ADVANCED UNEDITED DRAFT (for comment)

Note by the Secretariat

WSIS follow-up Report 2008

This report seeks to provide an analysis of trends in the Information Society and a review of activities and progress at the international and regional levels in the implementation of the outcomes of WSIS. The report summarises efforts made in 2007 and early 2008 by entities in the United Nations system in implementing the outcomes of WSIS. Where relevant, the report also includes activities of other International Organizations and NGOs, civil society and business entities related to WSIS implementation.

Contents

Part 1   Recent Global ICT-Developments

I   Background

The Economic and Social Council, in its resolution E/2006/46 of 28 July 2006, requested the United Nations Secretary-General to inform the Commission on Science and Technology for Development (CSTD) on the implementation of the outcomes of the World Summit on the Information Society (WSIS) as part of his annual reporting to the Commission. In its resolution 2007/8 of 25 July 2007, entitled "Flow of Information for the Follow-up of the World Summit on the Information Society", the Council reiterated the above request, and further requested the United Nations organizations acting as action line facilitators, United Nations regional commissions, main theme facilitators, the Global Alliance for Information and Communications Technologies and Development (GAID) and other entities to submit to the secretariat of the Commission their respective reports, as inputs towards the elaboration of the annual report of the Secretary-General to the Commission, with their own executive summaries. The Secretary-General's report (A/63/72, E/2008/48) submitted in response to those requests, provides a general summary of progress towards implementation of the Summit outcomes at regional and international levels.

To complement the above report, the Secretariat of the CSTD prepared this WSIS Follow-up 2008 Report, which aims to give a more detailed analysis of current trends in the Information Society. It further aims to provide an expanded accounting of efforts at WSIS implementation at regional and international levels.

II   Introduction

ICTs have become so pervasive that it is difficult to find aspects of human existence that are left untouched. Personal communication has been revolutionised by telephony, e-mail and instant messaging. Governance, education and health care, as well as decision-making and management in all fields of endeavour have been transformed by immediate access to data, knowledge and expertise. And when combined with the ability to carry out rapid financial transactions, the use of ICTs has become a prerequisite for living in modern society, not to mention providing new work and leisure opportunities. However the majority of the world's population have yet to benefit from these developments. This phenomenon – the so-called 'digital divide', exists not only between developed and developing countries, but also within countries, where people who are poor, rural, disabled and/or women, may be excluded. The growing worldwide recognition of this inequitable situation, along with the need to better understand the widespread effects of ICTs on society led to the World Summit on the Information Society. The Summit set forth a vision of the future Information Society and identified a series of activities and commitments necessary to reduce the divide and to assess the impacts of ICTs. Two and a half years has passed since the second phase of the WSIS Summit in Tunis in November 2005, and considering that many development projects have a two- or three-year lifespan, an assessment of progress in 2008 marks an important time to gauge the impact of the initiatives spawned by the Summit and to learn the lessons necessary to guide future activities. It is also noteworthy that 2008 marks the mid-term to the 2015 target date of Millennium Development Goals (MDGs).

III   Global Progress Towards an Information Society

In such a fast moving area as ICT development, up-to-date reporting is needed for assessing trends in the information society. Unfortunately most global assessments of ICTs rely on some data that is at least one, if not two or three years old, especially for developing countries, and at the time of writing, there were no worldwide assessments of all the relevant data for 2007. Fortunately, data for the newer technologies, such as mobile telephony and Internet-use, is generally more up-to-date. As a result, this report makes use of a wide range of different sources[1] in order to present the most up-to-date picture of current trends, although there are necessarily some gaps for which 2006 data is used where available. Also, some of the regional statistics reported here are not necessarily in alignment with the regions used by the UN Regional Commissions because industry associations and regional economic bodies usually report using different country groupings.

III.A   Trends in ICT Infrastructure - Mobile Phones, Internet and Broadband

Global Trends
The year 2008 is an important marker in the history of progress toward a global Information Society. It is the year where over half the world's population obtained at least some level of connectivity - via mobile telephony. There were an estimated 3.3 billion mobile subscriptions[2] at the end of 2007, and compensating for countries where mobile penetration is over 100%, the expected double-digit growth this year will put the number at well over 50% of the 6.6 billion people on the planet. In addition, 80–90% of the world's population now lives within range of a cellular network, double the level in 2000, while only 27 countries have mobile penetrations under 10%. By contrast, the global fixed line penetration was 19% in 2006 according to the ITU, with little or no prospect of increase, and is in fact declining in some developed countries.

Aside from the convenience of mobility and the ability to provide service where no fixed infrastructure exists, growth in mobile phone use has also been fuelled by the ability to provide short message services (SMS). SMS not only provides a popular low-cost alternative to voice communications that is especially popular in low-income countries, but also a wide variety of data services, such as financial transactions, news and market price updates (see below). It is estimated that 1.9 trillion text messages[3] were sent in 2007, producing revenues of USD 52 bn for mobile operators. Messaging is forecast to grow almost 20% in 2008 to reach 2.3 trillion messages. The Asia Pacific region and Japan, in particular, are the biggest users of mobile messaging, where it is estimated that 1.5 trillion messages were sent in 2007, while the total for North America and Europe was 392 billion messages, leaving about 8 billion for the remaining regions.

Current trends also highlight the significant shift toward the South that is taking place in the geopolitical information landscape. The number of people in developing countries that are connected now through mobile phones outnumbers those in the developed countries. At the end of 2006, ITU figures showed that 61% of the world's mobile subscriptions were in developing countries. This is also reflected in the concentration of ownership in ICT infrastructure, which is also shifting toward developing countries - some of the largest mobile operators in the world are now based in Africa, the Middle East, India, China

---

[1]   These include industry association statements, commercial market research reports and a variety of development oriented studies and outputs from projects.
[2]   Informa study, see http://investing.reuters.co.uk/news/articleinvesting.aspx?type=media&storyID=nL29172095
[3]   Gartner study, see http://www.sms**text**news.com/2008/05/2_3_**trillion_messages**_sent_this_year.html

and Indonesia, and the largest international submarine fibre cable companies are Asian[4] - FLAG, VSNL and Global Crossing.

The Internet gap between North and South is also closing, although more slowly. While in 2002, Internet penetration in developed economies was ten times higher than in developing economies, in 2006 it was only 6 times higher. The global Internet community grew by 280% between 2000 and 2008 and in March 2008, there were about 1.4 billion Internet users worldwide[5], giving an overall penetration rate of 21% of the world's population. However, in 2007, there were more Internet users outside North America and Europe, buoyed by rapid growth in China, which has the second largest Internet users in the world (90million) after the US (150 million). Regionally, North America and Europe recorded the slowest Internet growth rates over the 2000–2007 period (120% and 151%, respectively), while the Middle East and Africa recorded the fastest growth rates (920% and 883%, respectively).

Although a large segment of the world's population still lack even the most basic levels of connectivity, the current double digit growth rates in developing countries for mobile and Internet-use means the digital divide is increasingly moving away from basic connectivity to issues of speed (bandwidth) and availability of local services. In this respect, the 'broadband divide' is becoming an increasingly important issue considering that most local Internet services cannot thrive or be used efficiently without low-cost broadband, and that the gap in broadband penetration between developed and developing countries has only changed marginally between 2002 and 2006. In 2002, developing countries accounted for only 31% of the world's broadband subscribers, while in 2006 this figure was 35%.

In addition, those who are already connected are the wealthier segment of the world's population, and the challenge is how to reach the next 3 billion, of which the majority live on less than USD 2 a day[6]. The cost of access and level of infrastructure pervasion in developing countries are two factors that will largely determine the potential for addressing the digital divide. While telephony and Internet access costs have been generally much higher in developing countries than in developed economies, there are encouraging signs that this is beginning to change. Mobile call tariffs are now much lower in some developing countries than in developed ones, and always-on Internet access is available for as little as USD 6 a month in India (albeit not the broadband speeds commonly available in developed countries). Mobile phones costing less than USD 30 are now available and the USD 100 PC could shortly be within reach. Investment in telecom infrastructure also continues to increase rapidly, with the global market for telecommunication infrastructure services reaching USD 70 billion in 2007, an 8% increase on 2006.

If these trends continue, the WSIS goal of ensuring that "more than half the world's inhabitants have access to ICTs within their reach by 2015" can be said to have been met by 2008, through mobile phones, notwithstanding their generally higher cost and more limited Internet access. And while there may be some pockets of disconnection remaining as a result of geographic isolation[7] or exclusion

---

[4]   Taking directly owned and operated capacity, Indian companies manage just under a quarter of all the world's major undersea cables as measured by route kilometres. Measured in terms of capacity, Indian firms directly own and operate 44% of all capacity and 70% of upgradeable capacity for the undersea cables.

[5]   See http://www.internetworldstats.com

[6]   The world's lowest average revenue per user (ARPU) of a mobile telecom operator was recorded by Bangladesh's Banglalink in 2007, with an ARPU of USD 3.3 per month.

[7]   In this respect, geographically dispersed islands with small populations suffer from low economies of scale and the high cost of infrastructure (especially international). As a result special efforts are likely to be necessary to ensure that they are not left behind.

because of factors such as language, gender or disability; at some point in the medium-term the digital divide will no longer be related to basic ICT-access but will be measured in levels of ICT-use. To reach this point, many countries have still to improve access to basic telecommunication infrastructure and Internet services. The obstacles to promoting infrastructure development have often been attributed to policies that do not take into account the capabilities of new technologies, and restrictions on market entry, which limits competition in the telecommunication sector[8].

Global and Regional Variations in Infrastructure
Most countries in Asia and Africa have been lagging behind in their progress towards an Information Society, largely because of their low-income levels and lack of ICT infrastructure. Internet penetration for Asia was 13.5% at the end of December 2007, while the majority of rural Asians today still do not have access to basic telephony, let alone to Internet. Moreover, South Asia, which is home to about 50% of the world's poor, has more people who do not have access to the Internet or telephony than the rest of the world combined. The majority are similarly excluded in Africa, and although the number of Internet users in Africa continues to grow strongly, by December 2007, only 5% of the African population had access to the Internet and broadband penetration was below 1%.

As would be expected, North America and the more developed countries in Europe, the Caribbean and Asia, have the most advanced infrastructure. In these countries, fixed and mobile penetration rates are close to 100%, and Internet penetration rates range between 71% (North America) and 43% (Europe). These high levels of access, combined with the higher income and education levels of the population in these regions have led to much greater diversity and use of online services, especially where broadband is widely available.

Broadband services are now available in at least 170 economies but high-income economies account for nearly three-quarters of the total 300mn broadband subscribers recorded at the end of 2007 (giving a global penetration rate of 4.6%). Denmark, Finland, the Netherlands and Sweden are the world leaders in broadband deployment with penetration rates of over 30% at the end of 2007. These countries, together with the United Kingdom, Belgium, Luxembourg and France, all had broadband penetration rates higher than the US (22.1%) in July 2007. Lower-middle income economies accounted for 20% (with China alone accounting for 87% of these or 15% of the global total). Low-income countries accounted for less than 1% of total global broadband subscribers, with India and Vietnam accounting for virtually all of these, partly because broadband is often only available in the major cities. In the United States, 53% of households have broadband, and about 72% of all household Internet connections are now broadband[9], while in Japan and Spain, efforts by operators to encourage consumers towards broadband have resulted in three-quarters of Internet subscribers now using broadband. In the Republic of Korea and Canada, virtually all Internet subscribers already have broadband.

There is also a striking digital divide in terms of the price of access to broadband between different parts of the world. Users in low-income countries pay on average, some US$186 per month[10] for every 100 kbit/s of connectivity, which is more than ten times higher than the average price paid in high-income

---

[8]   Where markets have been opened this has often been limited to one or two new providers, or the high cost of licenses has limited market entry.

[9]   Leichtman Group – see http://www.clickz.com/showPage.html?page=3626328 also see: http://www.websiteoptimization.com/bw/0704/

[10]   See: www.itu.int/osg/spu/publications/digitalife/docs/digital-life-web.pdf

economies, while prices of below USD 0.10 per 100 kbit/s per month are available in Japan and Republic of Korea. The high costs in low-income countries are an even more extreme barrier when the much lower income levels of the majority of people in these countries is also taken into account.

Aside from the high cost of access relative to income levels in developing countries, which has been a major factor in limiting broadband uptake, another part of the reason has been the low penetration of fixed line infrastructure. While mobile and other wireless solutions for broadband access have recently shown major promise for meeting the needs of developing economies, the developed countries have benefited from their high levels of fixed infrastructure, which is particularly amenable to provision of high-speed broadband.

Mobile telephony is now the primary mode of ICT access in the LDCs, where mobile phones outnumbered fixed lines by almost eight to one at the end of 2007[11] and in some countries the ratio is as high as 20 to one. The overall average in sub-Saharan Africa is 10 to one, with less than 3% of the approximately 400 000 localities in Africa having a fixed line telephone connection and less than 0.5% of African villages with a public Internet facility. On the other hand, mobile communications covered about 45% of the villages 2006.

Variations in Infrastructure within Regions
Europe
While some countries in Europe have some of the highest levels of ICT uptake worldwide, the region also includes many countries in Eastern Europe, the Caucasus and Central Asia (EECCA) that have low levels of ICT uptake, which has been observed to be largely due to inadequate policy environments which have led to lack of infrastructure and high costs of Internet services.

As the most advanced ICT region in the world, the European Community (EC) countries probably represent the benchmark in terms of the positive outcomes of concerted policy promotion for the WSIS goals. Under the i2010 digital-led strategy for growth and jobs, which the EC launched in 2005, a variety of policy actions have been adopted to reduce barriers to market entry, harmonize national regulatory frameworks, encourage research and development in the area of ICT and promote a variety of public projects. Programs aimed at overcoming the digital divide, such as e-Education, e-Accessibility, e-Health, e-Governance, e-Justice and e-Environment, have given further incentives for users to get online and for service providers to provide the needed infrastructure. As a result, about 50% (250 million) of the population in the EC are regular Internet users, of which about 100 million have broadband connections. In April 2008, it was reported that 96% of schools are connected to the Internet, two thirds of which are on broadband, and half of all doctors make use of broadband. .

Nevertheless, there is a small but growing gap in broadband penetration between the best and worst performers in the EU[12], for which policy makers cite the same factors present in other regions - lack of competition and regulatory weaknesses as the main obstacles to growth. The EU's Telecoms Commissioner noted in March 2008 that competition is limited for access to the fixed network, which is still dominated by incumbent infrastructure. In addition, only 30% of major operator business is outside

---

[11]   http://www.unctad.org/en/docs/a63d72_en.pdf
[12]   The gap between EU Member States with the highest and lowest penetration increased from 27.4 percentage points in January 2007 to 28.0 in January 2008.

the home market, showing that even the EU still lacks an attractive single market for businesses and services.

Africa
The pervasiveness of the African region's ICT infrastructure is very low and extremely uneven, largely owing to the wide variation in incomes, population size and telecommunication infrastructure policies. Fixed lines currently reach less than 4% of the population, and over 75% of them are found in just 6 of the 53 African nations. This has encouraged the uptake of mobile phones with mobile growth rates being the highest in the world, led by countries with more recent market entrants, more competitive pricing and improving coverage. For example Nigeria's mobile phone users are currently increasing at over 50% per year. A number of regional mobile operators in Africa have also deployed 'borderless roaming' between their networks on the continent, allowing people to make low-cost international calls to users of the same network operator in another country.

Africa had a total of 44 million Internet users by March 2008, giving a penetration rate very similar to fixed line infrastructure - about 4.7%. Four out of the 53 countries in Africa account for almost 60% of Internet users in the region, and only 22 of the 53 countries have broadband providers, resulting in an average broadband penetration rate for the continent of below 1%. Countries with Internet populations over of over 1 million people are located in (in order of size): Nigeria, Morocco, Egypt, South Africa, Sudan, Kenya, Algeria, Tunisia and Zimbabwe. However the only countries with penetration rates over 15% are (in order): Seychelles, Mauritius, Morocco and Tunisia.

Asia
Although some Asian countries have pervasive ICT infrastructures, others are at the early stages of adopting ICTs. Mobile penetration ranges from below 1% in economies like Myanmar and Kiribati, to 90% or more in Australia, Taiwan Province of China, Singapore, Hong Kong (China) and Macao (China). Internet penetration ranges from below 1% in economies such as Timor-Leste, Myanmar, Bangladesh, Cambodia, Lao P.D.R. and Nepal, to above 65% in Japan, Republic of Korea, Australia and New Zealand. In many developing countries in Asia, improvements in connectivity have been tempered by their limited penetration in rural areas. Similar to Africa and Europe, slow connectivity in Asia has been caused by inadequate and restrictive policy environments, lack of focus on technological R&D innovations, and limited understanding of the effects of ICTs on communities.

The Americas
The Americas are characterized by a North-South divide in Internet access, with the United States and Canada having a 71% Internet penetration rate, or roughly 3.5 times the rate of South America, Central America and the Caribbean, where it stood at around 22% at the end of 2007. In the Americas, 81% of those who use the Internet are on broadband[13]. In the US and Canada 19% and 22% of the total population have access to broadband, respectively. In South America, the broadband leaders are Brazil, Mexico, Argentina, and Chile, which accounted for around 80% of all broadband subscribers in the region in early 2007. Chile (at 6.8%) has the highest proportion of broadband users, followed by Argentina (4%) and Uruguay (3.1%). The three largest fixed telephone networks – in the US, Canada and Brazil – account for more than 80% of all fixed lines on the two continents. Latin America and the Caribbean have shown strong growth in the mobile sector, with most countries in South and Central America now showing mobile penetration rates of over 50%. Apart from a few small Caribbean islands

---

[13]   http://www.itu.int/ITU-D/ict/statistics/ict

with mobile penetration of over 100%, the highest rates are found in Chile, Jamaica, and Argentina, with penetration rates of about 80%. Cuba continues to stagnate at 1.4% mobile penetration, while Costa Rica, Honduras, Nicaragua, Bolivia and Peru have about 30% of mobile penetration. Seven countries - Brazil, Mexico, Argentina, Colombia, Venezuela, Chile, and Peru – account for around 84% of the region's mobile subscribers, while Brazil and Mexico together account for 51% of all mobile subscribers in Latin America.

III. B   Wireless Trends - Mobile Data and Wireless Broadband

Clearly, the major ICT trend over the last year has been the continued rapid growth of mobile phones and their emergence as the primary form of ICT access for over 50% of the world's population in 2008. Global sales of mobile phones surpassed 1.15 bn units[14] in 2007, a 16% increase from 2006. There are now estimated to be three times as many mobile phones as personal computers and nearly twice as many mobile phones as TV sets. In addition twice as many people now use SMS text messaging on a phone as use e-mail. Furthermore, recent advances in mobile data technologies have seen mobile phone operators and handset manufacturers launch services and phones in most of the larger economies in 2007 that make it much easier, faster and cheaper to access the Internet. This is expected to spur wireless broadband uptake considerably over the next couple of years and Nokia estimates that there will be 250 million Internet capable mobile phones by 2010.

By the start of 2007, 79 countries around the world had launched commercial services for cellular mobile services with speeds of 256kbit/s or more[15] (in contrast to only 18 launches during 2006). Popularly referred to as third-generation (3G) mobile, there are now more 100 million users worldwide that are able to use their mobile phones at broadband speeds. Along with the more mature systems, such as the Global System for Mobile (GSM), an increasing variety of new technologies have been deployed and it is unclear as yet which standard will become dominant. At present, the largest group using a particular technology are the mobile GSM operators. However, while their growth in voice subscribers continues, other newer fixed and mobile technologies, such as WiFi, WiMax and CDMA are also being deployed to meet the demand for broadband, either by the existing GSM operators, or by new entrants.

Mobile operators using a competing technology to GSM, called Code Division Multiple Access (CDMA) are now present in 30 countries and users of these systems have shown strong growth over last year, increasing by 16% to more than 431 million by the end of 2007[16]. The Asia-Pacific region added the most subscribers, while Europe, the Middle East and Africa (EMEA) grew the fastest. CDMA-2000 (EV-DO) broadband subscribers showed the highest growth rates from 55 million to 90.5 million in 2007, with an annual growth rate of more than 64%. One of the technologies being adopted by the GSM operators called Wideband Code Division Multiple Access (W-CDMA) is now present in 49 economies, with about 100 million users at the beginning of 2007, and is particularly popular in Europe. Twenty five countries have now also launched an advanced version of W-CDMA called High Speed Downlink Packet Access (HSDPA), which offers much faster speeds - up to 14.4 Mbit/s. WiMAX has also shown much stronger growth in 2007, with the total number of subscribers worldwide growing by 85% last year to surpass 1 million. More than 160 WiMAX initiatives have been recorded

---

[14]   http://www.informationweek.com/blog/main/archives/2008/01/115_billion_mob.html

[15]   384 kbit/s – 1.4 Mbit/s, is commonly provided, with the industry promising even higher speeds in the near   future. For example, Telstra, a mobile operator in Australia, claims that it will soon be providing peak network speeds of 14.4 Mbit/s over its HSDPA network

[16]   See: http://news.soft32.com/431-million-cdma-subscribers-worldwide-in-q4-2007_6068.html

worldwide and two of the largest operators are based in the US and two in Spain. Although off from a low base,WiMAX has expanded rapidly in Africa with about 20 000 corporate links[17] at the end of 2007.

Delays in finalizing WiMAX standards and in obtaining licenses for WiMAX radio spectrum have been said to be partially to blame for the slower than expected growth in WiMax penetration, compared to WiFi, which has exploded worldwide using unlicensed radio spectrum. The number of WiFi users worldwide was expected to reach 707 million in 2007, and while many of these may also use a separate broadband connection, increasing numbers are able to use public hotspots to access the Internet. This has been boosted by the inclusion of WiFi in mobile phones, low-cost laptops and gaming consoles[18]. A total of 134 million WiFi devices were sold in 2007 and this number is expected to reach 500 million units by 2012. There were an estimated 70 000 WiFi hotspots in over 100 countries in 2007. Hotspot provider iPass reported that use during the first half of 2007 had increased 141% in comparison to the first half 2006. The regions of the world in which commercial Wi-Fi hotspots are used most frequently are North America (56% of the total worldwide usage), Europe (36%), and the Asia-Pacific (6%).

The high popularity and low cost of WiFi devices, which are now less than USD 30, has also led to increased numbers of initiatives by municipal authorities to establish city-wide public WiFi networks. The US has led these efforts with about 400 such initiatives to date. UNDP and other agencies have highlighted the potential of WiFi and other wireless technologies to allow local communities to establish their own networks. Although regulatory environments in many countries do not yet allow private unlicensed networks to operate[19], such community-built infrastructure has become popular in some of the more open developing countries and in rural communities in developed countries.

III. C   Trends in ICT Access Devices and Shared Facilities

The relatively high cost of computers has been a significant restraint on increased uptake of more advanced ICT services, especially in low-income countries. As a result, there are only about 1 billion PCs in use worldwide[20], with by far the majority of these concentrated in developed countries. The US has the largest proportion, with about 25% of the total, followed by Japan with 8%. About 73% of all PCs were located in just 15 countries, with China, India, Mexico and Russia being the only non-high-income countries in the list. However, computers have continued to drop in price and increase in power, which saw the release of machines costing about USD 200 in 2007. This trend has continued to fuel worldwide PC sales, which totalled 271 million units in 2007, a 13% increase from 2006. Growth was slowest in the US at 5% with 65 million units sold, while the European, Middle Eastern and African (EMEA) regions continued to be the largest PC market in 2007, and the Asian/Pacific region was the second largest market.

