills and other resources, rapid action must be taken if African countries are to reach a par with the rest of the world.

» We who have the understanding and resources at our disposal must lobby harder for a greater transformation, both in attitude and policies. Our mantra should be that ICT can save lives, whether through healthcare information, for example, or alerts for natural disasters.

» Hold governments firmly to the commitments they have already made. We have the necessary partnerships and agreements at the global level. Making them work at the local level is now our challenge.

» Encourage greater deregulation and competition in the sector. There is ample proof that investment in ICT infrastructure provides a great return on investment. Governments must provide the policy framework and create the right conditions for more public-private partnerships. Our governments must understand that there is value in allowing competition in the telecommunication marketplace. Fair competition in a properly regulated environment will offer access to more people who urgently require ICT services.

» Learn from the best practice that already exists. The GSM Association, and a host of other local and regional organizations, have done sterling work in developing countries on the use of ICT in promoting entrepreneurship, providing education and health services, and in promoting more sustainable use of the environment and other natural resources. The pilot projects carried out in Asia and Africa provide convincing examples of how the innovative use of mobile phones and the Internet can help change peoples' lives for the better.

Sony Ericsson

» Investment in ICT must be made for good business and social development reasons, as charity is not required. Studies have shown that poor people are more than willing to pay for access to data through mobile and Internet services, especially if the alternative requires long and expensive travel. We must see that investment in serving consumers "at the bottom of the pyramid" is a sound business decision which is likely to yield results.

» People are thirsty for useful knowledge and it is important to expand e-services as well as simple Internet access. Research by a variety of institutions has shown that the most popular services accessed include job information, e-government, telemedicine, news, entertainment and school or university results.

As leaders on this continent, we are all well aware of how ICT can be a catalyst in achieving higher economic growth rates, attaining development targets and, most importantly, contributing to the reintegration of Africa into the world economy. It is, therefore, our duty to use our energies and resources to work towards finding solutions that will help African countries achieve the World Summit on the Information Society (WSIS) target of connecting all towns and villages by the 2015 deadline.

Africa is the last untapped market in terms of ICT services. We are open for business and are doing our utmost to ensure that returns on investments are profound, both financially and in terms of changing lives. Now is the time for delivering on our promises of closing the digital divide. We have a unique opportunity as modern technologies make connectivity affordable and as demand drives private investment. Now is the time for the ICT sector to assist African countries to leap forward into the 21st century. ◼

Louis Michel

European Commissioner for Development and Humanitarian Aid

Connecting Europe and Africa – bridging the digital divide

Africa has shown an impressive economic performance in recent years, with an annual economic growth rate in excess of 5 per cent. But, despite this success, Africa continues to be marginalized in the international economy. In an increasingly globalized world, Africa accounts for only about 2 per cent of world trade and its share of global manufactured exports is almost negligible. Without increased economic growth and private investment, few African countries will have the sustainable revenues they need to deliver basic social services such as education and health care.

Action by the European Union (EU) is geared towards stimulating rapid, broad-based and sustainable economic growth in order to contribute to an effective reduction of poverty. We support African efforts to achieve macroeconomic stability, the creation of regional markets and an appropriate private investment climate. But limited access to transport and communication services constrains economic growth. These limitations, together with the missing links in cross-border connections, mean that production and commerce often become uncompetitive.

The EU has taken two main measures to help boost and diversify production in Africa, through involving the private sector, and to ensure that the necessary infrastructure and networks are available.

EU-African Business Forum

The European Commission recently launched a joint dialogue platform with the African Union Commission to discuss with business what is needed to develop the private sector. The 1st EU-African Business Forum in Brussels, Belgium, in November 2006, concluded that a closer dialogue with business will be an invaluable asset in development policy and will bring concrete results for Africa. The 2nd EU-African Business Forum, held in Accra, Ghana, in June 2007, drew up an action plan for the private sector, focused on fostering investment, boosting industry and creating jobs. In the area of information and communication technologies (ICT), it called for a programme of institutional capacity building, for more funding for ICT, and for the expansion of ICT in rural areas of Africa. It also encouraged the implementation of the "e-Schools project" of the New Partnership for Africa's Development (NEPAD), which aims to provide more computers for schoolchildren across Africa and foster their skills.

