

African Internet Status

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The Internet has grown rapidly on the continent over the last few years. At the end of 1996 only 11 countries had Internet access, but by November this year all 54 countries and territories had achieved permanent connectivity and the presence of local full service dialup ISPs.

Despite the rapid growth of Internet access in Africa it has been largely confined to the capital cities, although [a growing number of countries](#) do have points of presence (POPs) in some of the secondary towns, and in South Africa POPs are in about 100 cities and towns. In some countries the national telecom operators have made a special policy to provide local call Internet access across the whole country. To do this, the operator establishes a special 'area-code' for Internet access that is charged at local call tariffs, allowing Internet providers to immediately roll out a network with national coverage. With the massively reduced costs for those in remote areas that this provides, it is surprising that so far only 16 of the 53 countries have adopted this strategy - Benin, Burkina Faso, Cap Vert, Ethiopia, Gabon, Malawi, Mali, Mauritius, Mauritania, Morocco, Senegal, South Africa, Tchad, Togo, Tunisia, and Zimbabwe.

The total number of computers permanently connected to the Internet in Africa (excluding South Africa) finally broke the 10 000 mark at the beginning of 1999 and in Jan 2000 it stood at almost 12 000, an increase of 20% as measured by [Network Wizards](#). The figure may actually be closer to 25 000 to 30 000 due to the measurement technique which cannot count hosts which are not referenced in domain name servers and those that are registered under the generic TLDs - .com, .net, .org. Nevertheless this still means Africa has about as many hosts on the Internet as a small Eastern European country such as Latvia, which only has a population of 2.5 million (compared to the 780m people in Africa's as estimated by Unicef 1998, about 13% of the total world population).

The recent opening up of the Nigerian Internet market is beginning to change this picture as the telecom regulator has licensed 38 ISPs to sell services and about 12 are currently active. With a fifth of Sub Sahara's population, Nigeria has been one of the slumbering giants of the African Internet world which until mid '98 only had a few dialup email providers and a couple of full ISPs operating on very low bandwidth links - few were able to afford the \$130 000 a year for an international 9.6Kbps leased line. Nitel has now established a POP in Lagos with a 2MB link to Global One in the US and has put POPs in 4 other cities..

It is difficult to measure actual numbers of Internet users, but figures for the number of dialup subscriber accounts to ISPs are more readily available, for which it is estimated that there are now over 1 000 000 subscribers in Africa. Of these, North Africa is responsible for about 200 000 and South Africa for 650 000, leaving about 150 000 for the remaining 50 African countries. But each computer with an Internet or email connection supports an average of three users, a recent study by the UN Economic Commission for Africa (ECA) has found. This puts current estimates of the number of African Internet users at somewhere around 3 million in total, with about 1 million outside of South Africa. This works out at about one Internet user for every 250 people, compared to a world average of about one user for every 35 people, and a North American and European average of about one in every 3 people. (The [UNDP World Development Report](#) figures for other developing regions in '99 are: 1 in 125 for Latin America and the Caribbean, 1 in 200 for South East Asia & the Pacific, 1 in 250 for East Asia, 1 in 500 for the Arab States and 1 in 2500 for South Asia). No studies have been made in Africa of the number of rural vs urban users, but it is safe to say that users in the cities and towns vastly outnumber rural users. (See [Tables and Graphics](#) for country comparisons).

There are now about 28 countries with 1000 or more dialup subscribers, but only about 11 countries with 5000 or more - Cote d'Ivoire, Egypt, Morocco, Kenya, Ghana, Mozambique, Nigeria, South Africa, Tunisia, Uganda and Zimbabwe. Clearly a number of countries such as those in North Africa and Southern Africa have more highly developed economies and better infrastructures which would naturally result in larger populations of Internet users. Most of these countries were also among the first on the continent to obtain Internet access and so have had the most time to develop the market. There are now local Internet Society chapters in all of the African regions and in most of the countries with large Internet user populations.

Currently, the average total cost of using a local dialup Internet account for 5 hours a month in Africa is about \$50/month (usage fees, telephone time included, but not telephone line rental). Nevertheless ISP charges vary greatly - between \$10 and \$100 a month, largely reflecting the different levels of maturity of the markets, the varying tariff policies of the telecom operators, and the different national policies on private wireless data services and on access to international telecommunications bandwidth. According to the Organization for Economic Cooperation and Development, in '97, 20 hours of Internet access in the U.S. cost \$29, including

telephone charges. Although European costs were higher (\$74 in Germany, \$52 in France, \$65 in Britain, and \$53 in Italy) these figures are for 4 times the amount of access, and all of these countries have per capita incomes which are at least 10 times greater than the African average.