The further narrowing of the gap in performance and price between desktop and laptop (portable) PCs has resulted in an increasing proportion of laptops being used[21], and this is expected to reach 50% by the end of 2008. The reduced cost and increased demand for laptops is now also resulting in their

---

17   http://www.itu.int/osg/spu/newslog/Twenty+Thousand+**WiMAX**+Subscribers+In+**Africa**+At+The+End+Of+2007
18   Game console manufacturer Nintendo reported in June 2007 that 5 million WiFi users had logged on to their network since it was launched in November 2005.
19   Or where they do, they are often precluded from connecting to the public (licensed) networks.
20   http://www.forrester.com/ER/Press/Release/0,1769,1151,00.html
21   The increased demand for laptops has also been fuelled by the growing pervasiveness of wireless networks in homes and public locations.

subsidisation by Internet service providers, which mirrors the mobile phone business model where the handset is given away or sold at a steep discount. The cost to the operator is absorbed in the air-time contract. Internet providers America Online and Orange launched laptop subsidy programmes for 2-year contracts in the US and UK at the end of 2006 and in early 2007, and other operators, such as T-mobile are expected to join the trend. This model could have a major impact in developing countries where lower-income users are less able to foot the high once-off cost of a PC but could absorb the cost in monthly payments.

Increased demand for PCs and laptops in developing countries is also likely to result from the various initiatives to manufacture computers designed for these lower-income markets. This has been highlighted by the One Laptop Per Child (OLPC) programme, a charity which hopes to spread sub-$200 computers to schoolchildren in developing countries. This effort triggered a large number of commercial manufacturers to develop their own low-cost PC designs, the most well-known of which are the Intel Classmate PC, and the ASUS Eee PC, which are also now in commercial production[22]. In November 2007, the OLPC programme started mass production with initial recipients being children in Uruguay, Peru and Mongolia. In a novel fund-raising effort OLPC also launched a 'buy one, give one' project where people in North America are able to buy a laptop for themselves and donate the other to a child overseas. AMD, the largest chip manufacturer in the world has also developed a range of low-cost PC units as part of its 50x15 initiative which aims to help accelerate digital inclusion by enabling affordable Internet connectivity and computing capabilities for 50% of the world's population by the year 2015. By September 2007, the AMD programme has also established about 25 Learning Labs around the world.

While PC costs are coming down, it is unlikely that they will become affordable for the majority of the developing country public in the medium-term. To meet their needs, two other developments are showing promise – the increasing capabilities of mobile phones and Personal Digital Assistants (PDAs) to connect to the Internet, and the growing numbers of public access venues – cybercafes and telecentres, also known as Community Multimedia Centres (CMCs).

Phones that are Internet capable are generally known as Smartphones. While these accounted for only 10% of phone sales in 2007, shipments of Smartphones in 2008 are expected to reach 173 million units[23], an increase of 42% over 2006, and by 2010 this is expected to reach over 1 billion units. While unable to give the same quality of user experience that a PC can provide, recent increases in screen size and better interfaces has improved this considerably, as evidenced by the global popularity of the Blackberry. Smartphones are of course also used to provide the Internet connection for PC.

Facilities that provide public access to ICTs aim to help meet the needs of those who cannot afford their own personal access. The emergence of these facilities has accelerated over the last decade, in both developed and developing countries, in the form of commercial cybercafés and government-supported programmes, often called telecentre initiatives. These are often dedicated facilities but may also be kiosks placed in a public space, or computers added to an existing facility, such as a community centre. Public-private partnerships are also increasingly being used to share the costs of deployment. Although cybercafés and telecentres are now relatively common in small towns and villages throughout the world,

---

[22]   Other similar initiatives include: Alphasmart, Chang Feng, decTOP, InkPC, Intel Community PC, iT, ITP-C, IQ PC, Janata PC, Mecer Education PC, Sinomanic, Sirius, Solo and Terra PHD.
[23]   http://www.gartner.com/DisplayDocument?id=579907&ref=g_sitelink

currently there is a lack of common definitions and inconsistency in efforts to measure the extent of access these facilities provide[24]. As one indication however, there were estimated to be over 50 000 such public access centres in India at the end of 2004 and a 2007 survey[25] found that nearly 36% of the 17 million active Internet users in India obtain access from public facilities.

State programmes for the support of subsidised access at public access facilities are also becoming increasingly common and these efforts are also being supported by international organisations, in particular, UNESCO, the World Bank, the Canadian government's International Development Research Centre (IDRC) and Microsoft. In 2006, IDRC and Microsoft each contributed CAD 17mn to establish a new organisation called telecentre.org, which is devoted to capacity building of telecentre operators in developing countries. The Swiss Agency for Development and Cooperation (SDC), subsequently contributed an additional CHF 5 million to the project, which aims to train over a million people to operate telecentres.

Providing ICT access in schools and libraries is also gaining increasing attention. The provision of ICT access in schools is now a strong priority in most developing countries and is being supported by international agencies such as the Asian Development Bank, IDRC, and NEPAD's African e-Schools programme. While libraries have not until recently been seen as an important means of providing public access to ICTs, the Bill and Melinda Gates Foundation established a Global Libraries initiative in 2006, which provided over USD 30mn in 2007 to support the provision of free Internet access in national public library systems in eastern Europe, Asia, Africa and Latin America, and to research and promote the use of public access ICT facilities. In addition, a number of private companies are supporting dedicated ICT training facilities and access points through their corporate social responsibility programmes. For example, AMD's initiative mentioned above, and Microsoft, through its Unlimited Potential programme, had by 2007 invested about USD 130mn in supporting community-based technology and learning centres in 89 countries worldwide.

Another approach to providing access for those who cannot afford their own equipment that has recently emerged is to provide them with their own telephone number and a voice mailbox. In South Africa, a company announced a service in early 2008, where agents operate pay phones in shops or kiosks, which provide customers with a free phone number and then sell them airtime. Customers are given a secure PIN code and once they log in, they can make low-cost calls and operate a voice mailbox with free message retrieval.

III. D   Trends in National and International Networks and Traffic
The rapid growth in mobile phone and Internet-use (particularly broadband) is placing increasing demands on the underlying telecommunication infrastructure linking cities and countries. Relatively high volumes of international traffic compared to domestic traffic are needed in developing countries because of the limited amount of local Internet content and applications. In most developing countries, at least 70 or 80% of Internet traffic is international. This pattern has also been reinforced by macroeconomic trends, such as the rapid shift of Business Process Outsourcing (BPO) and call-centres to low-wage nations, greater regional cooperation resulting in increased regional traffic flows, and the

---

[24]   In 2007 the ITU began work to define and track the number of Public Internet Access Centres (PIACs) which is expected to lead to improved information on their availability.
[25]   http://www.iamai.in/Upload/Research/I-Cube-**2007**-Summary-Report-final.pdf

emergence of pan-regional operators, which require increased intra-regional telecommunications bandwidth.

The capacity limitations of satellite, combined with rapid growth in traffic, is resulting in much increased use of fibre-optic cable for international infrastructure and domestic links between cities. The period leading up to the 'dot-com bubble' in 2000, saw billions of dollars of investment in new fibre-optic cable in developed countries, while developing countries were left out of this trend due to their perceived smaller markets. Since then, growth in demand in developing regions has shown that, even for countries with small populations and low levels of development, there is sufficient demand to warrant the construction of fibre-optic connectivity and the discontinuation use of satellite.

As of 2007, more than half (32) of the world's 53 poorest nations had no access to international fibre-optic connectivity[26], representing an unserved population of close to half a billion. In addition, many other developing countries only have one international fibre-optic link. This not only encourages monopoly pricing but also fails to meet the need for more than one physically separate international connection to ensure continuity of service. This was highlighted by the submarine cable disruptions in the Middle East in early 2008, which resulted in some countries having to drastically reduce traffic flows while they reverted temporarily to low capacity satellite links. At the same time, additional infrastructure is being required because many of the existing fibre cables were designed in the pre-Internet era, and the levels of international capacity now being required means these cables cannot accommodate long-term demand.

As described in the next section of this report (chapter IV, C2), there are a large number of international fibre-optic cable projects currently taking place, either to link countries not previously connected to the global-fibre grid, or to augment existing international links. Of particular note are the projects linking the countries of the Greater Mekong Sub-region (GMS), and plans to lay cable along the East coast of Africa, which forms the longest stretch of coastline in the world with no international fibre-optic connectivity. These and other similar developments are expected to address the need for international bandwidth for almost all countries, except some of the smaller and more remote islands, which may be too isolated and have such tiny populations that fibre-optic cable cannot easily be economically justified. In particular, these include the LDCs of the South Pacific, the Laccadive Islands, Seychelles and Rodriguez Island (part of Mauritius) in the Indian Ocean, and St Helena in the Atlantic.

The demand for national fibre infrastructure in developing countries follows a similar pattern to international infrastructure. However, the more rural-based and dispersed population demographics of developing regions means that many more kilometres of fibre are necessary to reach the same number of people as in a developed country. This has led to an initial focus on establishing national backbones to service major towns, and also in many cases to make these serve as international links to neighbouring countries. A major increase in the number of these projects appears to have taken place recently. However, comprehensive information is lacking because data on these important national activities is not consolidated on a global basis. A recent African survey has found the largest build-up of long-distance telecommunication infrastructure recorded to date. Between mid-2006 and the end of 2007, over USD 1 billion in contracts were issued for about 30 000 kms of optic fibre in 17 countries, with loans from China Exim Bank for about two-thirds of the value.

---

[26]   http://www.terabitconsulting.com/public/presentations_downloads.html

For many of these projects, the use of non-traditional infrastructure over which to lay optic fibre, such as rail, gas and electricity networks, is gaining increased attention, especially in developing countries, because this can cut the cost of fibre deployment by a factor of up to 100[27]. This has in part led to the rethinking of telecommunication infrastructure deployment strategies in order to make best use of these options to ensure costs to the end-user are as low as possible. New business models of service provision are now emerging, which separate the operation of the physical infrastructure from the services which run over them.

The underlying infrastructure is provided to competing commercial operators on a non-profit cost-recovery basis in the expectation that the reduced input costs for the retail operators will result in lower end-user charges. Usually called "Open Access Principles[28]", at the simplest level this can mean providing telecommunication operators with equal access to ducts in which to lay their cables. However, deeper application of open access principles are also being adopted, which are based on the fact that in most situations, one or two pairs of optic fibre have more than enough capacity to meet the needs of the people nearby. So there is actually no need to incur the additional expense of multiple operators with duplicate cables. As a result, to increase operational efficiency and drive costs down, national and local governments are establishing and operating their own fibre infrastructure as a public good which is leased to commercial retail service providers at cost. The most well-known example of this is the City of Stockholm's open access network, Stokab. In Africa, the NEPAD Broadband Infrastructure Network (NBIN) (for which plans were announced last year) is to interconnect countries in East and Southern Africa and will also be based on open-access principles.

Until there is more widespread pervasion of terrestrial broadband infrastructure, satellite continues to play a vital role in television broadcasting and in connecting more isolated and rural areas, even in high income countries. In developing regions, even capital cities and other major urban areas are still being served by satellite due to the lack of, unreliability or high cost of terrestrial infrastructure. Two satellites were launched in 2007 to cater for these needs in Africa. In December 2007, after almost a two-decade gestation period, the Regional African Satellite Communication Organisation (RASCOM) launched a satellite with an Africa-wide footprint aiming to reduce costs for countries with no international cable connectivity, as well as to provide domestic links for those with limited national terrestrial networks. In co-operation with China, Nigeria launched a communication satellite in May 2007, with a footprint in 38 African and five European countries. Other developing countries that launched communication satellites in the last 12 months include Brazil, China and Vietnam.

Aside from the ongoing activities to establish national and international telecommunication infrastructure, most countries now also have locally interconnected Internet service providers which helps to reduce international Internet connectivity costs and improves the access speeds to local web sites. Commonly known as Internet Exchange Points (IXPs), these facilities are located in large cities where there are multiple Internet providers. IXPs usually operate on a non-profit basis, allowing service providers to route traffic directly between each other at a low cost, rather than via the international or inter-city links which are usually much more expensive and are often more congested. Close to 300

---

[27]   As a rule of thumb, 'greenfield' fibre deployment (i.e digging a new trench or setting up dedicated overhead poles) will cost about USD 15 000 - 25 000 per km. At the other end of the spectrum, adding an extra fibre pair in the planning stages of an electricity distribution grid will only cost USD 250 – 300.
[28]   Not to be confused with the same term when applied intellectual property – 'Open Access to content, data, etc'.

IXPs were identified worldwide at the end of 2007[29], a growth of over 50% since 2006. However, many developing regions are lagging behind the developed world in this respect, and about 90 countries still do not have even one IXP yet. Regionally, Latin America has experienced the fastest growth in IXPs, which now number 20, almost 100% more than the previous year, while the Asia-Pacific region grew the slowest at 15%, bringing the total number of IXPs to 67. Africa is the region with the fewest IXPs (only 17 of the 53 nations have them) and growth was only 21% over the previous year. IXPs are not expensive to establish - it is estimated that about USD 40 000 would fund the establishment of an IXP. Although some countries have regulatory barriers or onerous licensing requirements for IXPs, the main restraint on establishing them is the lack of human technical capacity within the staff of Internet providers to implement an IXP in developing countries. As a result, continuing efforts will be needed for capacity building in inter-networking skills.

The deployment of local domain name servers also helps reduce demands for international bandwidth as well as improving reliability and responsiveness for users because domain name queries do not have to travel over slower international links. The technical design of the top-level (root) domain servers limits them to 13, most of which are concentrated in the US[30]. However, mirror servers (copies of the 13 main servers) are now being deployed all over the world. By mid-2007, there were more than 130 mirror servers available in 53 countries, including a number of developing and middle-income countries - Argentina, Bangladesh, Brazil, Bulgaria, Chile, China, Colombia, Equador, India, Indonesia, Kenya, Malaysia, Pakistan, Panama, Qatar, Philippines, South Africa. ICANN makes the decision about where to locate mirror servers based on technical and institutional host assessments. Mirror servers are often located at IXPs, and are not costly to set up, but they need relatively large amounts of reliable bandwidth, which can be problematic in some developing countries.

III. E   Technical Trends – Convergence, NGNs & IP Resources

Since the beginning of the century, telecommunication networks have begun to move from primarily voice-oriented networks to primarily Internet-oriented networks. In 1999, operators in the US began to report that they were carrying more data than voice traffic, and by 2007 the Internet was responsible for about 75% of all international capacity. Internet traffic increased by 50–60% in 2007, climbing to between 3000 and 5000 PetaBytes[31] (a million Gigabytes), while international voice traffic increased by 13% in 2007 to 338 bn minutes. The proportion of non-voice traffic is likely to become even greater with the growing adoption of Internet TV (IPTV) and radio, gaming and local peer-to-peer (P2P) file sharing. IPTV in particular requires more bandwidth than almost any other widely used application. While largely confined to developed countries, some middle-income countries are also beginning to deploy IPTV services. The number of IPTV subscribers worldwide in 2007 was about 7.5 mn[32], with Europe having the largest population of users; forecast to grow from approximately 6.4 million in 2007 to 30.4 million in 2011. A number of companies are planning to launch IPTV, but are waiting for regulatory reform to allow Internet providers to offer pay-TV services. Spanish telecom operator Telefonica is hoping to launch IPTV in Chile, Argentina, and Brazil, where it could replicate the service it already offers in Spain. In addition, by 2007 more than 120 mobile network operators worldwide had rolled out commercial mobile TV services, including some in developing countries.

---

[29]   http://www.pch.net
[30]   10 root servers are based in the US, one in Tokyo (WIDE), one in Stockholm (NORDUnet) and one in London (RIPE).
[31]   http://www.dtc.umn.edu/mints
[32]   http://www.fierceiptv.com/story/iptv-middleware-breakdown/2007-09-25

The emergence of Internet protocols as a more efficient means of carrying both voice and data has resulted in steadily increasing transition of network infrastructure to purely Internet based platforms. Most developed country and many developing country operators are now moving to these Next Generation Networks (NGN) because they are less costly to deploy and maintain than the older switched networks. As a result, they are more able to cost-effectively provide bundled services, in particular the 'triple-play' of telephony, Internet and radio/television over a single broadband connection. An EU survey[33] showed that 29% of households in 2007 had subscribed to at least one bundled service, up from 18% the previous year. One of the largest NGN equipment manufacturers, Juniper, announced in late 2006 that it had more than 100 customers. This convergence is also being augmented by fixed-mobile convergence (IMS) where operators provide a single phone, which uses the fixed connection when at home or the office, and the mobile network when elsewhere.

The use of VoIP is steadily increasing, often used by telecom operators on their international routes, but also by the end-user via the PC, as well as via dedicated VoIP handsets linked to broadband, and on mobile 3G networks. While growth of VoIP has been significant, overall, traditional switched networks still dominate the voice market, even in developed countries. For example, a 2007 survey[34] found that VoIP comprised 14% of overall fixed traffic in France, 6.3% in Austria and 5.6% in Slovenia. In developing countries, lack of broadband infrastructure and regulatory restrictions on use of VoIP have further limited its uptake, but where it is available, it is often heavily used for international calls due to the substantial cost-savings.

The move toward converged networks has coincided with increased demands for higher bandwidth, leading to much greater use of fibre optic cable connecting directly to the end-user. Known as fibre-to-the-home (FTTH), the technology currently accounted for about 20 million connections[35] in 2007. This is expected to expand especially quickly in developed parts of Asia where 54 million FTTH-connected households are expected by the end of 2012, followed by Europe/Middle East/Africa with 16 mn, and North and South America with 15 million. Because of the very high capacities and relatively low cost of operating this infrastructure, charges for making voice calls is effectively tending toward zero, and are simply being rolled into a relatively small flat monthly fee for a basket of telephony, Internet and broadcast services. VoIP operator Skype already provides unlimited calls to landlines in 34 countries for about EU 7 / month. For the moment, the co-existence of NGN networks with the older PSTN model, has led to some irregularities in the market, in particular, international calls to a mobile number often cost 5 or 10 times as much as calls to a fixed line in the same country.

The growth of the Internet combined with the migration of traditional networks to the Internet is beginning to put strain on the current version of the Internet protocol (IP), which is based on version 4 (IPv4) addressing. The design of the protocol more than 20 years ago did not anticipate the huge growth of the Internet and is limited to 4 bn addresses. The free pool of addresses in 2007 had only about 0.7 bn addresses left[36], and depending on estimates of Internet growth rate, is expected to fully deplete between the second quarter of 2011 and the third quarter of 2012. In mid 2006, the global authority for IP allocation, ICANN, finalised its allocation policy for the next generation of the addressing protocol

---

[33]   http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/582
[34]   http://ec.europa.eu/information_society/doc/factsheets/13thimplementation/9-28-consumer.pdf
[35]   http://www.teleclick.ca/2008/02/worldwide-ftth-broadband-market-to-grow-30year-through-2012
[36]   http://www.nic.ad.jp/en/ip/ipv4pool/ipv4exh-report-071207-en.pdf

(IPv6), and equipment capable of handling the new protocol has been available for some years. However, there has been inertia on the part of operators and software developers in adopting the new protocol, partly because of the need to upgrade equipment and skills. A particular issue is that many national domain name servers, especially those in developing countries, have not yet upgraded to IPv6.

There were more than 153 million domain name registrations[37] worldwide at the end of 2007 across all Top Level Domains (TLDs). China (.cn) now has the second largest country domain, after Germany (.de), while Argentina (.ar) and Brazil (.br) are also among ten largest country domains. The global market has seen increasing growth rates over the last five years and the total number of domain names grew at a rate in excess of 30% per annum in 2007 compared to 10% in 2002. Among the key reasons for this rise is the growing recognition of the importance of an online presence, coupled with the increased global uptake of Internet access and broadband technology. This upward trend is expected to continue, at least in the short term, with growth in the first half of 2007 standing at more than 35%. Although domain name uptake is affected by ease and speed of registration, as well as price, awareness and levels of Internet access, registrations also correlate closely to GDP. A number of countries have significantly more domains than could be predicted by GDP levels. In particular, the Netherlands ranks 4th in domain name volume but 16th in GDP, and Argentina ranks 7th in domain name volume and 31st in GDP. On the other hand, Japan, Canada and France under-perform in registrations versus GDP. Over the past 6 years, there has been steady growth in the China domain, (.cn,) and during 2007, there was heavy price discounting with registrations available for under USD 50 cents. This resulted in a phenomenal growth rate of 241% for the first 6 months of 2007.

The availability of domain names in local language scripts has also limited uptake in countries with non-latin scripts, but this problem decreased substantially in 2007. It is now possible to register Internationalised Domain Names (IDN) names with 43% of the registries.

At present, very few new top level domains have been issued, but ICANN is now completing policies for registration of new generic TLDs (gTLDs such as the .aero .eu and .mobi) that were registered earlier on an experimental basis. The new policy is likely to greatly increase the number of top level domains, for example, to allow city gTLDs, such as .berlin or .nyc.

III. F   Trends in Applications

The explosion in mobile telephony has underscored the fact that voice communications is still, and is likely to remain, the most important ICT application. This is especially apparent in developing countries where the cost is a much higher proportion of income, compared to that in the developed economies. Until the Internet in developing countries becomes more widespread, the use of mobile phones is likely to have the most development impact in the short-to-medium term[38]. This is being reinforced by the use of text messaging and other low-bandwidth text-based services that are now available on mobile networks, for example banking, payments, trading and news or market information. Ring tones, digital photography and other mobile phone applications, such as e-mail, have also become increasingly popular.

---

[37]   http://www.circleid.com/posts/83609_total_domain_names_registered_2007
[38]   The impact of telephony on the bottom of the pyramid is demonstrated in Laos PDR where a study found that 80% of users earned less than 1 dollar a day. Their phone use focuses on contact with family members and information on government issues and by substituting one trip per month by a phone call, it was found that the poor were generating an average surplus of USD 77 per year. http://www.lao.net/html/ICT/conf01soonsong.htm.

Also of significance is the use of mobile phones by the public and NGOs for obtaining information from peers and organizing responses to information ranging from traffic blockages to political strife and natural disasters. These activities are now being augmented by interfaces to web sites, such as Twitter, which allow a single text message to be sent to thousands of recipients. Information on the unrest and violence that followed the 2007 elections in Kenya, continued to be disseminated via the Internet even after the government imposed a media blackout. Kenyans, unable to reach Internet cafes, were able to stay connected with each other and the rest of the world using SMS messaging available on the Mashada Web site, which caters to African online communities.

A global survey by the United Nations Foundation and the Vodafone Group found in 2007 that 86% of non-governmental organisation (NGO) employees use mobile technology in their work, and 25% believe it has revolutionised the way their organisation or project works. While the most common uses of mobile technology cited by NGO workers were voice calls (90%) and text messaging (83%), more sophisticated uses, such as mapping were cited by 10%, data analysis 8% and inventory management 8%, were also reported.

In terms of volumes of data, video content now uses the largest proportion of bandwidth on the Internet. In 2007, by one estimate[39], the video sharing site, YouTube, consumed as much bandwidth as the entire Internet did in 2000. It is also estimated that digital traffic on the global network is growing at about 50% a year. The amount of data available on the Internet in 2007 was 281 exabytes[40] (281 billion gigabytes), about 10% larger than earlier predictions because of faster growth in digital cameras, digital TV, and better information replication techniques. By 2011, it is expected that the digital universe will be 10 times the size it was in 2006. The fastest growing areas include those related to digital TV, surveillance cameras, Internet access in emerging countries, sensor-based applications, data-centers supporting "cloud computing," and social networks.