EU-Africa Partnership for Infrastructure

The EU and the African Union have also launched an EU–Africa Partnership for Infrastructure, the aim of which is to promote regional integration by supporting networks that facilitate interconnectivity at continental level. The interests of the partnership range from transport to the latest telecommunication networks. African ownership will be en-

Fotosearch

sured through close engagement with African institutions in accelerating implementation of the African Union-NEPAD infrastructure Action Plan, which has identified key projects and missing links in trans-African networks.

The EU-Africa Partnership will use a series of financing instruments, such as the usual national and regional development programmes. However, in addition, we have also created an EU Trust Fund for Infrastructure in Africa, together with the European Investment Bank (EIB) and nine EU Member States. It has EUR 87 million in grants and about EUR 260 million in loans for the start-up phase until the end of 2007. The Trust Fund will finance cross-border projects, or national projects with a demonstrable regional impact.

Fitting in with the *Connect Africa* initiative?

How do these two EU programmes relate to the *Connect Africa* initiative? Firstly, the missing links in trans-African networks must be identified and prioritized so that targeted programmes can be established.

Secondly, appropriate regulatory frameworks need to be harmonized in order to create a sound business environment for innovation, growth and social inclusion. In this context, the European Commission has already supported ITU in establishing a West African regulatory framework for

telecommunications, which is being adopted at national level. A further EUR 6 million have been earmarked to extend this framework to the rest of Africa and, by so doing, achieve a unified set of regulations on the African continent. This is important because it will lower the barriers to entry for telecommunication operators, and so the supply of services will increase and consumers will have more choice.

Thirdly, the nascent EU Infrastructure Trust Fund has already made investments in the African telecommunication scene. It has agreed, for instance, to provide EUR 18 million as part finance of the "EASSy" project, which is a submarine telecommunications cable connecting countries on the coast of East Africa.

Finally, we should not forget that investment in ICT can lead to major advances in reaching the United Nations Millennium Development Goals, notably in education and health. Therefore, the European Commission has decided to support increased use of ICT in these sectors in Africa during the period 2008–2013.

In short, my objective, and the goal of the European Commission in pursuing these measures, is to help bridge the digital divide in all corners of Africa and to integrate the African economy into the global market. ■

A SNAPSHOT OF ICT IN AFRICA

A snapshot of progress

The latest edition of the ITU report *Trends in Telecommunication Reform: The Road to Next-Generation Networks*, released in September 2007, gives an overall picture of how more and more people around the world are being connected to information and communication technologies (ICT). It says that by the end of 2006, there was a worldwide total of nearly 4 billion mobile and fixed-line telephone subscribers, plus over 1 billion Internet users.

In Africa, very few people have access to the Internet. But the mobile boom has resulted in an increasing number having access to telephony (see table on page 69), which can lead to Internet access and many other services.

Harnessing mobiles to access the Internet
In Nigeria, the number of mobile subscribers had reached over 32 million at the end of 2006. At current rates of growth, Nigeria is expected to overtake South Africa during 2007 to become the continent's largest mobile market.

The spectacular growth of mobile services in developing countries has been fuelled by declining tariffs, prepaid packages, cheaper handset prices, increased network coverage and new service options, such as mobility and the short message service (SMS). The same factors could promote wireless broadband Internet access. In Kenya, for example, one Internet service provider (ISP) has announced that it will provide Internet access, including instant messaging and e-mail, through a handheld device. And in Zambia, a mobile operator is introducing the country's first mobile Internet access facility.

Still, because of high prices, these services remain beyond the reach of most customers in developing countries and are targeted at high-end residential and business customers. It is hoped that operators will eventually find pricing plans that make these services more affordable.

Mobile broadband
At the end of 2006, around 109 countries worldwide had commercial IMT-2000 networks, also known as third-generation, or 3G mobile (see Figure 1 on page 62). Asian markets were the earliest adopters of IMT-2000, followed by Europe and North America.

In Africa, Zambia launched commercial 3G services in 2006. Nigeria has taken a technology-neutral approach under which those offering CDMA 1x WLL with limited mobility can also provide 3G services. In Sudan, national provider Canar Telecommunications Company has announced the commercial launch of the country's first 3G wireless broadband Internet service.