Most African capitals now have more than one ISP and in early 2000 there were about 450 public ISPs across the region (excluding SA, where the market has consolidated into 2 major players with 90% of the market and 40-50 small players with the remainder). Seven countries had 10 or more ISPs - Egypt, Kenya, Morocco, Nigeria, South Africa, Tanzania and Zimbabwe - while 20 countries had only one ISP. Although Ethiopia and Mauritius are the only countries where a monopoly ISP is national policy (i.e. where private companies are barred from reselling Internet services), there are other countries in which this practice still continues, predominantly in the Sahel sub-region where markets are small.

In response to the high cost of full Internet based services and the slow speed of the web, and also because of the overriding importance of electronic mail, lower-cost email-only services have been launched by many ISPs and are continuing to attract subscribers. Similarly, because of the relatively high cost of local electronic mailbox services from African ISPs, a large proportion of African email users make use of the free Web-based services such as Hotmail, Yahoo or Excite, most of which are in the US. These services can be more costly and cumbersome than using standard email software, because extra online time is needed to maintain the connection to the remote site. But they do provide the added advantages of anonymity and perhaps greater perceived stability than a local ISP who may not be in business next year.

There is also a rapidly growing interest in kiosks, cybercafes and other forms of public Internet access, such as adding PCs to community phone-shops, schools, police stations and clinics which can share the cost of equipment and access amongst a larger number of users. Many existing 'phone shops' are now adding Internet access to their services, even in remote towns where it is a long-distance call to the nearest dialup access point. In addition a growing number of hotels and business centres provide a PC with Internet access.

The rapidity with which most African public telecom operators have moved into the Internet services market is also noteworthy. In the last three years PTOs have brought Internet services on stream in 31 countries and similar moves are afoot in three others (Liberia, Somalia and Tanzania). This follows trends in the developed countries where almost all of the PTOs have established Internet services. In many Francophone countries the PTO operates the major value added service provider as a joint venture with France Cable and Radio, called Telecom-Plus in many countries and DTS in Madagascar.

In all the countries where the PTO has established the international Internet backbone, it is the sole International link provider except in Côte d'Ivoire, Nigeria, Mozambique, South Africa and Zambia where they compete with private sector international links. Usually the PTOs operate the international gateway and access to the national backbone, and leave the resale of end-user Internet access to the private sector. In a few countries the PTO also competes with the private sector in the provision of end-user dialup accounts, namely, Cameroun, South Africa and Zambia.

As far as the multinational ISPs are concerned, AfricaOnline (<http://www.africaonline.com>), is the largest operation. The group is consolidating its year of growth which saw local branches open in Namibia, Swaziland, Tanzania, Uganda and Zimbabwe, adding to its stable in Ghana, Kenya, and Côte d'Ivoire. AfricaOnline has plans to open up in additional countries over the coming months. The other three multinational ISPs which operate subsidiaries or franchises in the region are now trailing considerably with UUNET just in South Africa, Swaziland, Zimbabwe and Namibia, while Swift Global is in Kenya, and Tanzania. UUNET is recently agreed to operate AfricaOnline's Namibian network and is likely to do the same with the other AfricaOnline branches. South African ISP Mweb has recently entered the African market, purchasing ISPs in Namibia, Uganda and Zimbabwe.

Due to high international tariffs and lack of circuit capacity, obtaining sufficient international bandwidth for delivering web pages over the Internet is still a major problem in most countries. Until recently few of the countries outside of South Africa had international Internet links larger than 64Kbps, but today 24 countries have 512Kbps or more, and 15 countries have outgoing links of 1Mbps or more - Botswana, Egypt, Ghana, Kenya, Libya, Madagascar, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania and Tunisia. Excluding South Africa, the total international outgoing Internet bandwidth installed in Africa is about 60Mbps. However this means that on average about 6 dialup users must share each 1Kbps of international bandwidth, making for slow connections to remote sites.