Creation of Internet-based content and applications in developing countries continues to lag the rest of the world because the number of users online in many of these countries is often insufficient to justify the cost of developing the service[41]. And without more universal access, manual services must be maintained in parallel to online services, increasing the overall cost of using ICTs, rather than decreasing it. Aside from lack of infrastructure, the lack of information services in local languages has also slowed the uptake in developing countries. According to most sources, English-language web sites accounted for between one-half and four-fifths of all Internet content[42] in 2007. Virtually all online content (upwards of 95%) is in a limited group of languages consisting of English, other European languages, Chinese, and Japanese. Major linguistic groups, especially those in Africa, are barely represented in the medium.

Limited financing, especially by government, and lack of investment capital for local application developers has also been a barrier to increased creation of online content in developing countries. To

---

[39]   http://message.snopes.com/showthread.php?t=27283
[40]   http://www.infoniac.com/hi-tech/amount-digital-information-reached-281-exabytes.html
[41]   Global or regional services that appeal to larger pools of users have seen greatest expansion to date.
[42]   http://www.terabitconsulting.com/public/downloads/Terabit%20Consulting%20-
%20Undersea%20Cable%20Markets%20and%20

address this, Public Private Partnerships (PPPs) are increasingly being seen as necessary to stimulate the supply of local e-content.

As a result of the slow development of e-services, very few comprehensive global assessments of the use of online applications have been made. Those that are available generally cover developed countries. However, these still provide broadly useful data for identifying best practices and opportunities to build on existing open source applications.

III. G   Trends – Social Network Services & User Provided Content

Online social networking and services based on user-provided content (often associated with Web 2.0 applications) have recently become among the fastest growing areas of the Internet, and the biggest consumers of bandwidth. Services, such as My Space, Facebook, Friendster, Wikipedia, YouTube, Bebo and Orkut have had explosive growth in the last 2 to 3 years. In 2007, it was estimated that Wikipedia, the free, volunteer-created encyclopedia, now has more than six million articles in more than 250 languages, YouTube hosted 15 million video streams a day and an estimated 1 bn songs in MP3 format were shared daily via P2P networks. By some estimates, file sharing consumed 60% of Internet traffic[43] in 2007, although this varies widely from as little as 10% to as much as 70% depending on operator's customer base and geographic coverage.

Social networking sites often make the location of their users public, which provides useful data on the uptake of these services by developing countries. A recent study[44] of seven major social-networking sites found that Tagged and Hi5 had the most "balanced" user bases worldwide. Tagged had 23% of its base from North America, 15% from Latin America, 23% from Europe, 10% from Africa and the Middle East, and 29% from Asia and the Pacific region. Hi5, similarly, is 15% North American, 24% Latin American, 31% European, 9% African/Middle Eastern, and 21% Asia-Pacific. MySpace and Facebook both have large percentages of their users in North America (62% for MySpace, 68% for Facebook), with sizeable portions in Europe (25% for MySpace, 17% for Facebook), and single-digit numbers in all other regions. Orkut, has most of its users in Brazil and India, with almost half its user base in Latin America and the remainder in Asia-Pacific. Friendster leans the most disproportionately toward a single geographic market: it gathers nearly 89% of its user base from the Asia-Pacific region.

Online fund-raising and micro-lending for developing countries is now starting to become significant, having benefited from development of social networking tools. RealityCharity, for instance, invites organisations and individuals to raise funds by posting appeals and then using social networking tools on its site, including Facebook, Twitter, StumbleUpon, and Slashdot, to spread the word to potential donors. Money raised through RealityCharity is disbursed electronically to fund-raisers, without a middleman. Two of the biggest services, Firstgiving in the US and its UK counterpart, Justgiving, work only with charities and nonprofits based in the US and the UK.

There are also other applications of social networking systems that have been adopted by the private sector, such as the Elephant Design website in Japan, which involves consumers in advising companies how to make better products. It currently claims that six out of 10 of one leading Japanese retailer's top-selling products have been developed through the site.

---

[43]   http://www.peerapp.com/Data/**File**s/Accelerating_the_Video_**Internet**_PeerApp_Ltd_January_2008.pdf
[44]   http://www.researchrecap.com/index.php?**tag**=social-networks&paged=2

III. H Trends - Energy and Environment & ICT for sustainable development

The impact of human activities on the environment – and on climate change in particular – became a major issue in 2007. It is estimated that the IT-industry is responsible for about 2% of the global carbon footprint[45] created by human activities. As a group, their overall emissions are at the same scale as industries such as airlines, and data centre greenhouse gas emissions are expected to quadruple by 2020.

With advances in capacity of fibre optic cable, increased energy costs and mounting concern over carbon emissions has meant that it has now become more efficient to ship data around the world than it is to ship electric power to the data centres. With the massive capacities available on optic fibre, there is no need to host data centres close to the users. As a result, increased backbone infrastructure is consolidating more closely around sources of power generation to host bigger data centres which will minimise the effects of inefficiencies in power transmission and maximise economies of scale in the provision of hosting services[46]. One of the world's first zero-carbon data centres has been built in Cheyenne, US, which takes advantage of natural cooling because of its location in the northern US. Several more of these zero-carbon data centres are being deployed around the world, such as Bastionhost.com in Nova Scotia. It is also expected that the introduction of more energy-efficient ICT devices and networks, as well as their environmentally sound disposal will reduce the current impact that ICTs have on the environment.

On the other side of the coin, the use of ICTs is reducing energy requirements significantly in the economy through increased use of telecommuting, home-entertainment and better supply chain and production efficiency. At a recent ITU conference in Kyoto on ICTs and Climate Change, it was demonstrated that it is possible for Japan to reach 90% of it Kyoto target to reduce CO_2 emissions (68m tones) through application of ICT to various everyday activities. Naturally, these strategies are at present likely to have much more impact in the much higher energy consuming North. In contrast, the priority of developing countries is to increase basic energy supplies. For example, currently 1.6 bn people worldwide lack access to electric power[47] and only 15% of Sub-Saharan Africa rural households have electricity. Perhaps fortuitously, the lack of pervasive electricity grids in developing countries provides an additional incentive to explore renewable, low carbon footprint energy sources. One of the most promising recent developments has been the use of an alternate to silicon for photovoltaics. Dye sentisitised solar cells, known as "Graetzel cells" are made of low-cost materials and do not need elaborate apparatus to manufacture[48].

New business models for the production of energy are also being developed. Last year, UNIDO launched a project in Kenya to establish 'energy kiosks', which are small enterprises that make money from selling a local energy source, often renewable. UNIDO's focus has been on nurturing these kiosks around very small scale hydroelectric projects, biogas-driven generators, solar panels and generators that use vegetable oil (biofuels). Of particular note is the linkage between ICT and electricity access, and in areas with neither of these, there are strong arguments for providing them in an integrated fashion at the same time. These dynamics were built on in the UNEP and UN Foundation supported initiative eCARE. It was conducted in Ghana, which is accelerating the extension of clean energy and modern

---

[45]   http://news.zdnet.com/2100-9584_22-6180528.html

[46] Google already locates its data centres close to power stations where it can, and in one case in the Netherlands, resurrected a mothballed powerplant to host one of its European data centres.

[47]   http://www.adbi.org/.../utility.regulation.in.developing.countries.the.**electric**ity.and.water.sectors

[48]   http://www.g24i.com

telecommunications services to rural and peri-urban users in the country. The project helps small entrepreneurs establish rural business centres (RBCs) that sell voice telephony, Internet connectivity, clean energy products and services.

Another environmental aspect of ICTs is the waste created by broken and obsolescent equipment. Electronic waste is already accumulating at more than 1 bn units[49] a year — mostly mobile phones, but also personal digital electronics and PCs. UNEP estimates that as many as 50 million tonnes of e-waste are generated worldwide each year, and increasing at a rate of 3 – 5% per year (faster than any other category of waste). The switch to digital TV is expected to increase this rate substantially over the next few years because many more analogue TV sets, obsolete set-top boxes and DVD players will need to be replaced. As a result, electronic waste is expected to double by 2011.

Not only does increased consumption of products, such as computers, cell phones and telephones generate substantial e-waste, but it also places a heavy burden on natural resources due to the quantities of water and energy used for producing these devices, not to mention the energy consumed during their use. A recent study reveals that the production of a single desktop computer and standard monitor consumes the same amount of fossil fuels and water as the production of a medium-sized car.

Ironically, although the majority of e-waste is generated in the industrialised countries, much is transferred to developing countries, where environmental regulations and treatment capacity are significantly weaker. In the absence of adequate infrastructure, e-waste is commonly burnt in open air, dropped into bodies of water, or dumped in land fills, releasing toxic substances, which contribute to air, water, and soil pollution and accompanying health problems.

Awareness campaigns are increasing consumers' knowledge of e-waste and influencing what they purchase, and how they dispose of old technology, however regulatory intervention is also taking place. The European Union's new RoHS Directive, which bans new electrical and electronic equipment containing more than established levels of certain hazardous substances from the market, seeks to address the problem of e-waste at its source. The recent upgrade by ECE of the Aarhus Clearing House website[50] may also contribute to better consumer knowledge and political action.

---

[49]   http://newsinfusion.com/video_details.php?videoId=143
[50]   http://aarhusclearinghouse.unece.org/

PART 2 Summary of WSIS Implementation by Action Line and Themes

IV. Implementation of Action Lines (ALs)

The activities listed below cover regional and international initiatives related to the implementation of WSIS outcomes for the period February-March 2007 to March-April 2008. Except for some items listed for illustrative purposes, the listings do not generally include national initiatives, as the mandate of the CSTD on WSIS follow-up does not cover national implementation. Geographic regions are classified according to the United Nations regional commissions. The text clusters international and regional activities under the 11 the Action Lines, as adopted in the Geneva Plan of Action[51].

C1. The role of public governance authorities and all stakeholders in the promotion of ICTs for development

The UN Department on Economic and Social Affairs (DESA), in collaboration with the Inter-Parliamentary Union (IPU), and the Global Centre for ICT in Parliament, organised the World e-Parliament Conference in Geneva in October 2007. The Conference brought together for the first time, members of parliaments, Secretaries General, IT professionals and other parliamentary staff from around the world to address the promises and challenges of ICT in parliament. In collaboration with the Global Centre for ICT in Parliament, the Global Network of IT experts in Parliament was launched along with an online knowledge platform for exchanging information on the use of new technologies to strengthen parliamentary institutional and organisational capabilities. The Global Network now has 165 members from 65 countries.

In February 2008, DESA, IPU and the Global Centre for ICT in Parliament, published the World e-Parliament Report 2008 to establish a baseline of how parliaments are using, or planning to use, ICT. The Report also outlined good practices and lessons learned from different regions of the world based on a survey in which 105 assemblies from around the world commented on the use of ICT in parliament between July and November 2007. The Report also outlined good practices and lessons learned from various world regions and draws on experiences exchanged during the World e-Parliament Conference 2007.

The partnership between UNDP and Cisco to support bottom-up citizen-centric approaches to using ICT in governance expanded its efforts to develop an e-governance framework in 2007, extending its research to Mexico and South Africa, following initial public surveys in Brazil in 2006. The partnership also plans to develop toolkits with the involvement of stakeholders from developing countries which will provide a methodology on propoor e-governance programming that will include relevant indicators, case studies, and good practices.

The World Bank hosted a meeting in Washington on e-Government portals in May 2007. The event focused on the best practices and lessons learned from some of the worlds leading government e-portals and on-going e-Government operations financed by the WBG in Vietnam, Sri Lanka, Ghana, Rwanda, Romania, Morocco and Tunisia. The E-Development Thematic Group of the World Bank hosted a seminar in May 2007 on Open Systems for e-Government – Open Source, Open Standards and Open

---

51   Available on the home page of WSIS, at http://www.itu.int/wsis/index.html

Document Format. The event aimed to consider the technical and political issues for developing countries to take full advantage of the open source movement.

UN-Habitat is continuing to support its 1,000 Cities Geographical Information Systems (GIS) Programme which offers GIS software and related training packages to 1,000 institutions such as local authorities, and other urban development stakeholders. The package includes modules on how to monitor and analyze urban information, and translate these results into local policy. In 2007 UN-Habitat announced it had converted its popular training modules into a web-based online training programme accessible to local governments around the world as part of its global programme for strengthen training institutions in the area of urban planning and management. The web based training will be expanded to include other subjects relating to sustainable urban development.

In June 2007 USAID sponsored the annual seminar hosted by dot-ORG in Washington on "e-Government for Development: Strategies and Policies" – a two-week event that included lectures, panel discussions, and interactive workshops presented by leading e-Government experts from a variety of organisations. The 2007 event brought together senior level officials from 14 countries in a course that focused on connectivity opportunities in each of their countries.

Africa
Following on from establishing the Global Network of IT experts in Parliament (see above), under the Africa i-Parliaments Action Plan, DESA is preparing to establish an African Parliamentary Knowledge Network (APKN). It will be a mechanism for coordination among parliamentary administrations in their various areas of responsibility, including legislation, information, research, documentation and technologies. The APKN was discussed among members and officials from twelve parliamentary delegations from African assemblies and the Pan-African Parliament at a African Legal Resources conference hosted by the National Assembly of Nigeria in Abuja in March 2007. The Conference agreed on the establishment of the APKN to promote the training and capacity building of members of parliaments and parliamentary staff in the areas of legislation, information & research and ICT. Seventy-seven participants from 15 countries took part in the deliberations of the meeting. The work builds on lessons learned, and applications developed during the implementation of the initiative "Strengthening Parliaments' Information Systems in Africa", including AKOMA NTOSO[52] (Architecture for Knowledge-Oriented Management of African Normative Texts using Open Standards and Ontologies), and Bungeni – the Parliamentary and Legislative Information System is solution for managing and publishing legislative and other parliamentary documents[53]. A Charter of the African Parliamentary Knowledge Network, outlining membership, governance, secretariat services and funding, is being prepared under the auspices of the Abuja Conference co-organisers, in consultation with representatives of parliaments from the Africa regions.

A workshop on ICTs, Gender and e-Government took place in Mozambique in May 2007, organised by ECA, in cooperation with the Mozambican Ministry of Science and Technology, the Canadian e-Policy Resource Centre (CePRC) and the Open Society Initiative for Southern Africa (OSISA). Over 30 participants from 18 Anglophone countries composed of ICT focal points and representatives of gender organisations attended (the first workshop was held in Tunisia in June 2006 for Francophone countries).

---

[52] http://www.akomantoso.org
[53] http://www.bungeni.org

The outcome of the workshop was a framework for a Pan African Action Plan for ICTs, Gender and e-Government[54].

In collaboration with the SADC Parliamentary Forum and the ECA, a four-day MPs forum on "Building an inclusive Information Society in the SADC Region" took place in February 2007.

In June 2007 the Local Governance and ICTs Research Network (LOGIN), held its fourth annual workshop in Mauritius supported by IDRC and CAFRAD. The participants discussed local government and ICTs, heard presentations from nine African countries and concluded that although there were some promising pilots, no large-scale roll-out had taken place yet. As a result there was little evidence of the effects of ICTs on local governance which could inform national e-governance policies. Based on the work of LOGIN, in 2007 IDRC published a handbook on ICTs for local governance entitled "e-Governance in Africa – From Theory to Action".

Asia and the Pacific
UNDP-APDIP, in partnership with IBM and Oracle, held the Government Interoperability Frameworks (GIF) Workshop and Study Group Meeting in Beijing in April 2007, hosted by the Chinese Government's State Council Informatisation Office (SCITO). These meetings brought together governments from 15 countries to share worldwide experiences on GIF formulation, implementation and revision. UNDP's support for the GIF Study Group, comprised of government officials from 14 Asian countries and culminated in the publication of the e-Primer on e-Government Interoperability, launched in December 2007 at the GK3 event in Kuala Lumpur. The publications aim to provide a roadmap for e-government interoperability, based on flexible, universally compatible technologies for good governance and achievement of the Millennium Development Goals[55].

UNDESA organised the 6th Annual Forum on City Informatisation in the Asia Pacific region October 2007 in Shanghai. The forum provided a platform for policy and decision makers of municipal governments in the region to discuss the development of the information industry and the applications of information technology.

The APEC Economic Committee (EC) is discussing the use of ICTs in government as part of the EC's program for structural reform. Aimed at raising awareness of the role of ICT as an enabler for good public sector governance, a workshop on e-governance in was held Lima in February 2008. In the subsequent EC workshop on Government Performance and Results Management (WGPRM) in New Zealand in March 2008, demonstrations in the use of ICT in the Public Sector Governance took place. Discussions covered three key areas: e-administration for better accountability, e-services for better efficiency and transparency; and e-participation by citizens, for better policy making. The event highlighted the close linkages between e-governance and good governance and follow-up planned includes opportunities to engage the private sector and intensifying technical training.

In November 2007, the Asian Development Bank published its e-Asia and Knowledge Partnership Fund annual report. The fund, which is supported by the Government of Korea will support four projects: (1) Hazard Risk Assessment Using Geo-Information Technology (Viet Nam); (2) Business Process Reengineering and Change Management for Tax Administration Modernization (Kyrgyz Republic); (3)

---

[54]   http://www.epolafrica.org/gender-ict
[55]   http://www.apdip.net/projects/gif/gifeprimer

Implementation Support for the Computerization of the National Bank of Cambodia (Cambodia); and (4) Preparing the South Asia Subregional Economic Cooperation (SASEC) Information Highway Project (see below C2).

Latin America & the Caribbean
In addition to the APEC e-government activities referred to above, in Santiago in September 2007, ECLAC held an e-Government interoperability meeting attended by two-dozen governmental and non-governmental experts who provided inputs for the regional strategy that was subsequently launched in February 2008 – eLAC2010.

In its efforts to build up local capacity in e-government, the OAS office of the Executive Secretary (SEDI) signed agreements in 2007 with the Instituto Geográfico Agustín Codazzi (IGAC) in Colombia and Centro Nacional de Registros (CNR) in El Salvador to train over 200 public officials in e-government. The training will use its on-line training course in e-government from which, to date, nearly 2,000 officials from 32 countries in Latin America and the Caribbean have graduated. The course is imparted in Spanish, English and Portuguese, and graduates are included in a virtual collaboration and exchange mechanism called the "OAS e-Government Forum".

The Network of e-government leaders of 32 Latin America and the Caribbean countries[56] (Red GeALC) held its annual meeting in May 2007 in Santo Domingo. RedGeALC encourages the use of ICTs as tools to improve the public sector's efficiency and transparency by learning from past lessons, best practices, and solutions of e-governance programs already established or in development. Red GEALC emerged from regional e-governance activities organized by LAC governments, in partnership with the OAS and the IDRC.

In Oct 2007, USAID began the Peru Connectivity project, aiming to improve the transparency and efficiency of local municipal governments by helping them to adopt the Government of Peru's software for financial management and procurement, and to solve related issues – a lack of access to the Internet and lack of facility with computing – in a way that proves to be economically sustainable.

Western Asia
ESCWA held an on-line workshop on e-government policies and strategies, in early 2007 to help formulate and implement e-government strategies in the ESCWA region. It highlighted best practices of e-government applications in the developed countries, institutional dimensions of e-government strategies and policies, and discussed monitoring the progress and measuring the impact of e-government applications. In 2007 ESCWA also cooperated with national/regional agencies on e-government implementation in: (i) UAE (Dubai School for Government) on regional activities; (ii) Syria through participation in the First e-Government Conference with the Ministry of Communications and Technology; (iii) Iraq through delivering a series of lectures on e-Government awareness to several groups of middle managements from the Ministry of Municipalities and Works.

C2 Information and communication infrastructure
As the focal point in the UN for ICT infrastructures, the ITU has assisted with a wide range of initiatives in this area, including: comprehensive research work on the ICT broadband infrastructure in Africa and the Connect Africa Initiative (see below), capacity building activities on ICT policies and

---

[56] http://www.redgealc.net

applications, and satellite diversity in the Pacific Island s. Current standardisation work is focusing on Next Generation Networks (NGN), with the approval of specific standards on signalling protocols, security, multimedia services over NGN, fixed-mobile convergence, service level requirements and architectural framework to provide new services based on Internet Protocol Television (IPTV). Charging and accounting principles for NGN (including related telecommunication economic and policy issues) continue to be studied series of forward-looking conferences on standardisation issues related to NGNs[57].

In October/November 2007 the World Radio Conference was held under the auspices of the ITU in Geneva. Recommendations approved include the facilitation of access to the orbital/spectrum resources and related applications for a broader range of users.

In March 2008 the United Nations Foundation and The Vodafone Group published Wireless Technology for Social Change: Trends in NGO Mobile Use[58]. The report examines innovative uses of mobile technology by groups working to achieve the UN Millennium Development Goals. The report identifies emerging trends in "mobile activism", humanitarian assistance and environmental conservation through 11 case studies, and highlights the results of a global survey of NGO usage of mobile technology.

In February 2007, Indian telecom operator Reliance Communications approved USD 1.5 billion in finance for its Next Generation Network project which will almost double the size of its global undersea cable system to 115 000 kilometres by 2009, and land in 60 countries, comprising 80% of the world population.

In early 2008, a submarine cable disruption occurred[59] which involved damage of five high-speed Internet submarine communications cables in the Mediterranean Sea and Middle East causing internet interruptions and slowdowns for users in the Middle East and India. Cable disruptions are not uncommon (more than 50 repair operations were mounted in the Atlantic alone last year), but while a cut in a cable crossing the Atlantic has little significant effect due to the many alternate cables, only a handful of Internet cables serve the Middle East. Nevertheless the event served to highlight the vital importance of maintaining reliable international fibre connectivity and raised awareness of the need to ensure that multiple physically independent links are needed for every country in today's Information Society.

Africa
A large number of international agencies have been collaborating to address the lack of ICT infrastructure in Africa, which culminated in the Connect Africa Summit in Kigali in October 2007. The Summit gathered some 1036 participants from 54 countries, including six Heads of State and Government. Forty-three countries in Africa were represented, including 23 at the Ministerial level. Some 20 industrial leading companies also participated, along with development banks, international organizations and other stakeholders. The Summit closed with investment commitments of over USD 55 billion from private and public sector stakeholders, to be spent over the next five years, in support of the five goals adopted by the Summit. These goals aim at interconnecting all African capitals and major

---

[57]   http://www.itu.int/ITU-T/uni/kaleidoscope/

[58]   http://www.unfoundation.org/vodafone/communications_publication_series.asp

[59]   http://en.wikipedia.org/wiki/2008_submarine_cable_disruption

cities with ICT broadband infrastructure and strengthen connectivity to the rest of the world by 2012, and connecting all African villages to broadband ICT services by 2015. They also aim at adopting regulatory measures that promote affordable, widespread access to a full range of broadband ICT services, supporting the development of a critical mass of ICT skills, and the adoption of national e-strategies, with the aim of making multiple e-government and other e-services widely available by 2015[60].

As part of the Summit several flagship partnership and advocacy initiatives aimed at accelerating connectivity and access in Africa were launched in 2007 by agencies including the ITU, GAID, the World Bank Group, the European Union, the UN Economic Commission for Africa (ECA), the Commonwealth Telecommunication Organisation (CTO), the Global Digital Solidarity Fund (DSF), the African Union, NEPAD, the African Development Bank (AfDB), the African Telecommunication Union (ATU) and the regional economic bodies COMESA, ECOWAS, SADC and EAC. Of particular note was the announcement at the Summit by the World Bank that it is prepared to double previous financing commitments over the next five years and provide up to USD 2bn for ICT infrastructure development in Africa.