Figure 1 – Mobile technologies worldwide, May 2007
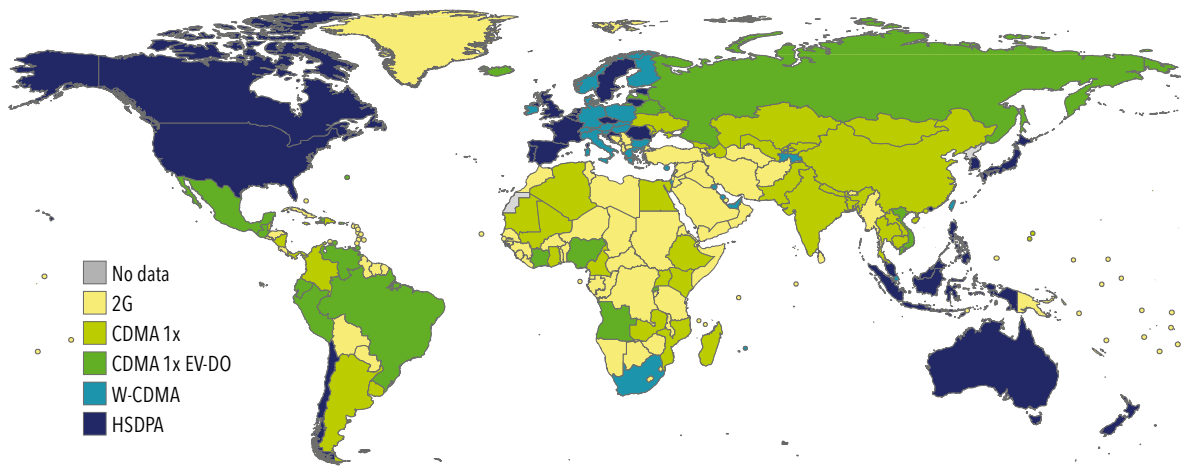
Note – For some countries where more than one technology has been commercially deployed, the most advanced technology is represented.

2G	Second-generation wireless telephone technology
CDMA2000 1x	Code division multiple access
CDMA2000 1x EV-DO	Code division multiple access evolution-data optimized
W-CDMA	Wideband code division multiple access
HSDPA	High-speed downlink packet access

Disclaimer: The designations employed and the presentation of material in this map do not imply any opinion whatsoever on the part of the ITU concerning the legal or other status of any country, territory or area or any endorsement or acceptance of any boundary.

Source: Adapted from the ITU World Telecommunication/ICT Indicators and 3Gtoday.

The demand for affordable IMT-2000 services is rising in developing countries. They could help to meet it through the commercialization of low-frequency mobile technologies. These enable wider coverage with fewer base stations, and so reduce the cost of mobile infrastructure. CDMA450 is a 3G solution combining next-generation CDMA2000 wireless communication services with network coverage using the 450 MHz frequency band. Its wide adoption throughout the developing world is indicative of the benefits it can bring in low-cost connectivity. In Benin and Libya, services licensed in the 450 MHz frequency are used for delivering mobile or fixed wireless access to remote and rural areas.

Mobile financial services

Despite the lack of standardization, the ability to make payments via a mobile phone has developed as a highly successful model, especially for developing countries. Financial services allowing mobile subscribers to send cash with a simple SMS have emerged as a way of bringing people without bank accounts into the world of financial transfers.

In Kenya, for example, *M-pesa*, or "mobile money", has enabled the subscribers of Safaricom to make money transfers, with charges at less than a third of traditional banking services. Vodafone, which holds a 35 per cent share in Safaricom,

has entered into a partnership with Citigroup that will soon allow Kenyans in the United Kingdom to send money home via SMS.

VoIP

The number of voice over Internet protocol (VoIP) and voice over broadband (VoB) subscribers continues to grow around the world, fuelled by the demand for cheaper services. In addition, VoIP is being integrated into new services offered on IP networks, such as instant messaging and data exchange. But VoIP also threatens the revenues of traditional incumbent operators, and until recently, it was banned in many African countries. However, a number of countries have now legalized VoIP, including Algeria, Kenya, Mauritius, Somalia, South Africa, Tanzania and Uganda. Also, Egypt, Ghana and Nigeria are about to legalize the technology. Some countries are taking a more cautious approach, authorizing VoIP only for incumbents.