As a result, a growing number of African Internet sites are hosted on servers that are in Europe or the U.S. This is especially necessary for countries where ISPs operate their own independent international links without local interconnections (peering), such as in Kenya and Tanzania, which means that traffic between the subscribers of two ISPs in the same city must travel to the US or Europe and back. This makes it more efficient to host outside-country, and is also being encouraged because web hosting costs can be very high, while there are even a number of free hosting sites in the US and Europe.

One response to the bandwidth problem is that incoming bandwidth is now starting to outpace outgoing

bandwidth following the increasing use of data broadcasting services which are now being installed by ISPs in Africa. These use a DirecPC-type system providing incoming bandwidth of 64Kbps for about US\$30-\$1000/month (depending on usage). The asymmetric service can deliver up to 8Mbps incoming, while the normal terrestrial phone circuit or leased line is used for all outgoing traffic. This arrangement uses a standard digital KU-Band or C-Band satellite television antenna costing \$175-\$500 (depending on size required) and a decoder card for the PC costing US\$450.

In Southern Africa the service is provided by four South African companies - Infosat (<http://www.infosat.co.za>), Siyanda (<http://www.siyanda.co.za/>), Hixsat (<http://www.hixsat.co.za/>) and GIT (<http://www.git.co.za/>). A similar service covering larger regions of Africa via different satellites is provided by Interpacket (<http://www.interpacket.net>). These systems allow ISPs to limit traffic on their expensive existing links to outgoing data only, and to use a low-cost TV satellite dish for receiving the higher volumes of incoming traffic. This can substantially reduce the operating costs for the ISPs and increases the speed of access to the web for their users.

Two-way satellite-based Internet services using very small aperture terminals (VSAT) to connect directly the US or Europe have also been quickly adopted where ever regulations allow. Namely in DR Congo, Ghana, Mozambique, Tanzania, Uganda and Zambia which all have ISPs that are not dependent on the monopoly telecom operator for their international bandwidth.

With the exception of some ISPs in Southern Africa, almost all of the international Internet circuits in Africa connect to the USA, with a few to the United Kingdom, Italy and France. However, Internet Service Providers in countries with borders shared with South Africa benefit from the low tariff policies instituted by the South African telecom operator for international links to neighbouring countries. As a result South Africa acts as a hub for some of its neighbouring countries - Lesotho, Namibia, and Swaziland.

The major international Internet suppliers are AT&T, BT, Global One/Sprint, UUNET/AlterNet, MCI, NSN, BBN, Teleglobe, Verio and France Telecom/FCR. A number of other links are provided by PanamSat and Intelsat direct to private and PTO groundstations in the US and UK, circumventing local PTO infrastructure.

Aside from the South Africa/Lesotho/Swaziland network and a link between Mauritius and Madagascar, there are no other regional backbones or links between neighbouring countries. The main reason for this is that the high international tariffs charged by telecom operators discourages Internet Service Providers from establishing multiple international links. As a result ISPs are forced to consolidate all of their traffic over a single high cost international circuit.

Roaming dialup Internet access is now a reality for travellers to most African countries courtesy of SITA, the airline co-operative, which has by far the largest network in Africa. SITA's commercial division, SCITOR (recently renamed Equant), which was formed to service the non-airline market, now operates dialup points of presence in 40 African countries. Subscribers to Internet service providers who are members of IPASS (a group of ISPs, including SITA, who share their POPs) can access their home ISPs for about \$0.22c a minute. See <http://www.ipass.com/>.

The only country in the region with an X.400 service is South Africa. Other advanced services such as ISDN and video conferencing are also generally not available on the continent - the only countries able to provide ISDN services are Egypt, Tunisia, Morocco, the Seychelles, and South Africa, (which had 35 000 subscribers in 1996).

Voice over Internet (VOIP) services are not officially available anywhere in the region, and none of the telecom operators have implemented voice over IP technology for their traffic except for Egypt Telecom which is routing some of its voice traffic to the US over IP and is expecting to trial consumer-based VOIP services shortly. Demand for most of these services is only expected to increase once there is a broader penetration of computers and data processing equipment on the sub-continent.

The American Registry for Internet Numbers (ARIN) has now taken over administration of Internet IP Address space for Africa (along with North America, South America, and the Caribbean). This means that address space is no longer free and until a local African Registry can be set up, networks will now be required to pay ARIN USD\$2500 per year to obtain a Class-C address. A proposal for an Africa Network Information Centre (NIC) has been discussed for some years only now is progress being made, partly because of the lack of on-the-ground national networking associations to support it and the political difficulties of identifying the appropriate host country and organisation to operate it.