In particular, NEPAD's e-Africa Commission has proposed a NEPAD Broadband Infrastructure Network (NBIN) for the continent that would ensure that every country on the continent is linked by at least two international fibre connections. The ITU and the AfDB also agreed to work together on interconnecting all African capitals and major cities with broadband infrastructure and on strengthening connectivity to the rest of the world by 2012. At the Kigali Summit the AfDB announced it had approved a multimillion dollarloan for the East African Submarine Cable System (EASSy) which aims to establish a fibre backbone along the world's largest unconnected coast, running between South Africa and the Sudan, with six landing points along the way (see below). Also, France Telecom and its subsidiary mobile operator, Orange, announced in March 2008, plans to install a submarine cable known as Lion which will connect Madagascar to the rest of the world via the islands of Reunion and Mauritius. In addition other similar competing private projects have emerged, such as SEACOM and FLAG, and on the west coast of Africa new fibre projects are also being announced. These activities have served to underline the growing recent interest in investing in African telecommunication infrastructure.

To coincide with the Connect Africa Summit, the Association for Progressive Communications (APC) convened a civil society workshop in Kigali on Open Access to ICT infrastructure in Africa. Participants highlighted the important role of private investment and public private partnerships for developing ICT infrastructure, calling for new forms of corporate governance that would ensure the interests of all stakeholders, but especially, the interest of African consumers and citizens. They encouraged governments to support harmonisation of policy and regulation by adopting regional instruments and structures to manage and support the development and implementation of cross border connectivity. They observed the need for greater participation of recipient communities in access initiatives and for transparency in the selection of Universal Access projects.

In 2007 implementation of the East African Submarine Cable System (EASSy) began. The fibre-optic cable project will connect 22 coastal and landlocked African countries with each other, and the rest of

---

[60]   Most notably Mobile operators of the GSM Association, the World Bank, European Commission, the African Development bank, ITU, the Governments of Rwanda, Tunis and Spain.

the world by 2010. The $235 project million, is financed by a consortium of telecom operators with loan financing of USD 70.7 million from the AfDB, the French development Agency, the European Investment Bank, Germany's Development Bank (KfW) and the International Finance Corporation.

An EU Trust Fund for Africa of about 100 million Euros in grants and some 260 Million Euros for loans was been established along with the European Investment Bank and ten EU member states for the period 2007-2008. The fund, which will be substantially replenished at the end of 2008, will finance cross-border projects or national projects with a regional and continental impact that would include ICT. The Commission also announced a contribution of Euro 6 million to support ITU's regulatory reform initiatives in Africa.

In October 2007 at the Connect Africa Summit the African Development Bank (AfDB) announced it had scaled up its investments in infrastructure, and expects to apply 60% of its concessional resources on infrastructure, including ICT, in the next three years. AfDB also committed close to USD 65 million to two key regional ICT projects: RASCOM and EASSy.

In a January 2008 survey it was found that contracts totalling over USD1bn for at least 30,000 kilometres of fibre-transmission networks have been awarded by African operators during the last 18 months. Chinese vendors Huawei Technologies, ZTE, and CITCC won two-thirds of these projects, with financing provided by the Chinese Export Import (Exim) Bank.

In November 2007 the Commonwealth African Rural Connectivity Initiative (COMARCI) was launched by the Commonwealth Telecommunications Organisation (CTO). The project aims to collate all information about policies, regulations, technology and business models relating to rural connectivity, map connectivity in rural Africa so that gaps can be identified, identify the most successful connectivity initiatives, identify ten best-practice models for replication, and mainstream the COMARCI programme with relevant governments so that rural communications initiatives in each country can be included in national development agendas.

In June 2007, in a world first, all international and roaming charges were abolished for calls between users of mobile phone service provider Celtel. Operating in 14 African countries with a total population of nearly 400 million people in an area twice as large as western Europe, this would allow about half of all African mobile phone subscribers to communicate across national borders, without incurring extra costs.

The Africa Finance Corporation, a new private-sector led investment and development financial institution was established in 2007 to foster economic growth and industrial development of African Countries. It seeks to support and promote infrastructure and industry development in Africa through the provision of investment funds, to facilitate African trade and export-oriented trade by African countries and provide on-lending and refinancing facilities to African financial institutions. AFC has a large (USD1bn) capital base to support early and intermediate stage projects and access to cheap long-term funds through an anticipated investment grade rating.

The Regional African Satellite Communication Organisation[61] (RASCOM), with investment from GPTC of Libya and France's Alcatel Spacecom, launched the RASCOM-QAF communication satellite

---

[61]   http://www.rascomstar.com

in December 2007. The satellite can provide direct links between all African countries allowing operators to save the hundreds of millions of dollars paid out annually to operators outside the continent as transit charges for intra-African traffic. Unfortunately the satellite was affected by a helium leak shortly after launch, and although originally designed to last up to 15 years, the satellite may now only operate for about two-and-a-half years. However Rascom has plans to launch additional satellites. Nigeria also launched communication satellite, in May 2007, with a footprint in 38 African and five European countries.

The Wireless Africa[62] group was established by the South African Council for Scientific and Industrial Research (CSIR) in 2007 to research ways to develop sustainable access models for developing countries through community-owned decentralized mesh networks built on open source technology.

Asia and the Pacific
In September 2007, the US search company Google announced it plans to lead a consortium of telecom companies that is working on a new trans-Pacific undersea cable linking the US with Japan called "Unity". Trans-Pacific Internet traffic increased 41 percent between mid-2006 and mid-2007. To meet this growing demand, existing cables such as Pacific Crossing-1 and the Japan-US Cable system are being upgraded and two new cables, Trans-Pacific Express and the Asia America Gateway, are under construction and should be complete in 2008. The cumulative effect of these upgrades and new cables will be to boost trans-Pacific submarine cable capacity by 120 percent to 7.2 Tbps by the end of 2008.

In response to requests from Pacific leaders ESCAP conducted a study, in cooperation with ITU and the Pacific Island Forum secretariat on the role of a dedicated satellite system to connect less populated islands of Pacific countries. The Study was supported by the UN Office of the High Representative for Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States and the UNDP Office for South-South Cooperation and its findings will be presented to the Pacific leaders in 2008.

In December 2007, the Asian Development Bank approved a USD21.2 million Information Highway Project for the South Asia Sub-regional Economic Cooperation (SASEC) countries which will establish SASEC fibre-optic regional network to integrate member countries and reduce international Internet costs, particularly for the land-locked countries of Bhutan and Nepal. The project will also build the SASEC village network to expand broadband wireless connectivity to 110 rural communities and enable them to better access services such as telemedicine, distance learning, and e-government services. In addition, it will set up a SASEC regional research and training network to facilitate the flow and integration of information, knowledge, and services.

The Eighth Meeting of the Subregional Telecommunications Forum of the Greater Mekong Subregion Economic Cooperation Program (GMS) was held in Bangkok, Thailand on in May 2007 and co-hosted by the Ministry of ICT of the Royal Thai Government and the ADB. The meeting discussed the status of national and other developments in the development of the GMS Information Superhighway Network (ISN) and the development of the Telecommunications Backbone Project. In March 2008 phase 1 of the GMS Information Superhighway Network (ISN) was completed which will see the countries bordering the Mekong Delta connected with a high-speed fibre optic backbone.

---

[62]   http://wirelessafrica.meraka.org.za/wiki/index.php/Wireless_Africa_Home_Page

US operators Verizon and five Asian operators commenced building a USD 500 million undersea cable linking the United States to China which is expected to be in service in late 2008.The cable will have about 60 times the capacity of existing lines between China and the United States (1.28 TBps). Branch cables will also land in Chinese Taipei and Korea.

Vietnam' s telecom operator, EVN Telecom partnered with VSNL International in 2007 to invest USD 200 million in an undersea cable network, which will link major telecom hubs in Asia. The cable's initial capacity will be 320 Gbps, upgradable to 5.6 TBps and will link Singapore, Viet Nam, the Philippines, Hong Kong (China), Chinese Taipei, China, Japan and Guam.

PPC-1 is Australia's first cable connecting Australia to the global hub in Guam, providing onward connectivity to Asia and the United States. The cable will have a design capacity of 1.92Tb/s and is expected to be operational in July 2009.

ECE-Region
The European Union launched the second and final test satellite for its USD5.3-billion Galileo Global Positioning System in April 2008. The €3.4-billion project is due to have 30 satellites up and running by 2013 and is Europe's biggest single space programme, joining the US GPS and similar projects planned by Russia and China. The satellite will carry out testing of technologies such as a high-precision atomic clock and the transmission of navigation signals

Latin America & the Caribbean
In infrastructure and access, eLAC2010 includes goals such as: promoting the development of infrastructure in each country and in the region, fostering the deployment of traffic nodes, the installation of copies of root servers and local content hosting, with the object of improving the network's quality and stability and reducing access costs.

In June 2007 Flag Telecom, the undersea submarine cable arm of Indian telecom group, Reliance Communications, agreed with British virtual network operator Vanco to expand its network to South America and Australia.

Atlantic Tele-Network based in the US Virgin Islands announced in November 2007 an investment of USD35mn in a new cable to be completed in 2009 which will provide improved service to Guyana, Suriname and Brazil.

Western Asia
In October 2007 French telecommunication group Alcatel-Lucent announced it would lay the Mediterranean Sea segment of a new 3,850 km submarine cable network, named Middle East North Africa (MENA) for telecom operator Orascom. MENA will link Egypt, Italy and Saudi Arabia, delivering an ultimate capacity of 5.76 Tbit/s and aims to make Egypt a central hub for traffic transiting across Europe, Middle East and Asia.

C3 Access to Information and Knowledge

Increased access to learning, knowledge and technology transfers are seen as key elements needed to improve the economic development of low-income countries. Within this context there is now growing interest in the potential of using ICTs to improve access to digitised public domain materials, and in preserving cultural heritage.

At the same time there is a growing worldwide movement toward the promotion of freely available (open-access) education, cultural and science materials on the web. The most well-known examples being the initiative of the Massachusetts Institute of Technology (MIT) in 2003 to make all of its courseware freely available, and the Gutenberg Project, which, with its partners, had built up over 100 000 copyright-free books online by 2007. Many other open-access initiatives have emerged recently. In early 2008 the first 30,000 pages of the Encyclopedia of Life, covering the Earth's 1.8 million species, were put online with support from the MacArthur Foundation and the Alfred P Sloan Foundation. The intention is that the Encyclopedia will be a global knowledge resource "created by all, maintained by all and with benefit to all". The British Library has announced similar plans for its collections. In December 2007 the US passed a law requiring the US National Institutes of Health (NIH), which spends $28bn a year on research, to ensure its 10,000-plus researchers make research results available online. Harvard University is expected to do likewise. The Open Architecture Network was launched in March 2007 to allow the public to download 400 designs contributed by 6,000 architects. Designs include a solar-powered water harvester, an electricity generator and a composting toilet.

Open access to free software and its source code is also increasingly being seen as an important tool for development, not only to save licensing fees, but also to ensure security, compliance to open standards and to build local capacity in software development. In 2007 more countries established national government policies or initiatives to promote the use of open source software, including Cuba, Denmark, Ghana, Malaysia, Netherlands, Norway, Spain and Switzerland, the UK, South Africa. An August 2007 survey found a total of 268 open source government policy initiatives had been mounted worldwide since 2003. In February 2007 the European Union awarded USD 1mn to a consortium of 11 organisations to explore the use FLOSS as a development tool.

In its 2008-2013 Medium Term Strategy, UNESCO has singled out youth, least developed countries LDCs) and small island developing states (SIDS) for priority attention as these three areas are where the challenges are the greatest in providing access to information.

In 2007 UNESCO continued implementation of the Memory of the World Programme for the protection of documentary heritage, both analogue and digital, to encourage wider access to local content. In September 2007 it organised the thirteenth meeting of the Bureau of the Intergovernmental Council for the Information for All Programme (IFAP) in Paris, the objectives and activities of which closely align with those of WSIS. The Bureau decided to fund a global project on information literacy and agreed on a series of regional workshops on information literacy and information ethics.

Efforts to improve scientific information availability have resulted in the February 2008 launch of the Open Science Directory (OSD)[63] by the Intergovernmental Oceanographic Commission of UNESCO (IOC), with the support of commercial database provider, EBSCO, and Hasselt University Library. The

---

[63]   http://www.opensciencedirectory.net/

OSD aims to create a single access point to all on-line the journals contained in the many different programs for developing countries being currently provided individually by WHO, FAO, UNEP, eIFL, INASP and others. About 13000 scientific journals are now available in the 'Open Science Directory' and it is expected to contain more than 20,000 titles shortly.

The Fourth Session of the Provisional Committee on Proposals Related to a WIPO development agenda (PCDA) took place in Geneva in June 2007. The meeting considered recommendations for WIPO to play a role in helping developing countries and LDCs to gain improved access to technology and knowledge through the preservation of the public domain within WIPO's normative processes and to deepen the analysis of the implications and benefits of a rich and accessible public domain. The meeting also discussed proposals to negotiate a multilateral agreement where signatories would place into the public domain, or find other means of sharing at modest cost, the results of publicly funded research, proposals to examine non-exclusionary systems for fostering, creativity, innovation and transfer of technology (e.g., free software development and creative commons models), and to establish a Treaty on Access to Knowledge and Technology. The WIPO 2007 General Assembly resolved that discussion on the Development Agenda should be moved to the newly created Committee on IP and Development (CIPD), which held its first meeting in March 2008 in Geneva. The meeting recommended[64] the inclusion of activities that promote the fair balance between IP protection and the public interest, improving the quality of patent examination and facilitating accessibility to IP. Also, the African delegation requested that African countries be able to benefit fully from WIPO's expertise in order to help them in the review of the intellectual property laws. The CIPD will meet again in July 2008 before reporting back to the 2008 WIPO General Assembly later in 2008.

In June 2007 the World Bank hosted the Breaking Boundaries II seminar "Print on Demand and Internet Distribution of Public Interest Books"[65] in Washington. Publishers discussed how the digital age has fundamentally changed the way information is accessed and changed the nature of publishing content, created new issues around the ability for content creators to be recognised for their work while allowing audiences to freely and fairly access publications.

The 8th Infopoverty World Conference on "Low Cost-Smart technologies to fight poverty and save the planet" was held in April 2008 at the UN Headquarters in New York and simultaneously at the Politecnico in Milan via videoconference, organised by the Observatory for Cultural and Audiovisual Communication (OCCAM) with the support of GAID and the European Parliament, the Infopoverty Institute (University of Oklahoma), and the Politecnico di Milano.

In February 2008 the European Union awarded a US1million grant to a consortium of 11 organisations to explore the use of Free/Libre/Open Source Software (FLOSS) as a development tool. Called FLOSSInclude, the project is funded under the EU's 7th Framework Programme, and will be carried out by a team of research institutes, government agencies, private companies and non-governmental organisations in nine countries – Argentina, Cambodia, China, Ghana, India, South Africa, Spain and the UK. The consortium is led by UNU-MERIT, a joint research and training centre of United Nations

---

64   http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_1/cdip_1_4_prov.pdf
65   http://info.worldbank.org/etools/bSPAN/PresentationView.asp?PID=2110&EID=960

University and Maastricht University in the Netherlands. The result is expected to be a roadmap for future EU development research cooperation[66].

The ICTP in Trieste, continued its programme for training scientists on the use of wireless networking with three workshops, in February and December 2007 and one in March 2008. ICTP has since 1996 trained about 1500 participants from all the continents.

With the lack of household access to ICTs, especially in developing countries, efforts to establish public access facilities continued to gain attention in 2007. One of the largest such initiatives is the Global Libraries[67] programme of the Bill and Melinda Gates Foundation which disbursed over USD30mn in 2007 to help support the provision of free Internet access in the national public library systems in eastern Europe, Asia, Africa and Latin America, and to research and promote the socio-economic impact of public access to ICT facilities.

By 2007 UNESCO had helped to set up Community Media Centres (CMCs) in 25 countries with 130 pilot projects, training nearly 1500 community media workers on local content development and supporting other capacity-building projects on media pluralism in 80 countries.

Telecentre.org, the partnership between IDRC, the Swiss Agency for Development and Cooperation (SDC) and Microsoft, hosted the Telecentre Leaders Forum in December in Kuala Lumpur, prior to the GK3 event where it also co-sponsored a Telecentre Village exhibition. The forum was attended by 85 people from 61 organisations and 42 countries. Telecentre.org is currently supporting national telecentre networks in 25 countries and its goal is to train a million or more people through national academies by the year 2010. At the same time, telecentre.org engaged in knowledge sharing partnerships with Centre Songhai (Benin), UNDP Egypt, CSDMS (India), CEPES (Peru), and UgaBYTES (Uganda) to strengthen and expand community content facilitators and increase community engagement. GAID has also announced plans to collaborate with telecentre.org to support the scaling up of the telecentre movement, promote assistive technologies for people with disabilities, and advocate for free Internet accessibility for schools. GAID plans to assist with the creation of the international Telecentre Academy, along with a Telecentre and Community Computing Centre of Excellence, and encourage the creation of telecentre networks in at least 20 countries by 2010. In addition, GAID is helping to create a collaborative research and development fund supporting social enterprises that produce local content products and services for the rural poor, offered through telecentres.

Chip maker AMD has taken an active role providing ICT training labs in developing countries through its "50x15" initiative which aims to help ensure that 50 percent of the world's population have Internet access by 2015. By 2007, Learning Labs supported by the 50x15 Initiative were present in Brazil, China, the Caribbean, and in particularly in Africa (Egypt, Ghana, Kenya, Lesotho, Mali, Mauritius, Rwanda, South Africa, Uganda), with more in planning.

Building on the success of the African Gender Research in Africa into ICTs for Empowerment (GRACE) project, in 2008 IDRC began financing the expansion of the network to North Africa and Asia. The network of researchers currently supports studies in 12 countries looking at how women use ICTs to improve their lives and to identify the barriers that prevent many women from doing so.

---

[66]   http://flossinclude.eu
[67]   http://www.gatesfoundation.org/GlobalDevelopment/GlobalLibraries

Access by disabled persons to information, especially to information on the web, is a special concern under this Action Line. The International Labour Organisation estimates that there are 610 million disabled people worldwide. The digital divide is growing between people with disabilities and those without, due to the fact that growing numbers of basic services – health, education and government were being mediated through ICTs which may not be adapted for use by those with disabilities. Users with disabilities and special needs continue to face numerous limitations on their access to services which are essential for social and economic life. ITU-T has recently defined quality criteria for sign language communication and real-time text to suit conversational needs.

Research conducted in March 2006 in the United Kingdom by user-experience-experts, Nomensa, showed that almost 75% of businesses in the FTSE 100 list of companies fail to meet the minimum requirements for website accessibility. The homepages of each website were measured and evaluated, using manual testing against the globally recognised Web Content Accessibility Guidelines (WCAG). Nomesa concluded that companies failing to meet the minimum requirements forego over £80bn in revenue and leave themselves to legal action for ignoring the national Disability Discrimination Act. [68]

In April 2008, the World Wide Web Consortium (W3C) released the candidate recommendation for the new Web Content Accessibility guideline 2.0, which covers a wide range of recommendations for making web content more accessible, including for persons with disabilities[69].

As part of its work on standards development for telecommunications equipment, software and associated telecommunications services, ITU published telecommunication accessibility guidelines and an accessibility check list. These publications were to ensure that the needs of those for whom accessibility to ICTs may be restricted[70], are taken into account at an early stage of the process. A workshop "Making Accessibility a Reality in Emerging Technologies and the Web" was organised by ITU during the Internet Governance Forum (IGF) in Rio de Janeiro in November 2007. The event brought together experts from around the world to examine the best way to resolve accessibility needs in ICT and emerging technologies. As a result, ITU proposed to the IGF in February 2008 the establishment of a Dynamic Coalition on "Accessibility and Disability"[71]. In April 2008 ITU, together with G3ict, held a joint Forum in Geneva to review areas of challenges and opportunities for international ICT accessibility standards in light of the UN Convention on the Rights of Persons with Disabilities. The Convention has been signed by a high number of UN Member States in a relatively short time – 126 since March 2007. World Telecommunication and Information Society Day 2008 is focussed on Connecting Persons with Disabilities, and a global celebration in Cairo will take place during ITU Telecom Africa in May.

A project[72] to study the opportunities for teleworking for the disabled was launched in 2007 by the Asociacion Argentina Usuarios de la Informática in Argentina with support from IDRC. Researchers will analyze the socio-labour profile of people with disabilities in nine Latin American countries and

---

[68]   http://www.nomensa.com/news/at-nomensa/2006/4/ftse-100-websites-fail-accessibility-requirements.html
[69]   http://www.w3.org/TR/2008/CR-WCAG20-20080430/
[70]   http://www.itu.int/ITU-T/studygroups/com16/accessibility/
[71]   http://www.itu.int/themes/accessibility/
[72]   http://telecapacitados.tic.org.ar

assess whether capacity building in ICTs and telework constitute an alternative for bringing them into the labour force.

Ensuring open access to information also entails preserving data residing on old digital media. This is becoming a growing problem because of the degradation of the physical media that it is stored on, and because of the deterioration of equipment able to read the media. The present day cost of professionally preserving digital information is US$5-8 per GigaByte per annum which equates to a global cost of $60-96 bn per annum for the amount of information at the start of this century.

Africa
In Morocco in November 2007, the African Conference on Free Software (RALL) took place with support from the Organisation de la Francophonie (OIF) and local partners, the Ministry of Commerce, Industry and New Technologies and the Department of Posts, Telecommunication and Information Technologies. The event focussed on the application of free software in education, in line with the 11th Francophone Summit in Bucharest in 2006 which called for greater use of ICTs in education in developing countries. OIF also continues to support a range of activities to encourage the use of Free and Open Source Software in francophone countries with the provision of mirror sites of software and training courses.

The Publishing and Alternative Licensing Models (PALM) Africa project, recently funded by IDRC will try to better understand whether the adoption of more flexible licensing regimes will contribute to improve the publishing of learning materials in Africa.

Given the lack of electricity and telecommunication access in Africa, rural business centres as a model for the shared provision of public access to ICTs, often combined with renewable energy support, gained significant attention in 2007. UNIDO has been working to extend ICTs to rural areas through renewable energy powered Business Information Centres (BICs). In December 2007 the first centre was opened in Mozambique, where, in addition to the provision of access to ICT, the centre will also demonstrate the use of renewable energy for productive activities, particularly to empower rural small-scale entrepreneurs. Other renewable energy powered Centres will soon be replicated in Nigeria, Uganda and Kenya. UNIDO is also using mobile telephony to take the services of the Centres to the surrounding community, aiming to enable women entrepreneurs to build businesses as 'village phone operators', farmers to make better choices based on market conditions, the rural poor to receive banking services and to stimulate locally designed mobile based solutions. UNIDO also focussed on renewable energy based economic development, with solar and wind powered rural community development centres in the remote Indian Ocean islands of the Laccadives. In November 2007, UNIDO and Microsoft won the Africa Investor Award in the category "Best Initiative in Support of SME Development" for the Uganda Business Information Centre project. UNIDO and Microsoft recently expanded their strategic partnership to develop a sustainable business model for refurbishment centres in developing economies to address the needs of SMEs for affordable quality hardware.