WiMAX

New wireless technologies, such as WiMAX, offer leapfrogging opportunities to developing countries, and promise cheaper broadband services. More than 200 operators worldwide are preparing to deploy WiMAX or have begun WiMAX trials.

Alamy

A number of operators in Africa already provide the technology, and WiMAX networks are being deployed in the 3.3–3.8 GHz range of spectrum in Algeria, Morocco, Mozambique, Namibia, Nigeria, Kenya, South Africa and Uganda. In South Africa, Telkom began trials of WiMAX in Pretoria in 2005. In April 2007, *Algérie Telecom* in Algeria signed an agreement with Galaxia for the deployment of a WiMAX network. In Morocco, *Meditel* and *Maroc Connect* acquired WiMAX licences in 2005 through a public tender and started trials and roll-out of their networks in 2006. Also, in 2006, the Tunisian Government authorized *Tunisie Telecom* and *Divona Telecom* to roll out WiMAX networks, and these are being tested in Tunis and Sfax for corporate clients.

Fibre-optic connectivity
The deployment of international fibre-optic networks, together with national fibre-optic backbones, is increasingly viewed as a main policy objective for developing countries. In Africa, the SAT-3/WASC high-capacity fibre-optic cable connects Senegal, Côte d'Ivoire, Ghana, Benin, Nigeria, Cameroon, Gabon, Angola and South Africa. New undersea fibre-optic cable projects include the East African Submarine Cable System (EASSy). Both Egypt and Kenya have announced plans to attract competing providers of undersea fibre-optic cables, so as to further lower the costs of international Internet access.

Numerous terrestrial fibre-optic projects have also been launched. For example, the Trans-Kalahari fibre-optic project in Botswana is expected to be operational in 2008. It is being implemented by the national incumbent, Botswana Telecommunications Corporation (BTC), and will deploy around 2000 km of optical fibre, connecting Botswana with Namibia and Zambia. The project is part of a wider initiative to liberalize Botswana's ICT sector, including the opening of its international gateway to competition and the introduction of VoIP services.

Internet exchange points (IXP)
Due to the lack of international connectivity, African countries are often dependent on overseas carriers for the exchange of traffic between African ISPs. Consequently, African Internet users pay a higher price for their connectivity. Establishing regional IXPs reduces interconnection costs, as well as latency. Governments, regulators and policy-makers can incorporate IXPs into their ICT development strategies as a way of using their international bandwidth economically.

By 2007, eighteen African countries had created a national IXP and two regional IXPs existed – one in Cairo and another serving Kenya, Tanzania and Uganda. Four of the national IXPs are in least developed countries: Angola, Rwanda, Tanzania and Zambia. The African Internet Service Provider Association (AfrISPA) plans to open IXPs in a further 11 African countries, including Benin, Cameroon, Central African Republic, Republic of the Congo, Côte d'Ivoire, Gambia, Malawi, Mali and Senegal.

Opening the international gateway to competition can also reduce Internet costs, as can the liberalization of very small aperture terminal (VSAT) markets. Such measures have been taken in Kenya and South Africa. In Nigeria, the government actively supports the establishment of IXPs around the country and the Nigerian Communications Commission has approved a proposal to fund the creation of IXPs on a not-for-profit basis in collaboration with the ISP industry under the umbrella of Internet Service Providers Association of Nigeria (ISPAN).

Privatization and competition

Many countries have found that competition is more fair when the State avoids being both a market player (as owner or part-owner of the incumbent) and a referee at the same time. By mid-2007, around 123 ITU Member States had a private or privatized national fixed-line incumbent, and several more countries have announced their intent to do so (see Figure 2). This trend is also being followed in Africa, where some 55 per cent of countries had at least partially privatized.