There have been few attempts to establish email-to-fax gateways in Africa despite the apparent need, given the low penetration of the Internet. Currently the co-operative project known as the Experiment in Remote Printing (TPC) only has two African countries among the 27 in its coverage list - South Africa and Botswana. Likewise, none of the commercial services have local delivery facilities outside of South Africa.

Evidence gathered by ECA suggests the average level of Internet use in Africa is about one incoming and one outgoing email per day, averaging 3 to 4 pages, in communications which are most often with people outside

the continent. Surveys indicated that about 25 percent of the email is replacing faxes, while 10 percent are replacing phone calls and the other 65 percent are communications that would not have been made in the absence of an email system.

The highest number of users surveyed belonged to non-government organizations (NGOs), private companies and universities. The ratio of nationals to non-nationals varied between countries: 44 percent of users surveyed in Zambia were nationals as compared to 90 percent in Ghana. Most users were male: 86 percent in Ethiopia, 83 percent in Senegal, and 64 percent in Zambia. The large majority of users were well educated: 87 percent of users in Zambia and 98 percent in Ethiopia had a university degree.

A recent South African survey of the Internet found similar results: the average user was male, 26 to 30, spoke English, was high-school or university-educated, earned between US\$24,000 and US\$45,000 per year and worked in the computer industry. This indicates that the high number of users in the country is largely attributable to the previously advantaged sector of the population.

Email is used for general correspondence and document exchange, technical advice, managing projects, arranging meetings, and exchanging research ideas, although its use is still limited for accessing formal information resources. Across the continent, users report that email has increased efficiency and reduced the cost of communication but as yet it is used almost exclusively for contacting individuals in other regions. The Web is still a relatively under-utilised resource, although 40 percent of Zambian users questioned had conducted literature searches on the web.

Universities were initially at the vanguard of Internet developments in Africa and most of them provide email services, however in early 1999 only about 20 countries had universities with full Internet connectivity. Because of the limited resources and high costs of providing computer facilities and bandwidth, full Internet access at the universities where it exists is usually restricted to staff. Post graduates are often able to obtain access but the general student population usually has no access.

In the area of Internet content development, the African web-space is expanding rapidly and almost all countries have some form of local or internationally hosted web server, unofficially or officially representing the country with varying degrees of comprehensiveness. However, there are still generally few institutions that are using the Web to deliver significant quantities of information. While increasing numbers of organisations have a Web site with basic descriptive and contact information, many are hosted by international development agency sites, and very few actually use the Web for their activities. This is partly explained by the limited number of local people that have access to the Internet (and thus the limited importance of a web presence to the institution), the limited skills available for digitising and coding pages, and also by the high costs of local web hosting services.

It can be observed that the French speaking countries have a far higher profile on the Web and greater institutional connectivity than the non-French speaking countries. This is largely due to the strong assistance provided by the various Francophone support agencies, and the Canadian and French governments, which are concerned about the dominance of English on the Internet. ACCT's BIEF and AUPELF-UREF/REFER's Syfed Centres, which are building Web sites of local information as well as providing access, are the two dominant content developers in this respect.

Although there are a few notable official general government web sites, such as those of Angola, Egypt, Gabon, Mauritius, Morocco, Mozambique, Senegal, Togo, Tunisia and Zambia, there is as yet no discernible government use of the Internet for existing administrative purposes. Web presence is higher in some sectors, particularly those involved in tourism and foreign investment, and these often have more mature sites, aimed at developing an international market presence. While most ministries and national research centres may have access to electronic mail, very few have a web site. Reflecting the limited resources of the public sector, the ECA survey found that government employees made up only one percent of users in Ethiopia and only six percent in Zambia.

As far as regional intergovernmental agencies are concerned, so far [ACMAD](#), [ADB](#), [CEDEAO](#), [COMESA](#), [ECA](#), [IGAD](#) and [SADC](#) have built web sites with a substantial amount of information on their activities and their member states.

There are about 140 electronic mailing lists and UseNet newsgroups on the Internet which discuss issues relating to Africa (although a significant proportion of them are more closely affiliated with US African-American issues). These lists and newsgroups are almost entirely hosted off-continent except for a number in South Africa, North Africa and Kenya. There is a list for almost every nation as well as others on more general topics ranging from African Cinema to Post Colonialism. In the area of ICTs in Africa, AFRIK-IT is the only notable public list, and it is run from Ireland by the University College of Dublin (which happened to be where the person who started the list was studying).