The ECA's *ICT Best Practice Forum*, which took place in Burkina Faso in June 2007, drew over 350 delegates from 60 countries across West and Central Africa, representing government, the private sector, civil society, the press, and international financial and government institutions. At the event UNIDO and Microsoft announced they will expand their strategic partnership to create a sustainable and environmentally responsible local computer-refurbishment program for emerging markets. The refurbishment centres complement UNIDO's Business Information Centre programme by: creating an

affordable supply of hardware for the BICs, providing additional income sources for the centres by enabling them to sell computers to SMEs and increasing the outreach of affordable quality hardware to rural areas.

In December 2007 UNIDO completed the Lighting Up Kenya programme which tested 10 sites in developing a model for an "Energy Kiosk" – a shop, where electricity can be bought in off-grid villages of Kenya for battery recharging for mobile phones, to run community centres, or to power nearby local schools by extending lines from the Kiosk. The Kiosk receives electricity from a local renewable energy source such as a micro hydro-power unit, solar-, wind- or biomass-based power generator running on locally available vegetable oils. In 2008 the project aims to replicate this to 100 communities. UNIDO also organised a Regional Renewable Energy Workshop on "Providing Access to Modern Energy in Rural Areas" in Kigali in February 2007.
UNEP and the UN Foundation's e-CARE project commissioned the 50th solar-powered rural business centre in Ghana in January 2008. The project, with support from Norwegian company Telecom Management Partners, aims to develop ecommerce as a viable sector of rural economies by extending internet and other IT services; and to eliminate the energy barrier to telecoms and internet access by using renewable energy technologies.

Asia and the Pacific
In 2007 ESCAP facilitated the establishment of community e-centres (CeCs), to provide increased ICT accessibility to rural areas in Bangladesh, Bhutan, India and Nepal. ESCAP is also building the capacity of enterprise support agencies through training workshops and pilot e-business implementation in four countries, namely China, Cambodia, Laos and Vietnam, for the development of e-business services for Small and Medium-sized Enterprises (SMEs).

A conference on Developing National Strategies on FOSS in Central Asia was held in Dushanbe, Tajikistan, in July 2007, organized by UNESCO with the Global Internet Policy Initiative Tajikistan and the Open Society Institute Tajikistan. The conference focussed on applications that have been supported by UNESCO, such as Museolog, the museums digital catalogue software, which was upgraded in April 2008.

In September 2007 APDIP published an e-Note on how the affordability of FOSS and its openness to modification and localisation is contributing to the sustainability of telecentres, and more broadly, to empower communities and aid poverty reduction. This e-Note explores the benefits of using FOSS applications in telecentres with case studies from Bangladesh, India, Pakistan, Brazil, Egypt and Sub-Saharan Africa. Another e-Note was published on Standards for Electronic Documents which details the development of OpenDocument Format for Office Applications (ODF). It also looks at how governments worldwide have started to adopt ODF in public administration.

In India, by 2007 UNEP's Indian Solar Loan programme had financed 20000 households, benefiting over 100,000 people. Other lenders have since entered the market which is now generally financed 50 percent on credit, a situation that did not exist prior to the UNEP programme. In recognition of its success, UNEP, the UNEP Risoe Centre and the Indian Solar Loan Programme received the Energy Globe Award in 2007.

ESCAP held a meeting in September 2007 in Bangkok on establishing a regional knowledge network of e-centres to improve their effectiveness and maximize limited resources by networking with each other to share experience and products, including content such as market information and training materials. Around 30 participants representing information and communication technology ministries, telecentres and telecentre associations, NGOs and UN agencies participated.

Under the APEC Digital Opportunity Centre project (ADOC), two e-Commerce Centres were established in Peru in March 2007. These aim to provide ICT related training for small and medium size businesses (SMEs) to help them to take advantage of the business opportunities afforded by the Internet. ADOC is a four-year project initiated by Chinese Taipei and seven APEC economies currently participate in the project – Chile, Indonesia, Peru, Papua New Guinea, the Philippines, Vietnam and Thailand.

To enhance partnership for the inclusive Information Society, the APEC secretariat organised an Expert Group Meeting on the Provision of ICT Access for Disadvantaged Communities through Public-Private Partnership where various aspects of partnership, including related policies and legislations, ICT infrastructure, content, capacity building, financing, perspectives on gender and persons with disabilities, were discussed.

The Women's Digital Economy Forum took place in June 2007 in Australia as part of the APEC's Women in the Digital Economy programme (2005–2009) which aims to generate e-business opportunities for women entrepreneurs. The initiative comprises four components – research, capacity building, e-community building and a policy forum. About 90 CEOs and policy makers from ten APEC economies attended and policy recommendations for each country were produced. In addition, four APEC Women's e-Biz Training workshops were held in 2007, in Seoul in July, in Indonesia, Singapore and Vietnam in November. Among the 39 participants were policy makers and APEC women CEOs endorsed by ITU, UNAPCICT and APWINC. A total of 137 women participated and 15 business plans were developed. The programme is also identifying the needs of women's enterprises in e-commerce and developing ICT and e-business indicators of women-owned enterprises. In 2007 it published a report: "Women-Owned SMEs and E-Business in Twelve APEC Economies".

ECE-Region
The European Commission instituted the ICT Policy Support Programme in 2007 which will run until 2013 with a budget of €738mn. The fund is the main financial instrument for the 2010 initiative which is the EU policy framework for promoting the information society and media. In 2007 the programme focuses on three main themes: 1) Efficient and interoperable e-Government services, 2) ICT for accessibility, ageing and social integration and 3) ICT for sustainable and interoperable health services. Other actions address the themes of sharing experience on ICT initiatives for SMEs, supporting sustainable growth, Intelligent Cars awareness action and privacy protection infrastructures.

ICT research is one of the key themes of the EU's Seventh Framework Programme (FP7) which will provide €9.1bn to fund public research across Europe from 2007 to 2013. The ICT research priorities are: 1) Pervasive and trusted network and service infrastructures, 2) Cognitive systems, interaction and robotics, 3) Components, systems and engineering, 4) Digital libraries and content, 5) Sustainable and personalised healthcare, 6) Mobility, environmental sustainability and energy efficiency, 7) Independent living and inclusion, and 8) Future and emerging technologies (FET).

Latin America & the Caribbean
In March 2007, ESCAP published an Assessment of the Status of the Implementation and Use of ICT Access Points in Asia and the Pacific as part of the programme "Knowledge Networks through ICT Access Points for Disadvantaged Communities", which is being implemented by the five United Nations Regional Commissions. The study identified 11,160 telecentres in 16 countries, most of them in India. According to the study, it was estimated that more than 400,000 new telecentres would be needed to extend the reach of the telecentres to the rural population of these countries. The study also recommended that two regional knowledge networks in Asia-Pacific be established under the project: the first one on agricultural and rural related information, and the second one on e-literacy initiatives including e-learning.

In September 2007 ECLAC held a seminar on Latin American Encounter of Telecentres and Social Inclusion 2007. About 300 participants attended the meeting, most of which were telecentre operators, also attending were government policy makers.

In 2007 the Executive Secretariat for Integral Development of the Inter-American Agency for Cooperation and Development (SEDI/IACD) in collaboration with the Renewable Energy in the Americas (REIA) Initiative of the Organisation of American States (OAS) has continued to develop its Rural Connectivity and Energy Initiative. The programme supports the use of appropriate energy generation and storage systems, telecommunication systems and information technology packages including computers with Internet connection to meet community service needs.

The first Latin American Region Wireless Training Project workshop for NGOs took place in Peru in 2007, organised by WILAC[73], a network on wireless technology for development in Latin America and the Caribbean hosted by the Fundacion ESLARED and supported by IDRC's Institute for Connectivity in the Americas. Subsequent workshops were held in October 2007 in Argentina and in Mexico in December.

Western Asia
To meet WSIS goals of connecting all villages by 2010, ESCWA initiated the Smart Community Project (SCP), as a mechanism for local resource development and job creation in rural communities. Pilot facilities, which combine a Multipurpose Technology Community Centre (MTCC) and an Agro-Food Processing Unit (AFPU), were successfully set up in Iraq, the Syrian Arab Republic and Yemen and connected to MTCCs in Lebanon. These facilities are connected with each other, as well as with other institutions such as universities and NGOs.

C4 Capacity-building
It should be noted here that many of the activities outlined under other action lines also include more specific capacity-building elements related to the particular activity.

ITU, UNCTAD and DESA organised workshops and training courses in 2007 on a wide range of topics, including ICT and telecommunication regulations and policy, rural communications, spectrum management and standardisation, ICT policies, information economy, and e-commerce legal issues.

---

[73]   http://www.wilac.net

Some of the events were undertaken electronically, such as through UNCTAD's Virtual Institute, or ITU's public digital library. ITU also engaged in the formulation and implementation of various human capacity building projects such as the rehabilitation and reconstruction of the Information and Communication Training Institute (ICTI) in Kabul, Afghanistan.

By 2007 the ITU's Human Capacity Building ITC Initiative for Developing Countries, which was launched in May 2001 in partnership with Cisco Systems to provide students and professionals in developing countries with affordable training in Internet Protocol (IP) networking. had trained reached the following mile-stones: 66 centres, in 56 countries, over 3,500 students currently enrolled, more than 4,000 graduates and 20 centres expanded to include varied curriculum such as cabling, wireless and IT essentials. ITU and Cisco have proposed building on the initiative to establish new centres and extend training to soft skills such as entrepreneurship development, employment and income generation. Within all of these program categories, special emphasis is to be put on assisting women, youth and disabled populations.

A new Global Capacity-Building Initiative (GCBI) was launched in 2007 by ITU with *Info*Dev and the World Bank. The Initiative includes targeted, client-oriented capacity-building activities for policy makers and regulators from developing and least developed countries support governments in leveraging the role of the ICT sector as a key driver for economic and social development. The first GCBI training event took place in collaboration with ARICEA and COMESA for regulators and policy makers in Eastern and Southern Africa, in Addis Ababa in November, 2007.

UNIDO's The Entrepreneurship Curriculum Programme (ECP) aims at stimulating entrepreneurial talents among young people by enhancing their ability to identify economic opportunities and by developing creativity, innovativeness, planning and leadership skills, which will aid them in their professional life. In order to start familiarising youth with the entrepreneurial potential of ICT, UNIDO announced in 2007 that it was developing, in partnership with Microsoft, tailored ICT training modules within its ECP.

In Sept 2007 a new phase of Intel's World Ahead Program began when it was announced that an alliance of 16 companies had been formed to expand Intel's efforts to provide people in developing countries with the benefits of technology. The World Ahead Alliance brings together 16 Indian organisations that have been influential in the results achieved during the early phases of the Intel World Ahead Program, including non-profits, education companies, hospitals and service and technology providers. Intel's World Ahead efforts in India include working with state governments to equip approximately 100 schools with desktop PCs and the Intel-powered Classmate PC. Since the program began Intel and 15 state governments have trained more than 730,000 teachers how to apply technology to improve student learning through the Intel Teach Program. In addition, an agreement was made between Intel and UNESCO to work in the education sphere, including teacher professional development, developing policies for the innovative use of technology in curriculum and promoting scientific research in higher education.

Led by UNESCO, *info*Dev and IDRC, the promotion of IT parks, 'knowledge parks' or 'clusters' have gained increasing attention in 2007 as a means to achieve a critical mass of both applied and academic ICT skills. The International Conference and Exhibition on Knowledge Parks was hosted by UNESCO in Doha, Qatar, in March 2008 with support from *info*Dev and the Qatar Foundation. The event

provided a platform for key players around the world to discuss how to use ICTs to foster entrepreneurship, improve education and empower individuals in developing countries was the subject of the International Conference and Exhibition on Knowledge Parks.

*info*Dev, in cooperation with the Global ICT Department (GICT) of the World Bank Group, announced that it has commissioned a global best practice study on IT Parks which will draw on the experience of several countries and leverage *info*Dev's global network of business incubators. The objectives of the study are to deliver a "Best Practice Guide", documenting global lessons learned and best practices in establishing sustainable IT Parks and identifying the critical business success factors. In addition, it will develop guidelines for policy makers to stimulate private sector investment in the IT sector and spill over into the broader economy.

Africa
In April 2008, Microsoft launched the NGO ICT4D Academy at the African ICT Best Practices Forum in Burkina Faso. It will focus on three areas: ICT4D skills development, IT support services and e-Readiness. Partners, including the Aga Khan Foundation and the Academy for Educational Development, are supporting the project and the first Centre of Excellence will open in South Africa, serving as a venue where NGOs can network and explore collaborative opportunities. Additional regional centres are being discussed with local partners in Ghana, Kenya and Senegal.

In 2007, the Canadian government development research agency, IDRC, expanded its Acacia programme which was first established in 1997 with the objective of supporting Sub-Saharan communities to integrate ICTs in their development strategies, and helping them to meet their own social and economic development. Acacia has since invested more than USD40mn in research, demonstration and evaluation projects on key ICTs issues, focussing on support for the development of regional African research networks on specific themes such as ICT policy (RIA), women and ICTs (GRACE) and local e-government (LOGIN).

Asia and the Pacific
ESCAP held a regional workshop on Knowledge Sharing through Community-based E-Learning Facilities in Rural Areas[74] in June 2007 in Xining, China. The workshop brought together international and local participants to discuss the promotion of knowledge sharing services and networks in rural communities through community-based e-learning facilities and multi-purpose community e-centres took place.

Within the framework of the Working Group on ICT under the Special Programme for the Economies of Central Asia (SPECA), several regional capacity-building seminars on ICT policy making were organised jointly with ESCAP.

ECE-Region
ECE continued to promote gender mainstreaming in ICT strategy and action plans at regional and sub-regional levels through training workshops, and supported capacity-building within National Statistical Offices to develop gender-disaggregated data related to ICTs.   ECE also continued its series of workshops to address issues relating to the support systems for women in small business and theuse of

---

[74]   http://www.unescap.org/icstd/applications/projects/e-learning-CeC/reg-workshop.asp

information and communication technologies for SMEs. ECE organised two 14-training workshops in 2007 and two more training workshops have been planned for 2008.

A conference on Innovation in the Software Sector was jointly organised by the OECD, the Spanish Ministry of Industry, Tourism and Trade and the regional government of Extremadura, in November 2007. The conclusions of this conference provided inputs for the development of OECD projects on software innovation, and will be taken into account in an interim report to OECD Ministers in 2008.

Latin America & the Caribbean
In Latin America, new targets were set for connectivity in educational institutions in 2007. In the previous strategic plan the target was to connect one-third of public schools and libraries to the Internet (double the number then connected). In the plan agreed in February 2007 (eLAC2010) the target is to connect 70 percent of public educational institutions or triple the number connected as of 2007.

Western Asia
As part of on-going ESCWA efforts towards establishing the Technology Centre for Development, an expert consultation meeting was held in Amman during November 2007. The focus of discussion was a report produced by ESCWA: "Detailed Assessment of Regional Needs and Priorities and Identification of Implementation Mechanisms". Experts from different science, technology and innovation domains attended the meeting with the aim of reviewing the report and producing an enhanced version. Deliberations concluded that such a centre is relevant and necessary for the socio-economic development of the ESCWA member countries and the region given the increasing globalisation and world competitiveness.

C5 Building confidence and security in the use of ICT[75]

The growing dependency on ICTs for the operations of modern society has led to increasing priority being placed on cybersecurity threats, with a growing linkage between cybersecurity and critical information infrastructure protection (CIIP). In the last year more countries began assessment of threats, vulnerabilities and mechanisms to redress them, however most countries have not yet formulated or implemented a national strategy for cybersecurity and CIIP. In 2007, particularly aggressive Botnets[76], such as the Zhelatin (Storm Worm) used advanced techniques such as striking back with attacks against the computers of security researchers or vendors trying to mitigate the Botnet.

According to some sources, unsolicited email (Spam) accounted for up to 90% of all email traffic over the Internet in 2007 and it is also increasing on mobile phones. Spam has mutated from a general annoyance to a broader cybersecurity threat, acting as a platform for many types of scams such as phishing – a form of 'social hacking' aimed at tricking the user into providing credit cards or information needed for identity theft. A survey last year found that in the US, almost 20% of adults had already fallen victim to an online scam of some sort. The OWASP Top Ten Project, a US industry awareness building effort, listed the following as the most serious web application vulnerabilities in 2007: Cross-site scripting (XSS), injection flaws, malicious file execution, insecure direct object reference, cross-site request forgery (CSRF), information leakage and improper error handling, broken authentication and

---

[75]   Some activities listed here are also often associated with action lines on Enabling Environment (C6) or e-Business (C7) and vice-versa.
[76]   Networks of compromised computers infected with viruses or malware without their user's knowledge

session management, insecure cryptographic storage, insecure communications and failure to restrict URL access.

Future risks are likely to arise from the increased ubiquity of ICT systems which includes the increased automation of homes and the possibility of controlling home appliances remotely, such as heating or air conditioning equipment over the Internet. This could even extend to the use of vulnerabilities in home appliances to attack public infrastructures, such as distributed denial-of-service attacks on electricity networks using Internet-controlled heating or air-conditioning. Risks may also arise from invisible data collection in public places such as road toll collection systems, surveillance cameras and consumer tracking, as well as in private premises (e.g. retention of telecommunications data and storage of user data by internet search engine operators), and on portable devices such as mobile phones. The financial impact of these threats is hard to quantify, but as one indication, research in the US in 2007 has suggested that consumers are about one third more likely to make a purchase on a site that is certified as 'hacker safe' than on a site lacking the certification.

A number of international initiatives are aimed at addressing these threats. The ITU Secretary-General launched the *Global Cybersecurity Agenda* (GCA) in May 2007. The GCA, a framework for international cooperation in cybersecurity[77], is made up of seven strategic goals[78] and builds upon five pillars: (1) Legal Measures; (2) Technical and Procedural Measures; (3) Organisational Structures; (4) Capacity Building; and (5) International Cooperation. GCA will build on existing national and regional initiatives to avoid duplication and encourage collaboration amongst all relevant partners. A High-Level Experts Group was subsequently established to advise the ITU Secretary-General on strategies of implementation.

ITU set also up a new study group on securing ICT networks. As part of this Group's activity, a report on "Best Practices for a National Approach to Cybersecurity" outlined a framework for national approaches to cybersecurity. ITU's *Cybersecurity Work Programme* plans a series of regional capacity-building events on Frameworks for Cybersecurity and Critical Information Infrastructure Protection (CIIP)[79]. It also released a National Cybersecurity/CIIP Self-Assessment Toolkit[80] which is being piloted in Malaysia, and a Botnet Mitigation Toolkit[81]. ITU has also developed an ICT Security Standards Roadmap to assist in the development of security standards[82]. In 2007 the ITU organised a series of regional forums on cybersecurity and critical internet resources in Cape Verde (November), Damascus (October), Buenos Aires, (October), Geneva (September) and Hanoi, (August). A contact database and Who's Who publication, along with the development of cybersecurity indicators and a survey on anti-spam legislation worldwide is planned for 2008. ITU and Microsoft announced they will collaborate globally on cybersecurity and provide support for regulators in developing countries.

An OECD Workshop on Digital Identity Management (IDM) took place in Trondheim in May 2007. Hosted by the Norwegian Ministry of Education and Research and the Ministry of Government

---

[77]   http://www.itu.int/cybersecurity/gca
[78]   http://www.itu.int/osg/csd/cybersecurity/gca/goals.html
[79]   http://www.itu.int/ITU-D/cyb/events
[80]   http://www.itu.int/ITU-D/cyb/cybersecurity/projects/readiness.html
[81]   http://www.itu.int/cyb
[82]   http://www.itu.int/ITU-T/studygroups/com17/ict/index.html

Administration and Reform, it brought together experts from government, industry and civil society to explore the main information security and privacy issues surrounding digital identity management.

The 7th International Conference on Cyber Crime organised by Interpol took place in New Delhi in September 2007 and The Fourth International Conference on Cyber Crime Investigation (ICCyber) & The Second International Conference on Forensic Computer Science (ICoFCS) took place in September 2007 in Sao Paulo[83].

In June 2007, the Council of Europe held its Octopus Interface Conference in Strasburg to promote its Cybercrime Convention and the additional Protocol as a guideline for national legislation and practice, to strengthen cooperation among different stakeholders and to encourage wide and rapid ratification and accession to these treaties. It is noteworthy that the Cybercrime Convention of the Council of Europe is open for signature also to States which are not part of the Council of Europe. Some 140 representatives from 55 countries, international organizations and from the private sector participated.[84]

Africa
In January 2007 a workshop organised in Ouagadougou by ECA gathered ICT experts, lawyers, trade specialists and economists to identify the most effective legal framework for ICT development in the region. Discussions focused on how to put in place an enabling legal environment for e-commerce and for an enhanced cybercrime control. The event considered two studies funded by Finland and by the Canadian e-Policy Resource Center, on a harmonised legal framework for e-commerce and a harmonised legal framework on ICT in general. This workshop was part of a process involving the Economic Community of West African States (ECOWAS) and the West African Monetary Union (UEMOA) which have formed a partnership with ECA to assist with arrangements for the adoption of a common regulatory framework on ICTs for West Africa, as a way of attracting foreign direct investments by modernising the instruments for promoting e-commerce, preserving personal data and curbing cyber crime. ICT experts from ECOWAS subsequently adopted guidelines on combating cyber crime in December 2007 in Lome and ECOWAS Heads of State are expected to adopt the guidelines as directives in 2008. ECA also assisted Burkina Faso, Ghana, Kenya and Mozambique to develop national cyber security frameworks[85].

Asia and the Pacific
In April 2007 the APEC-OECD Malware Workshop in Quezon City, Philippines was held to explore issues raised by malware and other related malicious activities over the Internet. Participants also examined the scope for closer coordination with various other organisations involved in fighting malware. It was concluded that there is a need for structured coordination at national and international levels with involvement of all stakeholders. The workshop was the first step in a joint work programme on the subject of malware being undertaken by APEC and the OECD, and was followed by the APEC-ASEAN Joint Workshop on Network Security which focused on cyber crime legislation; policy and regulatory and enforcement capacity building. Participants also identified open source tools that could

---

83   http://www.ICCyber.org
84   http://www.coe.int/t/e/legal_affairs/legal_co-operation/combating_economic_crime/3_Technical_cooperation/CYBER/Octopus_if_2007.asp
85   http://www.uneca.org/disd/events/2007/ecowas-legal-framework/content/Harmonising_Legal_Framework_ICTs_West_Africa-Cisse-en.pdf

be used by economies with limited resources and concluded that there is a need for economies to establish a common legal framework as a first step to combating cyber crime globally.

The second seminar on the implementation of the APEC Privacy Framework, took place in June 2007 in Cairns, Australia, on Cooperation and Cross-Border Privacy Rules. The seminar brought together privacy experts, government officials, privacy regulators, businesses to discuss the implementation of a Cross-Border Privacy Rules (CBPR) system based on the model identified in the previous seminar. The seminar also provided input to decisions on APEC in 2008 within the proposed Data Privacy Pathfinder framework that would assist in implementing these cooperative arrangements.

A seminar on the implementation of the APEC Privacy Framework – "Data Privacy & E-Commerce: Fostering Economic Growth" was held in Lima in February 2008 to support enhanced understanding of the diverse cultures of privacy among APEC member economies and to consider how the APEC Framework can address privacy in the region.