Figure 2 – Privatizations of fixed-line incumbents, 2007
Total number of countries: 123

- Europe and the Commonwealth of Independent States (CIS)
- Africa
- Americas
- Asia-Pacific
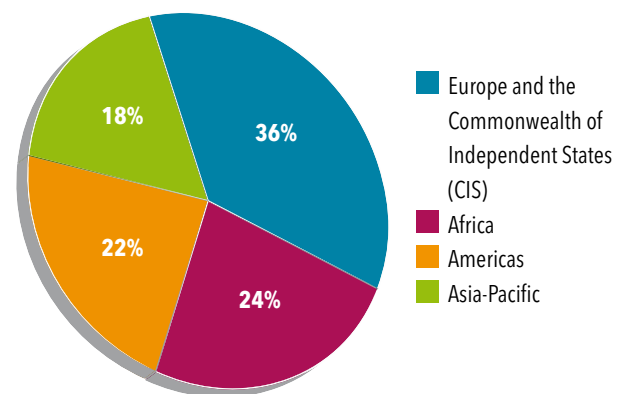
Source: ITU World Telecommunication Regulatory Database.

Botswana, for instance, is moving ahead with plans to privatize BTC. The Botswana Telecommunications Authority recently awarded BTC a service-neutral licence, which will allow it to provide mobile services. The evaluation of bidders for the transaction advisor for BTC has been completed. The next step is to identify potential strategic equity partners, with the aim of completing the transaction within a year. Kenya is also on course in the privatization of Telkom Kenya, and a Preliminary Information Memorandum was issued in March 2007 to provide information to potential investors.

Effective competition leads to lower prices, more choice and better quality of service for consumers. It can also facilitate the take-up of new services. National regulatory authorities have an important role to play in ensuring and maintaining a competitive marketplace. In Malawi, for example, the Malawi Communications Regulatory Authority recently issued a licence to Access Communications Limited as the country's second national operator to provide fixed public telecommunication services in competition with the recently privatized incumbent Malawi Telecommunications Ltd. In Namibia, the government licensed a second mobile operator in early 2007.

Regulators grow in number
Over 77 per cent of ITU Member States have established a separate regulator. Forty-five African economies (or 83 per cent) have established a Telecommunication/ICT Regulatory Authority, with sixteen created since 2000 (see Figure 3). Already, there are several examples of effective regulatory bodies in Africa. Increasingly, regulators seek to be enablers of ICT development and agents of change. Providing them with the tools and powers to do their job effectively increases opportunities for attracting investment and innovation, and for building confidence in the market.
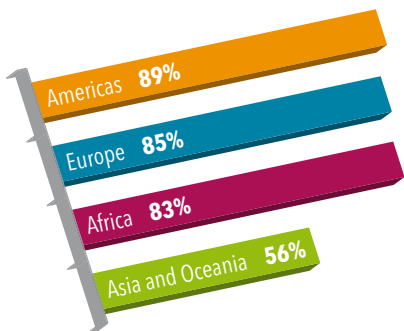
International mobile roaming
The issue of mobile roaming charges is on the agenda of regulators worldwide, in an attempt to reduce the prices paid by consumers using their mobile phones abroad. Several operators in Africa have taken measures to cut these charges. In 2006, for example, mobile operators in Kenya, Tanzania and Uganda began offering customers seamless roaming within the three countries at domestic local rates. Celtel in Kenya paved the way with its "One Network," and extended its offer to the Democratic Republic of Congo, Gabon and the Republic of Congo.

Alamy

Figure 3 — Separate regulators, by region, September 2007

Regulatory authorities, by region, 2007 — Total: 148 regulators

- Asia-Pacific
- Europe
- Africa
- Americas
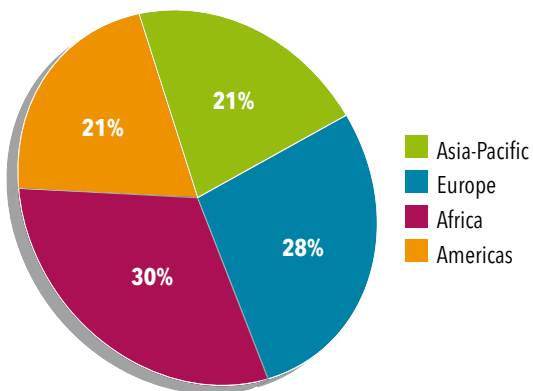
Countries having established regulatory authorities, by region, 2007

Americas **89%**
Europe **85%**
Africa **83%**
Asia and Oceania **56%**

Source: ITU World Telecommunication Regulatory Database.

The 15 members of the Economic Community of West African States (ECOWAS) have agreed that regulatory authorities should consult mobile operators to arrive at reasonable tariffs. Meanwhile, most mobile phone users in Africa simply purchase a new SIM card when they cross borders to avoid paying high mobile rates.