There are other announcement and discussion lists with a smaller circulation, many of which focus on some of the programmes the international communities are carrying out in Africa, such as the African Information Society Initiative's AISI-HITD-CL and its associated African Technical Advisory Committee ATAC-CL, the

PICTA-CL and SCAN-ICT-CL mailing lists hosted by Bellanet.

There are also some more specialised lists relating to African ICTs in particular sectors, regions or countries, notably:

AFAGRICT-L - The use of ICTs in agriculture and natural resource management in Africa, initiated by CTA and hosted by Bellanet

AFRINIC-DISCUSS - The list of the Interim Committee and interested parties to establish Africa's NIC, hosted by ISP UUNET/Ifafrica in Johannesburg.

IOZ - The South African Internet Service providers list hosted by ISP Citec in Johannesburg

EAI A - The East African Internet Service Providers Association, hosted by UNON in Nairobi.

Linux user-group lists hosted in Nairobi, Durban and Johannesburg.

The news media are now relatively well represented on the web. The US Columbia University African Studies department has identified in the region over 120 different newspapers and news magazines that are now available on the Internet, of which over 60 percent are published on the sub-continent, in about half of the countries (23). Those most well represented in this area are again those with more advanced Internet sectors - Côte d'Ivoire, Egypt, Ghana, Kenya, Senegal, South Africa, Tanzania, Zambia and Zimbabwe. Also of note are the efforts to host daily newspapers by the ISP AfricaOnline which has offices in 6 countries.

There are two major continent-wide African news agencies, both of which extensively use electronic media - Inter Press Service (IPS) and the Pan African News Agency (PANA). Sub-regionally, Southern Africa has the only active regional news agencies using ICTs - the Southern African Broadcasters Association (SABA) and the Media Institute of Southern Africa (MISA). In other regions, use of ICTs amongst the media is much lower, but in West Africa, WANAD (West African News Media and Development Centre) is assisting journalists and media outlets to adopt the use of ICTs. Of course international news correspondents in Africa are heavily dependant on ICTs to deliver material to their operations in the US and Europe. CNN and the other international television news companies regularly rent temporary space segments all over Africa with the local representatives of IntelSat and PanamSat to deliver reports and live coverage. Radio journalists (even freelancers) are now sending edited sound files by email to agencies such as the BBC World Service.

Two web search engines specialising on Africa have emerged over the last year - Orientation Africa - <http://af.orientation.com/> and Woyaa - <http://www.woyaa.com/>. As with other similar services elsewhere, these are run by commercial companies which generate revenue through advertising. Orientation is run by Hong Kong based BlackBox and Woyaa by a UK company.

On a sub-regional basis, Southern and North Africa are the most advanced regions in terms of their use of ICTs, followed by East and West Africa with Central Africa lagging furthest behind.

In Southern Africa, South Africa, followed by Angola, Botswana, Mauritius, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe, are at the top end of the scale, with some institutions having leased lines and connectivity outside of the capital. These countries are followed further behind by Malawi, which just beginning to expand connectivity, and Lesotho, which has only just established a public access in Maseru. The institutions providing the most leadership in the use of ICTs in Southern Africa are the South African Department of Communications (Ministry of Posts, Telecommunications and Broadcasting), Department of Arts Culture Science and Technology, CSIR, SangoNet and UniNet (South Africa), ZamNet (Zambia) and CIUEM (Mozambique).

In North Africa, Tunisia is the leading country, followed by Egypt and Morocco which are also relatively well advanced in their use of ICTs, followed by Algeria, which is lagging behind for obvious reasons. The champion agencies in these countries are ATI (Tunisia), ONPT and the local Internet Society Chapter (Morocco), and IDSC/RITSEC (Egypt).

In East Africa, Kenya and Uganda are the most advanced countries, followed by Tanzania and Ethiopia, with Burundi, Rwanda, Somalia and Sudan falling far behind. Leading ICT support institutions in the sub-region are UN DHA, the East African Internet Association (EAI A) and HealthNet (Kenya), the East Africa Help Desk (Uganda), UN-ECA (Ethiopia) and COSTECH (Tanzania).