ECE-Region
The European Commission held a public forum in January 2007 in Brussels on the availability and robustness of electronic communication networks. The meeting considered a study conducted for the Commission on the availability and robustness of electronic communication networks which provides insights in the availability and security provisioning of electronic communication networks and makes a number of key recommendations to enhance their protection and resilience.

In March 2007 the regional conference for countries of south-eastern Europe on cooperation against cybercrime was held in Belgrade, funded by the Council of Europe PACO Serbia project on economic crime.

Latin America & the Carribbean
The OAS Cyber-Security Program advanced in 2007 to help OAS Member States establish Computer Security Incident Response Teams (CSIRT); to train designated CSIRT staff; and to facilitate the creation of the Inter-American Network of CSIRTs. By April 2007, 11 OAS Member States had formally designated national CSIRTs. The first OAS Course on CSIRTs took place in Brasilia in June 2007, with support from the Brazilian Intelligence Agency (ABIN) and the Department of Information Security and Communications (DSIC). The 43 participants produced a non-binding strategic document entitled Carta de Brasília (Charter of Brasilia). CICTE Secretariat 2006–2007 efforts on cyber security culminated in a Second Cyber Security and Cyber Crime Workshop held in Miami November 2007. Representatives from thirty-one OAS Member-States attended. The OAS Office of Information Technology is to host a pilot project to begin establishing the Inter-American Network of CSIRTs.

Western Asia
About four hundred representatives from public and private sector institutions in the Arab region participated in the first regional conference on cybercrime in Cairo in November 2007. The Conference was organised by the Egyptian Association for the Prevention of Information and Internet Crimes and supported by the Information Technology Industry Development Agency (ITIDA), the Council of Europe, the United Nations Office on Drugs and Crime, Microsoft, Ain
Shams University, IRIS, EASCIA and other partners.

A regional workshop on cybercrime for prosecutors of the Arab region was held in Casablanca, Morocco in June 2007, organised by the POGAR programme of the United Nations Development Programme.

In February 2007 ESCWA published a study entitled "Models for Cyber Legislation in ESCWA Member Countries". The study reviews the status of regional and international cyber laws and uses examples of legislative principles to illustrate the benefits and challenges of enacting comprehensive cyber legislation. The following areas were highlighted: (a) data protection and privacy rights; (b) protection of privacy and freedom of information in the electronic communications sector; (c) censorship and freedom of expression in cyberspace; (d) intellectual property; (e) e-transactions, e-commerce and related fields; (f) consumer protection; and (g) cyber crime. In December 2007, ESCWA held a Peer Consultation Meeting (PCM) in Amman which discussed the aforementioned study and introduced a cyber legislation template. Participants expressed the need to develop regional models for cyber legislation. They also emphasised the necessity of updating such models periodically to keep up with the rapid pace of technological change. Nine countries were represented in the meeting and ESCWA was urged to propose a regional model to help harmonise cyber legislations in the region. It was also recommended that ESCWA promote activities aimed at improving the adoption of a common Arabic terminology for the field and creating data banks that would be used for the research and development of cyber legislation.

A conference on Combating Cybercrime in countries of the Gulf Cooperation Council was held in Abu Dhabi in June 2007. It was organised by the UAE Ministry of Justice in cooperation with Microsoft and with the participation of high-level officials.

C6 Enabling environment
The ITU has continued to support a wide range of activities to support the development of enabling environments for the adoption of ICTs. In December 2007 the ITU and the EU announced a joint project to attract greater investments in ICT infrastructure in the Caribbean, Africa and Asia and the Pacific. The project aims to harmonise regulatory frameworks within the different regions, and to build human and institutional capacity in the field of ICT through a range of training, education and knowledge-sharing measures. As part of the agreement, the European Union has allocated €8mn from the European Development Fund, to which ITU will add USD 500,000. ITU publications released in 2007 include the 8th edition of Trends in Telecommunication Reform 2007, and the Road to Next-Generation Networks (NGNs). In 2007 new modules were included in the ITU/*Info*Dev ICT Regulation Toolkit[86], a web-based tool which provides regularly updated regulatory topics, best practices and case studies. Publication of Executive Summaries of the Toolkit in English, and subsequently other languages, is currently being planned, starting with French and Spanish in 2008.

ITU continued to carry out studies and establish recommendations on questions related to the broad aspects of spectrum management, and the improvement of the international spectrum regulatory framework was considered during the 2007 World Radio-Communication Conference. The 7th Global Symposium for Regulators (GSR) took place in Dubai in February 2007 and focused on the best practice guidelines needed to facilitate the migration of Next Generation Networks.

---

[86]   http://www.ictregulationtoolkit.org

UNCTAD has also continued to support countries with national ICT policies and strategies towards creating a competitive information economy. UNCTAD also provided assistance to the East African Community (EAC) and with Asociacion Latinoamericana de Integracion (ALDI), to help harmonise their regional e-commerce legislations. In 2007 UNCTAD published the Information Economy Report 2007–2008 which aims to inform and enable governments to understand the policy challenges and opportunities. The analysis identifies important areas of concern and best practices necessary for the formulation of targeted policy decisions to support and accelerate ICT diffusion.

With support from *info*Dev and the IDRC, LIRNE.NET's World Dialogue on Regulation (WDR) published Diversifying Participation in Network Development in 2007, a book which provides reports and case studies on techniques for building networks in developing and emerging markets. The publication provides policy makers, regulators, operators and customers in emerging markets with a framework to help ensure sustainable solutions to the challenges of digital inclusion[87].

In October 2007 OECD published a report on "Global Opportunities for Internet Access Developments[88]". The report seeks to address the question of where the next billion users will come from and to examine the large shifts in communications policy which will make this a possibility.

APC and the Third World Institute launched the "Global Information Society Watch Report 2007[89]" in May 2007. This is the first in a series of annual reports that monitors the efforts made by governments and international agencies to ensure that the benefit ICTs reach the broader public, and examines local and global ICT policies and their impacts on people living in developing countries[90].

The international NGO network, PANOS, published in2007, several studies on communication for development, including the series called "At the heart of change" and the study "Common knowledge, how access to information and ideas can drive development"[91]. PANOS' Communication for Development programme has been working in the past to ensure that recent development debates on the importance of ICTs are rooted in an analysis that puts poor and marginalized people first, and that policy making for communication is demand-driven.

In 2007-08, IDRC supported regional initiatives aimed at bringing together stakeholders from different sectors to discuss and work together on issues that relate to the effective insertion of the region into the information society. IDRC is continuing to support two large networks of African and Asian ICT policy researchers - Research ICT Africa[92] (RIA), and LIRNEAsia[93] which were set up to inform policy makers and the private sector to adapt their strategies and applications to the needs of the poor in Africa and Asia. LIRNEasia also coordinates an activity entitled Communications Policy research South[94] (CPRSouth), a vehicle for building capacity in communication policy research in the Asia Pacific.

---

[87]   http://www.lirne.net
[88]   http://www.oecd.org/LongAbstract/0,3425,en_2649_33703_40199860_119666_1_1_1,00.html
[89]   http://globaliswatch.org
[90]   http://www.globaliswatch.org/download
[91]   The new studies are at http://www.panos.org.uk/global/program_news.asp?ID=1002
[92]   http://www.researchictafrica.net
[93]   http://www.lirneasia.net
[94]   http://www.cprsouth.org

A major event that took place in 2007 which brought together policy makers, experts, visionaries and practitioners to focus on issues related to the WSIS goals was the third Global Knowledge Conference, GK3[95], organized by the Global Knowledge Partnership from in December 2007 in Kuala Lumpur. GK3 gathered over 1,700 experts, innovators, practitioners and policy makers to debate the development and human dimension of ICT.

Africa

ECA continues to support the African Regional Action Plan on the Knowledge Economy (ARAPKE) which was by both the African Information Society Initiative (AISI) and NEPAD with support from the African Union. Eleven flagship projects have been proposed[96]. Many countries in Africa continued efforts to formulate and implement national e-strategies in 2007. With the assistance of the ECA, ten countries either began or consolidated their national ICT policy-making processes[97] during 2006–2007. The total number of countries in Africa with ICT policies increased from 13 in 2000 to 35 in 2007. Regional and sub-regional programmes and activities focused on capacity building, e-trade, combating cyber crime, and ICT applications. Supported by the Canadian Government funded Global E-policy Resource Network (e-PolNet) an expert group meeting was held in Kigali in October 2007, organised by the ECA, in partnership with the Canadian e-Policy Resource Centre (CePRC) and the Open Society for Southern Africa (OSISA). Under the theme "National ICT Policies: Regulation and Public and Community-based Access" for Eastern, Western and Southern English-speaking African countries the workshop brought together 40 African policy makers and other stakeholders who reached consensus that most countries had developed policies which remained unimplemented for various reasons, and there was a need to move from policy development to implementation. The participants urged the ECA and its partners to continue supporting this process to ensure that benefits from the Information Society are realised.

The Fifth Annual General Meeting of ARICEA took place in Cairo in February 2007 which concluded that the COMESA Secretariat and Member States should work on: (1) building ICT awareness; (2) elaborating and monitoring implementation of a National ICT Declaration and Action Plan; (3) verifying that the national plan is in line with the WSIS action plan, being implemented by the COMESA member states; and (4) developing and implementing ICT impact indicators in economic development.

A training workshop for ICT regulators and policy makers in Eastern and Southern Africa on competition and changing market conditions took place in Addis Ababa in November 2007 in collaboration with the Association of Regulators of Information and Communication for Eastern and Southern Africa (ARICEA) and supported by *info*Dev, the World Bank and the ITU and COMESA. The workshop was the first regional training event under the Global Capacity Building Initiative (GCBI) (see above).

In 2007, in consultation with member states of the African Union, the NEPAD e-Africa Commission developed an enabling policy and regulatory framework for international fibre-optic cable in East and Southern Africa. The outcome of this was a Protocol which was signed by 12 countries.

---

[95]   http://www.gkpeventsonthefuture.org/gk3
[96]   http://www.itu.int/ITU-D/connect/africa/2007/bgdmaterial/flagship-11.html
[97]   Cameroon, DRC, Chad, Liberia, Malawi, Niger, Nigeria, Rwanda, Sierra Leone and Togo

Asia and the Pacific
ESCAP organised a series of national and regional workshops in 2007 in Nepal, Lao PDR, Mongolia and Cambodia, which aimed at assisting policy makers to formulate and implement essential public and other ICT policies relevant to Internet Governance for socio-economic development. With the assistance of UNCTAD, Lao PDR and Cambodia, are both expected to have enacted e-commerce legislation in compliance with the e-ASEAN initiative by 2008.

At the APEC Telecommunication and Information Working Group (Tel) workshop on Universal Service Strategies in Santiago in October 2007, participants discussed common challenges and identified a number of common principles that might be considered (economic efficiency, consumer satisfaction, transparency, sustainability in the long term, competitive neutrality, cost effectiveness), and different issues that arise such as competitive ways to deliver services, security issues, copper vs. fibre, wireless broadband and issues around the sustainability of telecentres. A project group was established to build upon the work done in the workshop, which will take advantage of work done in Regulatel, ASEAN, and APEC TEL's own information on WTO implementation of USO commitments. This includes a survey of practices among APEC members with a view to compiling an inventory of universal strategies in the region.

The IDRC Asia ICT programme for 2006-2011 continues targeted research support in three key areas: Policies: Building evidence and promoting dialogue to inform policies that enable knowledge societies in Asia; Technologies: Applied research and piloting of innovative ICT applications for development (notably in education, health, livelihoods and governance); and Effects: Research and build capacity for understanding the socio-economic effects of ICTs on Asian communities.

In April 2007 ADB and Microsoft announced a partnership to enable countries in the Asia Pacific region to benefit from new opportunities created by ICT. The partnership will jointly undertake projects, studies and capacity building initiatives in five strategic areas of common interest: innovation, ICT and governance, ICT and education, enabling jobs and opportunity, and regional integration and trade.

ECE-Region
The introduction of a European Commission's Roaming Regulation which limits the fees operators charge for international roaming calls took place in August 2007. The Commission subsequently approved proposals in November 2007 to review the regulatory framework that had been in place since 2002. To ensure that national regulators have the necessary tools and powers to ensure fair competition, the Commission is proposing to create a new EU-wide telecom regulatory agency. The agency would also act as a European centre of excellence for network and information security, helping the Commission to step up the fight against spam, and taking over the tasks of the European Network and Information Security Agency (ENISA). The Commission has also proposed introducing a Europe-wide system for trading radio spectrum.

In preparation for the launch of the i2010 e-Inclusion strategy in 2008, the European Union published its Report on the Public Consultation on its e-Inclusion strategy in November 2007, following a public on-line consultation, which took place between June and August 2007.

Latin America & the Caribbean
Building on the success of the implementation of the 2005-2007 Regional Action Plan (eLAC2007) a subsequent 2008-2010 Action Plan (eLAC2010) was adopted at the Second Ministerial Conference on the Information Society in Latin America and the Caribbean, which took place in San Salvador in February 2008. The Conference, which gathered over 250 decision makers, also set up a new follow-up mechanism which includes a second level of thematic coordination for each of the focal areas in eLAC2010, to be led by Cuba (on education), Costa Rica (infrastructure and access), Mexico (health), Peru (public administration), Uruguay (production sectors), and Bolivia (policy and strategy tools). In the process leading up to the Conference ECLAC supported a series of consultations with experts from governments, academia, the private sector and civil society. The outcome of the consultations was the eLAC Policy Priorities Delphi2, which forms the basis of the eLAC2010 policy recommendations. The development of elac2010 was notable for its multi-stakeholder consultation process and its efforts open up the process to broader consultations, soliciting the observations of governments and non-governmental organizations by email or by fax. These inputs were published once a week on the Ministerial Conference website. Experts throughout the region made 1,454 contributions and 14 international organisations contributed actively through both on-line and off-line consultations.

In February 2007, just prior to the Ministerial meeting, ECLAC, UNDESA, IDRC and GAID held a launch seminar for GAID regional network which brought together 100 ICT4D experts to present proposals on the role of ICT in poverty eradication, health, education, youth employment and e-government. During 2007, ECLAC organised a series of four seminars in Santiago in September 2007, which gathered more than 500 stakeholders, representing governments, NGOs and the private sector. These seminars were on e-Government Interoperability, Latin American Encounter of Telecenters and Social Inclusion 2007, Multi-stakeholder consultation, and the Millennium Goals and ICT.

The 17th Electronic Commerce Steering Group (ECSG) meeting took place in Lima in February 2008 under the ICT-Enabled Growth Initiative, a collaboration between APEC economies and the private sector, represented by the International Chamber of Commerce and ABAC which aims to help create policy tools to promote the use and development of ICTs as a means to enhance capacity to participate in the global digital economy. The meeting proposed the development of a checklist of five main areas (the Five I's) that need to be addressed in such frameworks: Infrastructure, Investment, Innovation, Intellectual capital and Information flows.

In 2007 IDRC continued to support the work of a regional network of researchers in ICT policy and regulation called DIRSI[98] (Regional Dialogue on the Information Society). The project aims to stimulate economic assessments of the impacts, benefits, and costs of governance and regulatory reform, and ICT diffusion in households and communities.

Western Asia
While many countries in the region have to some degree independently pursued the goal of achieving an enabling environment for ICT uptake, ESCWA notes that laws and regulations relating to intellectual property rights (IPRs), independent regulatory bodies for the ICT sector and cyber legislations are still in their infancy in the region, with regional coordination lacking. To assist with ICT policy making, in 2007 ESCWA published "Guidelines for the Formulation and Implementation of ICT Strategy", and the

---

[98]   http://www.dirsi.net

2007 edition of the "Regional Profile of the Information Society in Western Asia"[99], which contains national profiles on all WSIS action lines as well as ICT advances related to achieving the MDGs.

The 13th meeting of the Arab Working Group (AWG) on ICT Strategy took place in Cairo in March 2008. In 2007 the AWG had formulated the Arab Information and Communication Technologies Strategy for Building the Information Society (2007-2012) and adopted a set of indicators for measuring progress. The meeting developed criteria for selecting regional projects and discussed the proposals of ESCWA and Iraq which specify for each objective of the strategy: actions, expected accomplishments and indicators of achievement. A Plan of Action was formulated that will be submitted to the Arab Telecommunications and Information Council of Ministers for adoption during their meeting in June 2008. ESCWA will cooperate with the League of Arab States for hosting the Arab ICT strategy and its Plan of Action on the ESCWA Information Society Portal.

As referred to above under C5, ESCWA commissioned a study on models for cyber legislation, which reviews the status of local and international laws governing cyber legislation within the ESCWA region, in order to enable policy makers and legislative bodies to determine priorities for their jurisdiction.

C7 ICT applications
While most activities in this action line have focussed on support for specific ICT application areas, some activities have covered more general issues around ICT application development. In addition, because of the cross-cutting nature of ICTs, activities listed under a particular category in this Action Line could have relevance for other categories.

While the ITU ICT Applications' Work Programme to Assist Developing Countries (2007–2009) is still currently being developed, ITU has established new websites gathering key resources on e-services/applications, e-government, e-health and e-environment.

In November 2007, UN-HABITAT hosted the UN's annual Web for Development Conference in Nairobi. The conference brought together some 300 participants from UN agencies, governments, civil society, the private sector and local authorities to discuss how the Internet can be used to accelerate achievement of the Millennium Development Goals.

IDRC has extended its Information Society Innovation Fund (ISIF-Asia) in 2007 which is designed to provide seed funding for grants that develop innovative ICT solutions that address pertinent issues in education, health, governance and livelihoods in Asia.

C7 E-government[100]
Intranets and general purpose applications such as email and instant messaging have been adopted by virtually all central governments, but these have yet to reach all levels of local government in most developing countries. Developed countries have made the most advances in providing e-government services to the public, although they also have some way to go. As an indication, it was estimated in 2007 that 60% of public services in the European Union are fully available online, although deployment

---

[99] E/ESCWA/ICTD/2007/15 - http://www.escwa.un.org/wsis/profiles.html
[100] Some activities in C7 e-government are also often associated with Action Line C1 on the role of public governance authorities, and vice versa. Similarly, e-education and e-health can be seen here, because public services are also sometimes grouped under e-government.

is uneven across the countries in the region. While in some countries – Austria, Czech Republic, Malta, Portugal – 100% of basic public services for businesses can be fully transacted online, others lag behind (Bulgaria, 15%, Poland, 25%, Latvia, 30%). To help address this, the European Commission will launch large-scale projects to support pan-European public services such as cross-border operation of electronic identity or electronic signatures in mid-2008.

The 2008 UN e-Government Survey[101] assessed the 192 UN member states on their application of information and communication technologies (ICTs) to serve and interact with citizens. The survey found there were large differences between the five regions, with Europe (0.6490) having a clear advantage over the other regions, followed by the Americas (0.4936), Asia (0.4470), Oceania (0.4338) and Africa (0.2739). Asia and Oceania were slightly below the world average (0.4514), while Africa lagged far behind. This year, Sweden (0.9157) surpassed the United States as the leader. Three Scandinavian countries took the top three spots, with Denmark (0.9134) and Norway (0.8921) in second and third place respectively. The United States (0.8644) came fourth. European countries made up 70% of the top 35 countries while the Asian countries made up 20%. No countries in the top 35 from the African, Caribbean, Central American, Central Asian, South American and Southern Asian regions.

Currently the most commonly found e-government application development projects in developing countries relate to: 1) networking government departments, 2) establishing network links between government departments and extending these to the municipal level, the police, immigration control, and health and education institutions, 3) developing standards for interoperability between government departments, 4) customs automation, 5) government accounts and human resource management, 6) GIS and digital cadastral survey data for land-use planning 7) public access facilities support and public information outreach (web sites).

In 2007 DESA produced two tools on e-government. One was a *Compendium of ICT Applications on Electronic Government: Volume 1[102],* which focuses on more than 130 software applications for education and health. METER2, a ready-to-use interactive web-based tool, designed to assist governments in monitoring and refining the enabling environment for e-government, is currently being developed in collaboration with the State University of New York at Albany and Microsoft Corporation.

DESA also carried out several e-government projects in the Caribbean region, including a cooperative project that will lead to the transfer and implementation process of Jamaica's Customs Automated Services (CASE) solution in Antigua & Barbuda. At the national level, DESA worked with national governments on e-government solutions in Belize, Morocco, Saint Lucia, and Saint Vincent and the Grenadines, and Lesotho.

UNCTAD's customs reform and automation programme, ASYCUDA underwent a system upgrade in 2007 and was expanded to include new members, including the Palestinian Authority, the Commonwealth of Puerto Rico, and the governments of Georgia, Yemen, Zimbabwe, Haiti, Côte d'Ivoire, Jordan, Lebanon and the Syrian Arab Republic. The ASYCUDA system went live in the Democratic Republic of Congo, Eritrea, St. Vincent and the Grenadines, Seychelles, and Trinidad and

---

[101]   http://www2.unpan.org/egovkb/global_reports/08report.htm
[102]   http://unpan1.un.org/intradoc/groups/public/documents/UN/UNPAN028661.pdf

Tobago. In 2007, the ASYCUDA Programme also created regional support and maintenance centres to facilitate regional integration.

The UNDP Oslo Governance Centre's Access to Information (A2I) programme has increased from 69 projects in 2003 to 279 in in 60 countries in 2007. This includes both direct support, such as for the development of independent and pluralist media, and projects where access to information is a component of other democratic governance initiatives, such as legislation support or justice initiatives. Currently, most projects are carried out in the Arab and Europe-CIS regions. In 2007 there was a substantial increase in projects related to communication mechanisms for vulnerable groups. The Oslo Governance Centre is also continuing to support the Communication Initiative (CI) - an online space for sharing experiences and building bridges between people and organisations supporting communication as a fundamental strategy for development.

The UNDP's Democratic Governance Group (DGC), published its annual report in 2007 which highlighted improving access to information and strengthening media in post-conflict situations. The DGC is composed of policy advisors, research analysts, programme managers and knowledge management professionals at UNDP agencies around the world. The DGC hosts the Democratic Governance Network (DGP-Net), which connects people through an online interactive knowledge sharing platform, was one of the most active knowledge networks in UNDP, responding to 145 queries and requests from the larger Community of Practice.

In October 2007 South Korea announced the establishment of an ICT trust fund with the World Bank to provide $15 million over the next three years on a grant basis to projects worldwide, with the possibility of further contributions depending on progress. The fund will support integration of ICT into the delivery of government services, and to help small- and medium-sized enterprises in developing nations.

The European Commission presented the results of its ERINA project, at the e-IRG Open Workshop on e-Infrastructures in Lisbon in October 2007. ERINA analysed the role of e-Infrastructures to bring innovation to key ICT areas, in e-government, e-health and e-learning. The study surveyed over 300 existing use cases – in the health, public sector and learning domains and recommended various actions for fostering adoption to the European Commission and national governments.

In Africa, to raise awareness about the information society and promote the sharing of good practice examples, ECA initiated several programmes in 2007, including the *Technology in Government in Africa (TIGA) award,* a joint initiative of ECA and the Government of Canada, to recognised achievements that have led to e-government changes at national, regional or provincial level. The award covers four categories: public service delivery to citizens or communities; improved health services through the use of ICT; improved educational services through the use of ICT; and public private partnership in economic and financial e-services delivery. The 2007 award was won by Al-Akhawayn University for its eFez municipal e-governance project, supported by IDRC.

In March 2008 the Netherlands-based foundation IICD signed an MOU with the French Altran Group to send employees to development projects in Africa focusing on sharing knowledge and expertise in the field of e-governance.