Sharing infrastructure and spectrum

A balance must be struck between improving access to networks and encouraging investment in infrastructure. In countries where regulators have adopted local-loop unbundling, incumbent and other major operators must provide competitors with access to the unbundled local loop.

In developing countries, the focus is on infrastructure sharing. In Africa, this is central to the debate on regional connectivity and is being discussed particularly in the context of regional cable and satellite initiatives. Meanwhile, in West Africa local-loop unbundling and co-location will become mandatory for dominant operators in all Member States of ECOWAS. In addition, infrastructure sharing will be encouraged.

UNESCO

As many of the key assignments of the radio-frequency spectrum have already been made to incumbent operators for the provision of fixed, fixed-mobile, and mobile services, policy-makers and regulators have to ensure that legacy assignments do not hamper the introduction of new NGN operators and services. This can be done through such means as spectrum sharing.

In South Africa, numerous new players are seeking to offer WiMAX services on a national scale. Other licensed operators require access to the 800 MHz band for the deployment of non-broadcasting services. The regulator, ICASA, launched a public process to assess the viability of such sharing, and found that it is feasible.

Licensing

In recent years, the trend has been to move away from specific licences to those that are neutral as regards technology and service. This means that operators can offer any service, using any technology, without the need for separate licences. Uganda, for example, implemented a technology-neutral licensing regime in January 2007. Many governments are shifting to a unified authorization system, including Nigeria and Tanzania. In 2005, Morocco issued technology-neutral, unified licences, and Botswana awarded the first service-neutral licence to BTC in March 2007. ■