In West Africa, Senegal and Ghana are the leaders, followed by Benin, Burkina Faso, Côte d'Ivoire, Mali and

Niger. Further down are Guinea and Guinea-Bissau, with Liberia and Sierra Leone last. The leading ICT support agencies in West Africa are UCAD, ENDA and ORSTOM (Senegal) and NCS (Ghana).

Central Africa is still at a very low level of development in ICT use with Cameroon and Gabon being the most advanced countries, followed by Nigeria, Chad, Central African Republic, Equatorial Guinea and then the DRC and Congo. The leading ICT support institutions are NACETEM (Nigeria) and ENSPY/UniYaounde (Cameroon).

Aside from Mauritius, and the Seychelles, the island countries are all at relatively low levels in the development of ICT use, with Madagascar being the most advanced of the remainder. The leading agency in this area is the Mauritius National Computer Board.

Current and Planned initiatives to improve Africa's Information Infrastructure

Regional collaboration within Africa is being increasingly seen as an important means of addressing the need for improved ICT infrastructure. Action has been seen on a number of fronts in this area, starting with the Conference of African Ministers of social and economic planning who requested the UN Economic Commission for Africa to set up a 'High-Level Working Group' to chart Africa's path onto the global information highways. Hosted by the Egyptian Cabinet Information and Decision Support Centre (IDSC) in Cairo, an expert group developed a framework document entitled the African Information Society Initiative (AISI), which was adopted by all of Africa's planning Ministers at the subsequent meeting of the Conference of African Ministers in May 1996.

AISI calls for the formulation and development of a national information and communication infrastructure (NICI) plan in every African country, driven by national development priorities, and proposes co-operation among African countries to share the success of experiences. The countries that have so far begun the process for developing in-depth national information infrastructure and communication development plans are Benin, Burkina Faso, Cameroon, Comoros, Ethiopia, Lesotho, Namibia, Mozambique, Rwanda, South Africa and Uganda. The experience developed by these countries in trying to formulate new policies will be of considerable interest to others considering the same undertaking.

Since then, communications ministers from over 40 African countries have provided high-level endorsement for telecommunications development policies encapsulated in their common vision document published last year called the African Connection. (see [Infrastructure Summary](#))

The next stage of the project is to open an African Connection Telecentre in all 52 African states. This is in concert with recent efforts to improve accessibility to ICTs in rural areas through the use of shared public access facilities which exploit the convergence of technologies to provide cost effective services in under-served and remote locations. Some of these services have grown out of existing public phone shops, such as in Senegal where about 70 phone shops now provide Internet access. The concept has also received considerable support from the ITU and other members of the international community, as well as a number of national governments and public telecom operators.

This has resulted in over 20 pilot telecentres scattered through the continent (with the majority in Ghana, Mozambique and Uganda, as well as in Benin, South Africa, Tanzania, Zambia and Zimbabwe) set up to test different models, means of implementation and mechanisms for sustainability. Development agencies active in this area include the British Council, IDRC, ITU, UNESCO, the World Bank and USAID.

At a sub-regional level, SADC and COMESA have both adopted a variety of measures to improve the use of ICTs, most notably:

SADC's model telecom legislation which has been adopted by a majority of member states and is therefore a legally binding protocol.

The formation of the Telecommunication Regulators Association of Southern Africa (TRASA) which acts as a forum for regulators in the region to exchange information and experience.

The ComTel project to develop the terrestrial telecommunication links between neighbouring states in COMESA, harmonise and upgrade the cross-border information systems in transport, customs, import/export and trade.

The region's telecommunication links to the rest of the world are also in for substantial change with a large number of international telecommunication infrastructure building initiatives having been announced in the last 2-3 years. Aside from projects aimed directly at the African market, a number of the LEO satellite projects planned for the much larger European and North American markets will also cover Africa.

With the worldwide recognition of the importance of ICTs in accelerating development, a number of other recent international development assistance initiatives have improved the prospects for wider access to information and communication networks on the continent, especially in rural areas. Many of the initiatives are

part of the AISI Framework Sub-programme on Connectivity being co-ordinated by ECA and UNDP. In addition, to address the growing need for co-ordination and collaboration, donors and executing agencies involved in ICTs in Africa have agreed to establish an ongoing forum for information exchange on projects called Partnerships for ICTs in Africa (PICTA).