In public management, the elac2010 goals seek to promote the interoperability of standards-based e-government systems in Latin America and the Caribbean, and to ensure that 80% of local governments interact with citizens and other branches of the public administration via the Internet.

C7 E-Business
In the context of the global business opportunities that are now becoming available through the Internet, it is noteworthy that despite low levels of Internet penetration, some of the larger low- and middle-income countries such as China, India, South Africa and Nigeria now have bigger online populations (by number of Internet users) than some of the smaller developed economies, such as Ireland or Belgium.

In 2007 UNCTAD continued to support the efforts of developing countries in e-business development, in particular among SMEs, in sectors of economic importance and with export capacity, through a mix of sector-specific policies, training programmes and deployment of ICT tools. UNCTAD's Information Economy Report 2007 studied trends in e-business and the appropriate policy environment to increase the diffusion of ICTs in business and its positive impact on enterprise competitiveness.

In May 2007 UNCTAD, ILO and ITC jointly organised a facilitation meeting on "E-business and E-employment" on the theme of "ICTs, Global Supply Chains and Development" in Geneva. The meeting explored the role of technology and innovation in supply chains, the measures that policy makers and enterprises can adopt to exploit the opportunities of greater market access and strengthen enterprise competitiveness, the labour market implications and the costs and benefits of such changes.

A report on **"**E-shopping through Posts: A key opportunity for the postal sector in the Information Society**"** was released by the Universal Postal Union (UPU), which identified ways the postal sector and the UPU could contribute to the growth of e-business. In April 2007, the UPU approved *The UPU E-services strategy: Facilitating communication between the inhabitants of the world*, expected to be implemented through an Action Plan to be approved by the UPU Congress in August 2008. UPU signed a Memorandum of Understanding with ITU in July 2007 to enhance cooperation and coordination between the two organisations. UPU projects are under way in Afghanistan, Nepal, Bhutan and Southern Africa with the objective of enhancing the physical infrastructure of the postal network with ICT connectivity and related training using post offices as telecentres. Priority attention was given to the development of UPU's worldwide electronic payment network in Africa. Altogether, 29 African countries are currently equipped with the UPU's International Financial System (IFS) applications. UPU has also been working with the International Fund for Agricultural Development (IFAD) and the International Organisation for Migration (IOM) to make available affordable remittances for migrants based upon advancements in ICT in the postal network. UPU is working with UNCTAD, WCO and the International Air Transport Association (IATA) to ensure that interoperability of transportation and customs clearance system helps remove barriers to cross border movements related to e-commerce growth.

The UN Centre for Trade Facilitation and Electronic Business held its 11th UN/CEFACT Forum in Stockholm in September 2007. The meeting highlighted the importance of global standards and brought the various UN/CEFACT working groups together to focus on facilitating transactions and e-procurement through the simplification and harmonisation of processes, procedures and information flows. At the meeting publication of three new UN/CEFACT e-business standards were announced —

the eTendering Standard for Public Procurement, the Project Schedule and Cost Performance Management Standard and the Small-Scaled Lodging House Standard.

The ITC's Trade at Hand initiative expanded in March 2008 to include Senegal in collaboration with the Senegalese exporters association, ASEPEX. The project provides small exporters with access to a selection of fruit and vegetable prices via mobile text messages. Business opportunities, contacts and market news are also provided. Tradenet.biz, a regional mobile2mobile trading platform for farmers and traders expanded in 2007 to include Tanzania in March 2008. The concept is to improve intra-regional trading by making markets more transparent and efficient and providing sufficient information to make better decisions on bringing products to market.

*info*Dev, in partnership with the Overseas Development Institute (ODI) and the Institute for Development Studies (IDS), are currently compiling a "Knowledge Map" on the contribution made by ICT to the livelihoods of the rural poor. Donors and policy makers are being encouraged to complete a brief survey.

In Europe progress towards paperless trade was made with the publication in 2007 of the electronic Cross Industry Invoice and the Business Requirements Specification of the UN electronic trade documents project, UNeDocs. Progress was also made in making border crossings easier, faster and more secure through the computerisation of *Transports Internationaux Routiers* (TIR) carnets, over three million of which are issued every year. In March 2007 the Payment Services Directive was adopted by the EU Council of Ministers which will put in place (by 2009) new EU rules to allow alternative providers such as mobile phone operators to deliver new payment services alongside banks and credit card firms, paving the way for a more efficient non-cash economy. The PSD aims to create a true European market for payments, improving business and offering consumers more and cheaper services. By end of 2010 European businesses and consumers will be able to use a single bank account regardless of their country of operation.

In Africa, ECA undertook a six–country[103] study on ICTs, trade and economic growth aimed at building capability and capacity in creating policy frameworks for use and adoption of ICTs in trade. In March 2007, UNIDO and Microsoft launched the prototype of a web-based technology solution, which is a key component of the monitoring platform for the Africa Investment Promotion Agency Network (AfrIPANet). The network is comprised of Investment Promotion Agencies (IPAs) from countries of the region with ongoing UNIDO integrated programmes (IPs).

ESCAP promoted the sharing of good practices through a regional workshop, and provided support to pilot projects in four countries[104] for the development of e-business services for Small and Medium-sized Enterprises (SMEs). It also promoted entrepreneurship and e-business for women in rural cooperatives through regional workshops, training and developing guidebooks. ESCAP also organised the 6th international forum on online dispute resolution in Hong Kong, China, in December 2007. In March 2007 in Sabah, Malaysia, UNCTAD organised a sub-regional ministerial conference on "Asia-Pacific: E-tourism for Growth: Matching market efficiency and social inclusion", which focussed on e-Community tourism and was represented by 22 countries as well as ESCAP, UNDP, UNWTO, ADB and several development agencies.

---

[103]   Egypt, Ethiopia, Ghana, Kenya, Senegal and South Africa
[104]   China, Cambodia, Lao People's Democratic Republic and Vietnam

The Committee on Trade and Investment (CTI) prepared the APEC's Second Trade Facilitation Action Plan endorsed by Ministers Responsible for Trade in July 2007. This plan sets out a framework and timetable for achieving a further five percent reduction in trade transaction costs by 2010. It focuses on customs procedures, standards and conformance, e-commerce and mobility of business people. Also, the APEC Sub-Committee on Customs Procedures (SCCP) adopted the Single Window Strategic and Development Plans in June 2007. The Strategic Plan provides a framework for the development of Single Window systems by members to achieve paperless trading targets and enable seamless data sharing. It contains six recommendations to assist members in this endeavour and provides the mechanisms for APEC members to work collaboratively. Model measures for e-commerce were developed and adopted in 2007. The APEC Symposium on Paperless Trading Capacity Building and Intellectual Property Protection took place in Beijing in August 2007. The event produced a series of recommendations to facilitate paperless trading: 1) a roadmap towards paperless trade capacity building and intellectual property protection on APEC; 2) a framework of intellectual property resources related to paperless trading; 3) a directory of APEC paperless trading products and APEC intellectual property resources related to paperless trading; and 4) a Digital Rights Management Promotion Committee of APEC E-Commerce Business Alliance. The APEC Training Program on E-Trade and Supply Chain Management held its second training course in Sanya, China in March, 2007. The training aimed to raise the awareness level and understanding, knowledge and skills of e-trade and e-commerce through education among APEC members, especially developing member economies, in particular so that strengthened bilateral or multi-lateral trade development among APEC member economies is reinforced.

To promote regional coordination in Western Asia, ESCWA produced a study on models for cyber legislation, which reviews the status of local and international laws governing cyber legislation within the ESCWA region. A consultative meeting was organised in Amman during December 2007 to review the study and produce regional cyber legislation templates as a step towards regional directives.

Currently it is estimated that about 3% of GDP is consumed in the costs of current payment systems. Online transactions - e-commerce - are reducing this considerably, but still mostly occurs in developed countries. For example the e-commerce transaction in the US grew to USD 136 bn in 2007, up 19% from 2006, and in Europe in 2007 it was found that 77% of businesses use the Internet for dealing with banks.

In developing countries, aside from limited access to the Internet, users also often lack access to credit cards or other means of payment. However e-commerce applications and the ability to transfer cash via mobile phones (m-commerce), is becoming more widely available, which should see developing countries catching up. These range from using Internet-capable phones for access to the web, to more specialised applications often developed in partnership with local banks which allow local mobile banking and e-payments to be made. A global survey in 2007 found that over half of the banks interviewed will offer mobile services in the next 12-24 months and the global m-commerce market is expected to be worth USD 88bn by 2009. The number of m-commerce users in Asia is expected to increase to 28 million in 2008 (from 6 million in 2006).

International mobile phone e-payment systems are also being developed which are expected to cut the current costs of sending remittances considerably. By some estimates[105] this could double the number of recipients to 1.5 bn people while helping to quadruple the size of the current international remittances market (USD 240 bn in 2007) to more than USD 1 trillion by 2012. The recent growth in web-based micro-lending applications such as Kiva is likely to further accelerate the flow of funds into developing countries.

Paperless trading systems are also on the increase. In the APEC region seventeen economies have now prepared Paperless Trading Action Plans which outline the steps necessary to meet APEC's target to reduce or eliminate customs, cross-border trade administration and other transport documents. In 2007 the Asia-Europe Alliance for Paperless Trade (ASEAL) was joined by Malaysia and six other countries (Luxembourg, Morocco, Senegal, Spain, Thailand and Vietnam) joined the alliance as observers.

Services to provide market information on agricultural products and inputs, such as the ITCs Trade at Hand system, Tradenet.biz and Reuters Market Light, were launched in a growing number of developing countries in 2007, including India, Senegal and Tanzania.

In April 2007 the ILO published a study titled "Combining micro insurance and new technologies to protect the poor"[106]. The study concludes that to fulfil the potential of micro insurance in protecting the poor, it is necessary to develop an insurance culture among the low-income market and introduce products that meet their primary needs. Information technologies, including smart cards, bar code systems and the Internet could contribute significantly to expanded outreach, better products, cost cutting, and the sustainability of providers.

In 2007 micro-lending gained attention as a particular area that has benefited from the development of online initiatives. Among the most well known examples is Kiva.org which operates a web site that allows any individual to make micro loans to specific individuals and projects. Kiva partners with micro finance institutions around the world (60 partners in 36 countries) that identify potential borrowers whose needs are posted on Kiva's Web site. By 2008 the fund had about USD530mn deployed to 410 credit banks and almost 220 cooperatives, which work directly with the borrowers. The online auction company eBay, which recently bought PayPal, also entered the micro finance market in October 2007 when it acquired MicroPlace, a web-based brokerage firm where loans made through the company earn interest and can be traded.

C7 E-learning
E-learning activities are also often incorporated within the activities of other Action Lines.

Most developing countries have now established, or are in the process of developing strategies for the incorporation of ICT in their education systems, and some countries have detailed implementation plans with targets and measurable indicators in place. Access for secondary and tertiary education institutions is now growing rapidly in urban areas through wireless networks and improved access to fibre optic infrastructure. Of particular note are the new targets in the eLAC2010 strategy which increased targets to connect schools from the 30% in the 2007 strategy to 70% by 2010. The NEPAD e-Schools

---

[105]   http://www.theregister.co.uk/2007/02/13/mobile_money_transfer
[106]   http://www.ilo.org/global/About_the_ILO/Media_and_public_information/Press_releases/lang--en/WCMS_082345/index.htm

programme which will assist African countries in bringing 600 00 schools online. At the higher education level, National and Regional Research and Education Networks (RENs) continued to form in 2007 to enable better access to learning materials by students and increased collaboration between researchers by improving the bandwidth available to academic institutions. A notable example is the UbuntuNet Alliance, a consortium of NRENs in Eastern and Southern Africa which was linked in February 2008 to the global academic networks via a 1Gbps fibre link from member NREN TENET in South Africa to Europe's regional research network, GEANT.

Currently the predominant use of ICTs at school level has mostly focused on the development of operational ICT skills than on the integration of ICT in pedagogical practice (e-learning), although this is also now receiving more attention, underscored by the increased adoption of learning management systems such as the UNESCO supported Moodle. Nevertheless state education systems often lack financial and technical resources to provide widespread access to e-learning. Meeting the ongoing costs of maintaining equipment, staff training, connectivity, content materials acquisition and consumables is a major challenge. In addition, while initiatives to develop on-line repositories of freely available learning materials are becoming more commonplace, the lack of local digital content in developing countries, especially in indigenous languages, continues to be a general problem, and there is currently substantial reliance on content from the private sector.

During 2007, UNESCO supported e-learning initiatives in Africa, the Arab States, Asia and the Pacific, Europe, Latin America and the Caribbean, for both formal and non-formal education. UNESCO offered capacity development opportunities on the use of ICT for education, targeting Ministries of Education, higher education institutions, teachers and educators in community learning or multimedia centres. At the end of 2007 UNESCO launched the ICT Competency Standards for Teachers, which define the range of skills needed for teachers to effectively integrate ICT in the teaching process. The Standards also provide modules for training, and emerged from multi-stakeholder collaboration between UNESCO, Microsoft, Cisco and Intel, the International Society for Technology in Education and the Virginia Polytechnic Institute and State University.

In March 2007 UNESCO launched an online collaborative knowledge hub for training and capacity-building resources for development. The Platform is a resources directory with relevant resources on local development and poverty reduction. It provides 1700 free training resources from over 630 development stakeholders, including all UN agencies. In April 2007 UNESCO, *info*Dev and partners announced version 2.0 of the ICT in Education Toolkit for Policymakers, Planners and Practitioners. Under development by UNESCO-Bangkok and its partners (AED and Knowledge Enterprise) since 2004, *info*Dev began actively supporting the Toolkit in mid-2006 as part of a larger strategic and operational partnership with UNESCO. Beta versions of the Toolkit have been used as part of country planning exercises in Asia and the Pacific Island nations, and the Toolkit will now be used in country and regional workshops in 2008. Version 2.0 includes the ability to plan for multipl[107]e projects within a single country simultaneously, conduct surveys, an off-line version on CD and a variety of security enhancements.

In September 2007, the Open Society Institute (OSI) and the Shuttleworth Foundation convened a meeting in Cape Town to gather leading proponents of open education. Participants were educators, foundations and internet pioneers, who proposed the Cape Town Open Education Declaration[108] which

---

[107]   http://www.infodev.org/en/Publication.353.html
[108]   http://www.capetowndeclaration.org

urged governments and publishers to make publicly-funded educational materials available freely over the internet. The Declaration also encourages teachers and students around the world to join a growing movement to use the web to share, remix and translate classroom materials to make education more accessible, effective, and flexible.

In October 2007 *info*Dev published A Survey of ICT and Education in Africa, based on 53 Country Surveys. The survey aimed to gather together in a single resource the most relevant and useful information on ICT in education activities in Africa.

More than 1400 participants took part in the second eLearning Africa[109] conference in Nairobi in May 2007. The commercial event brought together academia, business, civil society and governments, and with nearly 80 percent of the participants coming from Africa and a participation by African Ministries of Education.

In October 2007 the Asian Development Bank (ADB) hosted a conference in Manila on Optimising ICT for Education, Sharing Practical Experiences from the Asia and Pacific Region. The event aimed to address a range of current ICT in education issues, lessons learned, and best practices[110].

The Latin American Network of Educational Portals[111] (RELPE) was launched in 2007 aiming to encourage the free circulation of locally produced educational and improve quality and equity in education through the innovative application of ICTs in the education sector. The initiative will develop both the institutional linkages and compatible software enabling content contribution and sharing. Currently the focus is on primary and secondary education content, with plans to expand to the tertiary (university and college) sector.

C7 E-health

In developed countries, the use of ICTs in health systems (e-health) has rapidly evolved from the delivery of online medical content toward the adaptation of generic e-commerce solutions to the processing of health-related administrative transactions and logistical support of clinical tasks. As a result the global demand for telehealth services was estimated to be about USD 1.25 trillion in 2007, of which about two-thirds is for direct services and the rest for second opinion, consumer information, continuing education, management, and other services. Emerging e-health applications are oriented to professional networking, integration of the clinical care process management, and the provision of Web-based health information and patient care, including remote monitoring. In Europe, a 2007 survey found that 57% of doctors now send or receive patients' data online, compared to 17% in 2002, while 46% receive results from laboratories electronically compared to 11% in 2002.

In low-income countries, the lack of a pervasive national ICT infrastructure has limited the application of e-health mainly to telediagnostic activities, such as using email to transmit medical images, medical transcription, and the use of mobile phones to manage patient care or to receive the results of medical tests. Most existing information systems in these countries and in many middle-income countries are inadequate to meet the requirements of e-health. However another limiting factor is that in low-income countries health-information systems are mostly seen as a source for scientific and technical information, rather than a valuable tool for health systems management.

---

[109]   http://www.elearning-africa.com/
[110]   http://www.adb.org/Documents/Events/2007/Optimizing-ICT-Education/default.asp
[111]   http://www.relpe.org

Handheld computers have, however, been deployed to help gather health information in a number of developing countries, including Uganda, Madgasacar and Mozambique. These systems improve the accuracy and speed with which public-health data is collected. In Latin America, the MeDNet project[112] is developing a medical network that aims to help provide health care from a distance. Supported by expert physicians located in the larger cities, the medical applications will vary from cardiology, gynecology and pediatric, to typical infectious diseases such as malaria and tuberculosis. The process involves an ultrasound examination, ECG test and blood test, and blood test imaging for automation diagnosis. All the patient information from the examinations is stored in a health care database, along with demographic information and medication prescription. MeDNet is also making use of the AmerHis satellite communication system to allow remote doctors to share information and request assistance.

WHO's Global Observatory on e-Health continues to monitor, analyse, and report on developments and trends in e-Health worldwide. The second global survey on e-Health is planned to be conducted in 2008 and the results published in early 2009. Building on the first global survey, it will explore in more detail areas such as policy, partnerships, infrastructure, funding, capacity building and the adoption of e-Health applications. The next two years will also see the extension of the Observatory with the establishment of national observatories in participating countries which monitor and report e-Health developments at the national level as well as promote findings to key country stakeholders. A number of WHO's programmes, undertaken in partnership with the private sector, respond to the call for improving access to the world's health information. Chief among them is the Health InterNetwork Access to Research Initiative (HINARI),[113] which provides free or low cost online access to major journals from over 70 publishers in biomedical and related social sciences to local, not-for-profit institutions in developing countries.

To improve national health information systems, WHO has set up the Health Metrics Network (HMN)[114] and the planned African Health Infoway[115], in partnership with member states, other international organisations and the private sector. An important milestone for strengthening health information systems was reached when the World Health Assembly in May 2007 called on health information and statistical communities, international organisations, global health initiatives and other stakeholders to "provide strong, sustained support for strengthening health information systems". During 2007 HMN developed the second edition of its Framework and Standards, which is increasingly adopted as a technical guide. Sixty-two countries have so far received grants for intensified efforts to strengthen their health information systems with HMN and partner support.

e-Health is one of the priorities of the European Union's i2010 programme to boost innovation and jobs, which aims to provide user-friendly and interoperable information systems for patients and health professionals. In July 2007 the European Commission published draft recommendation on e-Health interoperability[116]. The EC observed that regional health networks, electronic health records and deployment of health cards have contributed to the emergence of an 'e-Health industry', which has the potential to become the third largest industry in the health sector, after the pharmaceutical industry and the medical device and imaging industry. The European Commission also carried out a pilot on e-Health

---

[112]   http://www.e-mednet.com/
[113]   http://www.who.int/hinari/en/
[114]   www.who.int/healthmetrics
[115]   www.who.int/kms/initiatives/ahi/en/index.html
[116]   http://ec.europa.eu/information_society/newsroom/cf/document.cfm?action=display&doc_id=369

indicators: 'Benchmarking ICT use among General Practitioners in Europe' which surveyed electronic services supporting healthcare. The study report published in April 2008 showed that eHealth applications have a growing role in the doctor's practices but there remain significant country differences in their availability and use across Europe.

In Africa, ECA, in collaboration with WHO and the government of Canada, commissioned a joint regional needs assessment and scoping study on the African Health Infoway: a district-based public health information network and geospatial health system for African health. The first report on the needs assessment undertaken in Kenya, Mozambique, Rwanda, Swaziland, Tanzania and Uganda was published in 2007.

A pan-African telemedicine project was launched in Addis Ababa in July 2007 which establishes satellite links between hospitals in Africa and India's leading health institutes. The USD136mn scheme is a joint initiative between the African Union and India.

ESCAP with the support of OOSA organised a regional expert meeting on Using Space Technology for Avian Influenza Monitoring and Early Warning in Asia in 2007. The Meeting established a working group to further develop operational models for avian influenza monitoring and early warning by use of remote sensing and GIS technologies, and to develop a network mechanism of national avian influenza control authorities and supporting institutions, as the basis for an information system for avian influenza at the global/regional/sub-regional levels. WHO and FAO expressed their supports to this effort by provision of their relevant data and information.

A project to develop electronic health delivery using open source software (FOSS) and Personal Digital Assistants in Argentina and Columbia was established the University Austral of Argentina with support from IDRC. Researchers will develop an electronic clinical registry based on FOSS compatible with international health data standards and devise indicators for measuring the cost-effectiveness and impact of healthcare delivery using ICTs.

APDIP published e-Note 22 on e-Health in 2007 which provides an overview of the benefits and challenges of some of the most used e-Health tools. Lessons learned in e-Health in the Asia-Pacific region are highlighted through three case studies from Indonesia, Philippines and Thailand. The APDIP e-Note also examines different approaches to e-Health, such as the use of free and open source software and the relationship between e-Health and the Millennium Development Goals.

USAID completed demonstrations in 2007 which showed that ICT-based field surveillance of health threats can demonstrate the benefits of ICT for advancing health solutions. In support of this, USAID conducted research which concluded that a number of Health Management Information Systems that could be used for an Avian Influenza initiative, and these could also be expanded to cover other public health risks. However, there are common challenges among theses solutions, such as prohibitive costs and overly-complex business model or technical systems that cannot be easily understood and implemented in the developing country context. As a result the USAID supported the development of a "Spot Map" prototype, which can compile and report epidemiological evidence using PDA and/or cell phone based technologies. After field testing in Madagascar, the Spot Map will be provided in other countries in the Asia Near East (ANE) and Africa (AFR) regions.

A similar e-health project continues to be funded by IDRC which supports the use of computers and handhelds and wireless technologies to gather health information and to establish national health Management Information Systems (MIS). This has led to an international collaboration of individuals and institutions known as OpenMRS[117] which is developing the core application. A network of implementers is configuring specific implementations of OpenMRS for treating and managing care for patients with HIV/AIDS and tuberculosis at sites in Eastern and Southern Africa.

The European Commission's eHealth ERA programme published[118] a report and survey on eHealth priorities and strategies in 32 European countries in April 2007. During 2007, the European Union has been supporting three pilot projects which demonstrate the potential of satellite based technology to extend the reach of health services in Africa and to complement other forms of ICT in support of e-Health. Medical eContent will be delivered via satellite. Satellite-based clinical services for remote areas will be tested, and electronic communications between healthcare facilities in a isolated areas with high burden of diseases (for example HIV/AIDS, tuberculosis and malaria) will be established with medical centres of excellence in Africa. The projects will be used to inform further funding under the 10th EDF to extend the reach of health and health services on the continent. The European Union is also supporting a project to promote e-Health practice in the East African Community (EAC) through the establishment of a Regional Integrated e-Health Management Information System (RIHMIS) and Geographical Information System (GIS) database and ICT infrastructure in the region. The third meeting of the Telemedicine Task Force (TTF) took place in Gabarone in March 2007 and it is planned to connect key database servers within East Africa through a Wide Area Network (WAN) secured by Virtual Private Network (VPN) technology. The network will be used to promote Integrated Disease Surveillance (IDS), Health Early Warning Systems (HEWS) and other disease control activities in a standardised way.