	Population	Main telephone lines		Mobile subscribers		Internet users	
	000s	000s	per 100 people	000s	per 100 people	000s	per 100 people
Algeria	33'354	2'841.3	8.52	20'998.0	62.95	2'460.0	7.38
Egypt	75'437	10'807.7	14.33	18'001.1	23.86	6'000.0	7.95
Libya	5'968	483.0	8.09	3'927.6	65.81	232.0	3.96
Morocco	30'735	1'266.1	4.12	16'004.7	52.07	6'100.0	19.85
Tunisia	10'210	1'268.5	12.42	7'339.1	71.88	1'294.9	12.68
North Africa	155'704	16'666.6	10.70	66'270.5	42.56	16'086.9	10.34
South Africa	47'594	4'729.0	9.97	39'662.0	83.33	5'100.0	10.75
South Africa	47'594	4'729.0	9.97	39'662.0	83.33	5'100.0	10.75
Angola	15'802	98.2	0.62	2'264.2	14.33	85.0	0.55
Benin	8'703	77.3	0.89	1'056	12.13	700.0	8.04
Botswana	1'760	136.9	7.78	979.8	55.68	60.0	3.40
Burkina Faso	13'634	94.8	0.70	1'016.6	7.46	80.0	0.59
Burundi	7'834	31.1	0.41	153.0	2.03	60.0	0.77
Cameroon	16'601	100.3	0.61	2'252.5	13.80	370.0	2.23
Cape Verde	519	71.6	13.80	108.9	20.99	29.0	6.09
Central African Rep.	4'093	10.0	0.25	100.0	2.48	13.0	0.32
Chad	10'032	13.0	0.13	466.1	4.65	60.0	0.60
Comoros	819	16.9	2.12	16.1	2.01	21.0	2.56
Congo	4'117	15.9	0.40	490.0	12.25	70.0	1.70
Côte d'Ivoire	18'454	260.9	1.41	4'065.4	22.03	300.0	1.63
D.R. Congo	59'320	9.7	0.02	4'415	7.44	180.0	0.30
Djibouti	807	10.8	1.56	44.1	6.37	11.0	1.36
Equatorial Guinea	515	10.0	1.99	96.9	19.26	8.0	1.55
Eritrea	4'560	37.5	0.82	62.0	1.36	100.0	2.19
Ethiopia	79'289	725.1	0.91	866.70	1.09	164.0	0.21
Gabon	1'406	36.5	2.59	764.7	54.39	81.0	5.76
Gambia	1'556	52.9	3.40	404.3	25.99	58.0	3.82
Ghana	22'556	356.4	1.58	5'207.2	23.09	609.8	2.70
Guinea	9'603	26.3	0.33	189.0	2.36	50.0	0.52
Guinea-Bissau	1'634	10.2	0.76	95.0	7.10	37.0	2.26
Kenya	35'106	293.4	0.84	6'484.8	18.47	2'770.3	7.89
Lesotho	1'791	48.0	2.67	249.8	13.92	51.5	2.87
Liberia	3'356	6.9	0.21	160.0	4.87	…	…
Madagascar	19'105	129.8	0.68	1'045.9	5.47	110.0	0.58
Malawi	13'166	102.7	0.80	429.3	3.33	59.7	0.45
Mali	13'918	82.5	0.59	1'513.0	10.87	70.0	0.50
Mauritania	3'158	34.9	1.10	1'060.1	33.57	100.0	3.17
Mauritius	1'256	357.3	28.45	722.4	61.50	300	24.10
Mozambique	20'158	67.0	0.33	2'339.3	11.60	178.0	0.90
Namibia	2'052	138.9	6.84	495.0	24.37	80.6	3.97
Niger	14'426	24.0	0.17	323.9	2.32	40.0	0.28
Nigeria	134'375	1'688.0	1.26	32'322.2	24.05	8'000.0	5.95
Rwanda	9'230	16.5	0.18	314.0	3.40	65.0	0.70
S. Tomé and Principe	160	7.6	4.74	18.0	11.51	29.0	18.11
Senegal	11'936	282.6	2.37	2'982.6	24.99	650.0	5.45
Seychelles	81	20.7	25.44	70.3	86.52	29.0	35.67
Sierra Leone	5'678	24.0	0.49	113.2	2.21	10.0	0.19
Somalia	8'496	100.0	1.22	500.0	6.08	94.0	1.11
Sudan	36'993	636.9	1.72	4'683.1	12.66	3'500.0	9.46
Swaziland	1'029	44.0	4.27	250.0	24.29	41.6	4.02
Tanzania	39'025	157.3	0.40	5'767.0	14.78	384.3	1.00
Togo	6'306	82.1	1.30	708.0	11.23	320.0	5.07
Uganda	29'856	108.1	0.36	2008.8	6.73	750.0	2.51
Zambia	11'861	93.4	0.79	1'663.0	14.02	500.0	4.22
Zimbabwe	13'085	331.7	2.54	832.5	6.36	1'220.0	9.32
Sub-Saharan Africa	719'220	7'080.4	0.99	92'220.0	12.90	22'499.7	3.16
Africa total	922'510	28'475.9	3.10	198'153.0	21.58	43'686.7	4.77

THE ITU MISSION…

ITU/J.M. Ferré

The ITU leadership team
Left to right: Sami Al Basheer Al Morshid, Director of the Telecommunication Development Bureau; Houlin Zhao, Deputy Secretary-General; Hamadoun I. Touré,
Secretary-General; Valery Timofeev, Director of the Radiocommunication Bureau; Malcolm Johnson, Director of the Telecommunication Standardization Bureau

…Bringing the benefits of ICT to all

ITU's mission is to enable the growth and sustained development of telecommunications and information networks. The aim is to help people everywhere to participate in, and benefit from, the emerging information society and global economy. ITU assists in mobilizing the technical, financial and human resources needed to make this vision a reality.

A key priority is to bridge the digital divide by promoting the building of information and communication infrastructure, the establishment of sound policy and regulatory environments, and the training of personnel. Another crucial task of ITU is to help build confidence in the use of information and communication technologies through enhanced online security — one of the most critical concerns of the information age. In this regard, ITU is taking concrete measures through its Global Cybersecurity Agenda. ITU also puts priority on strengthening emergency communications for disaster prevention and relief, especially in developing countries that often suffer most.

From the beginning, ITU has had the task of ensuring the equitable management of vital natural resources — the radio-frequency spectrum and satellite orbits — to help bring wireless services to every corner of the world. It is also a unique venue at which standards are developed for infrastructure and equipment worldwide. And it provides support to countries as they pursue their telecommunication development strategies. Every element of ITU's work has the same goal: helping the world to communicate.

MAKE THE RIGHT CONNECTIONS

ITU TELECOM AFRICA 2008
Cairo
12-15 May

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