A large number of ICT development projects in Africa have been identified, among the potentially most important are:

The UN Secretary General's System-Wide Initiative on Africa, which includes ICTs as one of the major components in a \$11.5 million programme called 'Harnessing Information Technology for Development' (HITD/SiA), and is supported by the various UN partners.

The US's USAID/Leland Initiatives which are assisting with developing Internet connectivity in 20 African countries in return for agreements to liberalise the market to 3rd party Internet service providers and to adopt policies which allow for the unrestricted flow of information. New initiatives for Leland announced by vice president Al Gore recently include a programme for: '1 Million PCs for Africa, 1000 schools connected and 100 Universities connected'. In June '99 new initiative to increase Internet access and use in developing countries was announced. The ten targeted developing countries include Guatemala, Jamaica, Bulgaria, Egypt, Morocco, Ghana, Guinea, Uganda, South Africa, and Mozambique. The U.S. is actively encouraging other interested countries to join in this initiative, which is part of a broad effort by the U.S. to foster the information industry worldwide. Through the initiative, these countries will collaborate with the U.S. government, the private sector, multilateral organizations, and non-profits to help them use electronic-commerce and the Internet as tools for economic development. Specific aims of the initiative include fostering the deployment of specific Internet applications such as micro-e-commerce, telemedicine, distance education, and improved access to government services.

The ITU's programme for Africa which involves various rural, community telecentre, health and satellite projects emanating from the Buenos Aires Action Plan, is being conducted in co-operation with UNESCO, IDRC, WHO and others.

The World Bank's activities to assist in telecommunication and ICT development in about 25 countries in Sub-Saharan Africa. Initiatives include the African Virtual University (AVU), Economic Toolkit and Workshops for Internet Connectivity in Africa, the Rural Telecommunications Field Trial and Commercialization Pilot in Kenya, and the Global Connectivity in Africa Conference. The Bank expects to be heavily involved in sector reforms and privatization over the next few years with a view to mobilizing private participation for public objectives, to help remove market imperfections, and, where necessary, to attract private investment. It will focus on the rural sector and on information strategies, building infrastructure and applications.

IDRC's Acacia programme which has allocated CAN\$60m over the next 5 years to developing the use of ICTs in local communities in Africa.

UNESCO's IIP programme, which has already (with funding from the Italian and Dutch Governments) been executing the RINAF (Regional Informatics Network for Africa) project to develop a self-governing programme of cooperation with African Member States in this area.

UNESCO has also recently established the Creating Learning Networks for African Teachers project to assist teacher training colleges develop literacy in ICTs and their use for education, and to connect them to the Internet. The project, already been implemented in Zimbabwe, is being initiated in Senegal, and is intended to be extended to twenty countries with extrabudgetary support.

The multi-donor InfoDev fund established by the World Bank, which has supported the South African Telematics for African Development Consortium and the \$1 million African Virtual University Project.

UNDP's Africa Bureau has agreed to a \$6m fund to improve Internet connectivity in Africa in a project called the Internet Initiative for Africa (IIA). The countries currently participating are: Angola, Burkina Faso, Cap-Verde, Gambia, Mauritania, Namibia, Nigeria, Democratic Republic of Congo, Sao Tome et Principe, Swaziland, Chad and Togo.

UNDP's Sustainable Development Networking Programme (SDNP) has 10 operational nodes in Africa - Angola, Benin, Cameroon, Chad, Gabon, Malawi, Morocco, Mozambique, Togo and Tunisia. National SDNP projects are funded for 2-3 years and are expected to provide seed money towards sustainability, either through sale of services or adoption within government budget.

UNEP's Mercure project which uses VSAT technology to establish an environmental information exchange network in Africa. UNEP is co-operating with the ITU to examine the possibility of using the spare bandwidth of the network for other functions.

The UN Office for Outer Space Affairs is proposing the COPINE project to donate groundstations and

transponder time to African research institutions.

The various activities of Agence de la Francophonie and related international organisations such as ORSTOM, AUPLEF, UREF, REFER, which are providing support for ICTs in Francophone countries, most of which are in Africa. Recently the AFRINET project was launched which is providing web servers and related support at a ministerial level to Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Madagascar, Mali, Mauritius, Mauritania and Senegal. Also, the Banque Internationale d'Information sur les Etats Francophones (BIEF) project is establishing web servers in Benin, Tunisia, Mauritius and Morocco where databases and information from a number of other countries is hosted.

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