The elac2010 strategy identifies the use of ICTs in health as a lagging area which requires greater efforts in order to achieve the modernization of health services. Aside from promoting the integration of ICTs into the health sector and the encouragement of public policies in this area, eLAC2010 places emphasis on the task of linking national health portals with a view to establishing a regional network that can be used to share experiences.

The MedNET kick off meeting took place in Darmstadt in March 2008. MedNET[119] is establishing a framework in Latin America to promote access in underserved regions to high quality medical resources. A healthcare database and medical platform will focus on patient safety by enhancing clinical services and improving the primary healthcare in pilot locations using diagnosis and treatment methods, collection and sharing of data on treatment outcomes and patient demographics. The system is based on European medical protocol and standards for medical information exchange.

C7 e-Employment
A variety of national initiatives to promote employment through teleworking have taken place in 2007, which also address Action Line C7 on e-environment due their effect on energy consumption through reduced travel.

---

[117] http://www.openmrs.org
[118] http://ec.europa.eu/information_society/activities/health/docs/policy/ehealth-era-full-report.pdf
[119] http://www.ehealthnews.eu/content/view/1087/66/

In Latin America IDRC is continuing a regional initiative on Telework, New Forms of Work and Employment which is supporting research into a wide variety of telework issues, including case studies in Argentina, Brazil, Colombia and Costa Rica.

In May 2007 ECA launched the e-Employment in Central Africa pilot phase in three countries (Congo, Gabon and Cameroon) to assist youth in obtaining jobs through access to ICTs. With support from ECCAS, UNDP and local partners, the project will support building capacity to search and prepare interviews, provide access to a multimedia centre and provide timely information on job opportunities. At the launch 120 young graduates were enrolled.

Opportunities for disabled people provided by teleworking was the subject of an EU report in November 2007 on: Improving Disabled People's Access to the Knowledge Based Society. The report was designed to aid further understanding of the need for eAccessibility in furtherance of EC ambitions within its employment and social policy fields.

A number of national online portals for recruiters and job seekers have continued to be launched in 2007 as a more efficient means of for employers to identify potential employees.

C7 E-environment
The World Meteorological Organisation (WMO) continues the development of a coordinated global information infrastructure, the WMO Information System (WIS) as an initiative to use ICTs to monitor, prevent and mitigate natural disasters. WIS builds upon the components of existing WMO information systems, and is expected to be a major component of the Global Earth Observation System. A Global Telecommunication System (GTS) for the exchange of time-critical and operation-critical data will be implemented by the WMO Members. In the Indian Ocean, several GTS centres' systems were upgraded and training activities organised to provide an effective support to the operation-critical exchange of multi-hazard warnings, especially for Tsunami and tropical cyclones.[120] In 2007, several WMO Members implemented pilot projects for data recovery, access and retrieval services. The project is expected to be operational from the end of 2008.

ITU is undertaking new scoping studies and policy reviews of available reference materials and guidelines to support national decision-making and implementation of ICT applications and services in the areas of e-environment which will be made available in early 2008.

A new phase of the Aarhus Clearinghouse for Environmental Democracy[121] was launched in May 2007 at the UNCSTD's side-event on The Information Society - From Declaration to Implementation. The upgraded global web portal's new features include an improved Resource Directory with more than 1000 sources of information. The Aarhus Clearinghouse promotes the exchange of information on implementation of the Aarhus Convention and principle 10 of the Rio Declaration for Environmental and Development. UNEP GRID-Arendal partnered with UNECE on the upgrading of the Clearinghouse.

---

[120] Including Madagascar, Tanzania, Kenya, Pakistan, Maldives, Sri Lanka, Bangladesh, Myanmar, Thailand and Indonesia.
[121] http://aarhusclearinghouse.unece.org/help.cfm

ESCAP conducted a study in 2007 to review the modalities for strengthening regional coordination and cooperation in natural disaster information management and early warning in the Asia the Pacific region, as well as assess the needs for and feasibility of establishing a regional centre for information, communication and space technology-enabled disaster management. ESCAP is also working closely with the International Centre for Drought Disaster Reduction, which is established by ISDR and hosted by China, in the development of regional cooperative mechanism on drought disaster monitoring and early warning using space technology for the Asia-Pacific region, including sharing of operational space information products and services for drought disaster monitoring and early warning, and to explore the possibility to extend existing national services to cover neighbouring countries.

United Nations organisations and partners in the Group on Earth Observations held its 27th session in January 2007. The meeting reviewed the participation of the United Nations system in the process and the organisations endorsed the Services Oriented Architecture concept as the basis for the GEOSS architecture. This will ensure a common approach to enhance access to data and information through interoperability arrangements that are uniform across the diverse component systems that comprise GEOSS.

UNOOSA is implementing the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) which was established by the United Nations General Assembly in December 2006. This programme is helping to provide universal access to all countries and all relevant international and regional organisations to all types of space-based information and services in support of the full disaster management cycle. In 2007 a first UN-SPIDER office was opened in Bonn (Germany). Further offices will be opened in 2008 in Beijing (China) and Geneva (Switzerland). Additionally, UN-SPIDER will have the support of a Network of Regional Support Offices which will ensure that all countries benefit from the space-based technologies for disaster management.

In 2007, the ECE Working Group on Environmental Monitoring and Assessment established a task force to: (i) review the collection of meta information on available sources of environmental information and activities in EECCA countries, (ii) develop practical tools and instruments using ICTs to improve the use and exchange of information in these countries, and (iii) harmonise their approaches with those applied within the European Environment Agency (EEA) networks.

As part of a new initiative on ICTs and climate change, ITU has been organising two symposia. The first was held in Kyoto, Japan in April 2008, hosted by MIC Japan, and the second will be held in London, on 17–18 June, 2008 hosted by BT. Supplemented by the publication of the ICTs for e-Environment Report[122], these symposia will bring together key specialists in the field, from top decision-makers to engineers, designers, planners, government officials, regulators, standards experts and others to examine the potential for ICTs to assist in addressing climate change issues. The ICTs for e-Environment report aims to better understand importance and impact of ICTs as tools for dealing with environmental issues, including climate change and provides lists of over 140 ICT environmental applications.

The partnership between ITU and UNEP – the Global e-Sustainability Initiative[123] (GeSI) which works

---

[122]   http://www.itu.int/ITU-D/cyb/app/e-env.html
[123]   http://www.gesi.org

with the private sector on issues relating to the environment is exploring ways to reduce the increasing challenge of e-Waste, including programmes to reuse and recycle existing equipment. GeSI is working with the Mobile Phone Partnership Initiative, a UN public-private partnership of the Basel Convention with representatives of mobile phone manufacturers, telecom operators, phone recyclers, NGOs and representatives of the Basel Convention Secretariat. The MPPI aims to: 1) reduce the environmental impact of mobile phones, 2) influence consumer behaviour, 3). promote environmentally sound management of used and discarded mobile phones. GeSI has also developed E-TASC – a web based supply chain risk management tool.

In April 2007, ECLAC, with support from the EC, published a study on disaster management called Regional Perspectives on Digital Disaster Management in Latin America and the Caribbean. It includes an assessment of the role of ICTs and in particular new technologies such as WiFi. APDIP and the Asian & Pacific Training Centre for Information and Communication Technology for Development (APCICT) released e-Primer on ICT for Disaster Management. The e-primer also looks at the importance of geographical information system and remote sensing tools in creating simulation models for preparedness planning, and in mapping recovery efforts.

A project to develop a regional platform on personal computer electronic waste in Latin America and the Caribbean was established in 2007. Based at the Corporacion de Estudios Sociales y Educacion in Chile with support from IDRC, through applied research, capacity building and communications, the project[124] will promote the proper management and disposal of e-waste in the region. The project will also explore the social business opportunities presented by recycling.

The Caribbean Disaster Emergency Response Agency[125] in Barbados established a project in 2007 to enhance the effectiveness of ICT tools for disaster management in the Caribbean with support from IDRC. Activities will include the testing of ICT applications and research in three island states to assist in developing set of policy recommendations to enhance regional strategies to respond to natural hazards using ICTs.

C7 E-Agriculture

Agriculture supports the livelihoods of the majority of people in developing countries but has only recently been a focus for the use of ICTs. Initial activities have mainly aimed at improved information dissemination, such as access to journal articles, guides and manuals for extension workers, and networking among developing country agricultural research institutes, along with market information for farmers. More recently a relatively large number of agriculture information and trading systems have been established, examples of which include: 1) the Agricultural Research and Extension Network in Uganda (ARENET), a web portal created to strengthen the links between the National Agricultural Research System (NARS) and the National Agricultural Advisory Services (NAADS), 2) the Virtual Academy for the Semi-Arid Tropics (VASAT), 3) the Pinoy Farmers' Internet, in the Philippines, an internet-based extension support system, 4) Hat Bazaar.NET in Bangladesh which provides information on agricultural produce, wholesale market prices as well as information on inputs, 5) E-Krishi, a market driven agricultural initiative through IT enabled Agri Business Centres in Kerala State, India, 6) The Kenya Agricultural Commodity Exchange (KACE) which provides market information and market linkage system and services, 7) e-Choupal, an agribusiness supply chain system using village internet

---

124   http://www.rrrtic.net
125   http://www.cdera.org

kiosks in India, 8) DrumNet which is encouraging Kenyan farmers to grow crops for export by providing loans and marketing information using a mobile phones to provide interactive links between producers, exporters, extension workers, and rural banks and 9) Tradenet.biz in West Africa, which lets people trade a variety of agricultural products using mobile phones.

FAO launched the first phase of the e-Agriculture Community of Expertise in 2007, a global initiative to enhance sustainable agricultural development and food security by helping stakeholders to share experiences and best practices the use of ICTs in the agricultural sector. Since its launch in September 2007, the online Community has over 3,000 stakeholders from more than 100 countries, representing policy makers, planners, development practitioners, farmer organisations, researchers and ICT specialists involved in agriculture and rural development. Community members interact with each other and contribute a range of resources, coordinated by the e-Agriculture Working Group (EAWG)[126], while FAO manages the development, editorial content, and maintenance of the web-based platform. Resources are being mobilised to support the Community's activities from the stakeholders themselves and a variety of donors.

An 'e-Agriculture Week' was held in September 2007 in Rome which highlighted the role of information, communication and knowledge management in agriculture and rural development, and allowed more than 300 participants to interact in discussions related to technologies, policy and sharing of expertise. One of the main open events during this week was a conference on *Web2ForDev: Participatory Web for Development*, initiated by partner CTA and organised by FAO and a number of collaborating organisations.[127] This event explored how stakeholders in agriculture, rural development, and natural resource management can exploit opportunities provided by Web 2.0 methods, approaches and applications.

IICD and the ACP-EU Technical Centre for Rural and Agricultural Cooperation (CTA) announced a collaboration agreement in December 2007 in the area of ICTs for agricultural and rural development. Capacity building of stakeholders in ACP countries will take place through in-country training events as well as through the use of distance learning tools to be able to increase the number of people that can be trained.

The IFAD and IDRC funded Knowledge Access in Rural Inter-connected Areas Network (KARIANET) focuses on promoting knowledge sharing in agricultural development projects in North Africa and the Near East. It held its 3rd Annual Thematic Workshop on Technology Transfer, Marketing Constraints and Tested Solutions in Cairo in October 2007.

C7 E-science
During the Cluster of WSIS-related events in 2007, UNESCO facilitated the e-Science multi-stakeholders consultation meeting, with the participation of the ITU, the European Organization for Nuclear Research (CERN), the WSIS-SI (Scientific Information) Civil Society caucus, the Max Planck

---

[126]   Members include: Consultative Group on International Agricultural Research (CGIAR); Technical Centre for Agriculture and Rural Development (CTA); UN Department of Economic and Social Affairs (DESA); FAO; Gesellschaft fur Technische Zusammenarbeit (GTZ); Global Forum on Agricultural Research (GFAR); Inter-American Institute for Cooperation on Agriculture (IICA); International Association of Agricultural Information Specialists (IAALD); International Centre for Communication for Development (IICD); International Fund for Agricultural Development (IFAD); International Telecommunications Union (ITU); World Bank.
[127]   IICD, GTZ, CGIAR, Euforic, IAALD, APC, ACP secretariat, IFAD, UBC and UCAD

digital library and the Monash University. The meeting defined four sub-themes (academic network access, Open access, P2P knowledge sharing, preservation of scientific data, standardized metadata and ontologies).

In March 2007 the European Commission announced that GEANT[128], the world's largest high speed computer network, would receive a further €90mn in funding to ensure all of Europe's researchers have access to a high-capacity high-speed communications network and high performance Grid- enabled advanced test-beds. *GEANT* already links researchers from Reykjavik to Vladivostok, serving around 30 million users in over 3500 universities and research centres connected via 34 national research networks. GEANT also provides global communications support for the Large Hadron Collider (LHC) at CERN, the single largest scientific experiment ever undertaken. Going live later in 2008, it will depend on high speed links around the globe for seamless transmission of unprecedented amounts of data (15 million gigabytes/year) to 5,000 scientists working in 500 institutes worldwide.

In February 2008 the EC provided a further €12 million for the Asia-wide Trans-Eurasia Information Network (TEIN). TEIN currently enables 10 countries in Asia and Pacific to use high bandwidth connections to carry out research projects globally. With the new budget and an additional €6mn coming from Asian partners, TEIN will be able to operate until 2011 with improved capacity in a greater number of countries. Four thousand research and education institutions with about 30 million end-users in the Asian countries are benefiting from the TEIN network. In March 2008 the Black Sea Interconnection (BSI) project was launched in Ankara to build a regional research and education network among South Caucasus countries and link them to GEANT. The EC provided €1.4 million funding for the BSI project within 7th Framework Programme for R&D.

GEANT already provides connections to research and academic networks in North Africa and the Mediterranean through its EUMEDCONNECT project and in January 2008 connections were expanded to include a consortium national research and education networks in East and Southern Africa called the UbuntuNet Alliance[129]. The South African R&E network, TENET is a member of the Alliance and has set up fibre optic cable connection from Cape Town to the GEANT2 network via London. The connection between the UbuntuNet Alliance's network hub in London and the GEANT2 network enables researchers and scholars in SubSaharan African universities and research institutions to share information and data and to collaborate through a 1 Gbp/s link with their peers in Europe and the rest of the world.

In May 2007 the EC agreed to extend funding for network expansion of the ALICE project which connects the Latin American regional research network, RedCLARA[130], to GEANT. As part of the process CLARA is expanding its role by increasing staff and taking greater responsibility for the running and administration of the network. To meet increased demand new links and Points of Presence (PoPs) are planned, whilst new technologies such as dark fibre are being investigated to deliver faster, more flexible services to users.

The 19th Open Grid Forum – OGF19 took place in Chapel Hill, USA. The OGF is a community-initiated forum of thousands of individuals from industry and research who are leading the global

---

[128]   http://www.geant2.net
[129]   http://www.ubuntunet.net
[130]   http://www.redclara.net

standardisation effort for grid computing. OGF's primary objectives are to promote and support the development, deployment, and implementation of Grid technologies and applications via the creation and documentation of 'best practices' – technical specifications, user experiences, and implementation guidelines.

C8 Cultural diversity and identity, linguistic diversity and local content
In October 2007 in Paris, UNESCO and the US Library of Congress signed an agreement to build a World Digital Library, to digitise unique rare materials from libraries and other cultural institutions around the world and to make them available free of charge on the Internet. These materials include manuscripts, maps, books, musical scores, sound recordings, films, prints and photographs. The prototype functions in Arabic, Chinese, English, French, Russian, Spanish and Portuguese. At the Library of Congress, the Bibliotheca Alexandrina, the National Library of Brazil, the National Library and Archives of Egypt, the National Library of Russia, and the Russian State Library presented a prototype of the future World Digital Library.

GAID organised a Global Forum on Youth and ICT on the theme "Youth as Agents of Change" in Geneva, September 2007. More than 500 participants engaged in discussions with peer representatives, policy makers and technology leaders in exploring ways to empower the community and to participate more fully in society through the appropriate and responsible use of ICT. The Forum also provided a platform to showcase youth-led initiatives and foster adult-youth cooperation to encourage the inter-generational transfer of skills and resources. Some 30 partners including DESA, ITU, UNESCO, ILO, WHO, UNFPA, HABITAT, Intel, Microsoft and civil society organisations contributed to the organisation of the Forum.

To encourage communities using information for development to share their success stories UNESCO's Information for All Programme (IFAP) is inviting organisations to submit success stories to the IFAP website where others can learn from them and either replicate or adapt them to their own local situations.

UNDP organised a workshop on e-Inclusion and Media for Indigenous Peoples at the e-Bario Knowledge Fair, in December 2007 in Malaysia. The Workshop addressed the use of the media and ICTs in realising the human rights for development that have been denied to indigenous peoples and participants formulated the e-Bario Agenda on e-Inclusion for Indigenous Peoples as a supplement to the UN Declaration, as well as discussing the develop a global network of Indigenous Peoples' telecentres.

The Mohammed bin Rashid Al Maktoum Foundation and the UNDP launched a new partnership to promote creative knowledge generation and investment in education in October 2007 at the Knowledge Conference in Dubai. The partnership marks the first of a series of strategic initiatives aimed at identifying challenges, best practices and policy solutions for the effective generation and application of knowledge in the region.

At the 2nd IGF in Rio de Janeiro, UNESCO, with ICANN and ITU presented a workshop, "Towards International Standards for a Truly Multilingual Global Internet." Representatives of ITU, ICANN and UNESCO announced that they would work together on developing a set of universal standards aimed at facilitating the creation of multi-lingual knowledge repositories.

The European Commission made a broad series of recommendations to governments, libraries and archives on promoting on online accessibility of cultural material and digital preservation in member countries. The Commission required reports from each country on progress made in the 18 months following the recommendations in 2006. These progress reports for all European countries have now been made available[131] on the EC Information Society portal.

The Internet technical management agency ICANN is continuing work to develop the capability for internationalising the characters that can used in top level domain names so that they can accommodate the scripts of other languages such as Arabic and Hebrew. Ten test top-level domains were inserted into the root servers in October 2007 and the development of allocation processes are under way. Twelve scripts have been adapted, with Amharic, Thai and Hebrew planned.

Work has begun on a digital portal for the Network of Francophone National Digital Libraries which will be launched in June 2008. The portal will make available collections of French literature online for developing countries.

In September 2007, UNIDO, the Government of Uganda and Microsoft launched an initiative to promote the development of the local software industry in Uganda and to enhance the role that local software developers and ICT graduates can play in the economies of developing countries. The first centre established in Uganda will act as an incubator for innovations and solutions in ICT and is expected to lead to similar centres in other countries.

ESCWA has made efforts to promote Digital Arabic Content (DAC) in 2007 and an assessment of the status of DAC in the region was carried out which examined opportunities, priorities and strategies for its promotion. ESCWA has provided financial support for the incubation of selected projects by young entrepreneurs. It also continued to be involved in the development of an Arabic Domain Names System (ADNS), joining efforts with the Arab Working Group on Arabic Domain Names to assess pilot projects in the region for the development of an ADNS. As part of ESCWA's efforts to ensure global interoperability of the ADNS, the findings were presented at several international events organised by ITU, UNESCO and the Internet Governance Forum. ESCWA also supported a regional consortium of country code top level domains (ccTLD) operators in the Arab region.

The League of Arab States convened the 7th meeting of the Arab Working Group on Arabic Domain Names and the 2nd meeting of the Arab Working Group for the preparation of the Internet Governance Forum in Cairo in September 2007. Strengthening cooperation with ICANN, UNESCO and ITU was discussed and ESCWA is expected to continue to coordinate efforts pertaining to ADNS on the global and regional levels.

C9 Media
UNESCO established indicators of media development and carried out a series of activities relating to media education in 2007. This included developing a comprehensive model curricula for Journalism Education, which was validated at the World Congress on Journalism Education in June 2007;

131

http://ec.europa.eu/information_society/activities/digital_libraries/commission_recommendation/reports/index_en.htm

establishment of quality criteria for media training institutions that focused on African media training institutions; and the launching of the first comprehensive media education module, for teachers, students and parents in June 2007. At the UNESCO facilitation meeting for C9 two additional themes were identified, on "media education and information literacy" and "community media, particularly radio and multimedia centres".

UNESCO provided support to the fifth World Congress on Science Communication held in 2007 in Melbourne, Australia where science journalists from more than 60 countries deliberated the ways and means to popularise science journalism in developing countries.

The winners of the African Information Society Initiative (AISI) Media Awards were announced at the GK3 Gala Dinner in December 2007[132]. The award is an initiative of the ECA supported by the Swiss Agency for Development and Cooperation (SDC), the International Development Research Centre (IDRC) and the International Institute for Communication and Development (IICD) and is presented to African journalists to encourage more informed coverage of the information society and ICT for development issues in Africa.

In September 2007 the NGO Panos London, published 'At the heart of change', a report on the role of communication in sustainable development. The report set out challenges to governments to involve civil society in decision-making and to recognise the role the media can play in debating development issues and challenging government accountability. Panos London also published 'Better connected - Empowering people through communications technology' in February 2008. This briefing for journalists sets out the main issues around the topic of promoting an enabling environment for ICTs, and shows how journalists can use academic research in their reporting.

C10 Ethical Dimensions of the Information Society
UNESCO initiated a series of regional Info-Ethics Conferences, which took place in December 2006 for Latin America and the Caribbean, and in 2007 for the African Continent and for the European Region. The African conference was held in Pretoria in February 2007 with support from the Nepad e-Africa Commission, the South African Presidential National Commission on Information Society and Development, the International Center for Information Ethics, based in Germany and the University of Wisconsin. The participants made the Tshwane Declaration on the Information Ethics in Africa and recommended the establishment of an African Information Ethics Advisory Board as a platform to advise African governments on the policy implications of the ethical dimensions of ICT-use. Also an Africa Center for Information Ethics at the University of Pretoria was proposed and a reader on Africa Information Ethics that can be used as a textbook for students and scholars.

The Conference on "Ethics and human rights in the information society" was organized by the French Commission for UNESCO in cooperation with UNESCO and the Council of Europe in September 207 in Strasburg[133]. The objective of these conferences was to provide a platform for reflection and debate on the ethical, legal and societal aspects of the information society by bringing together participants representing a wide range of educational, scientific, cultural and social environments.

---

132   http://www.uneca.org/aisi/mediaaward.htm
133   http://portal.unesco.org/ci/en/ev.php-URL_ID=24772&URL_DO=DO_TOPIC&URL_SECTION=201.html

In March 2007 UNESCO published a survey on ethical implications of emerging technologies such as semantic web, biometrics, radio-frequency identification, location-based services, mesh and ubiquitous networking, grid computing and other new computing technologies. The report offers recommendations on ways to advance infoethics goals in anticipation of these oncoming technologies.

The European Commission has continued to address ethical issues relating to the Information Society. In June 2007 the Commission Action Plan on Ageing well in the Information Society was launched, accompanied by a EU1bn increase in research funding for ICTs targeted at improving the life of older people. The Commission notes that the majority of older people in Europe do not yet enjoy the benefits of the digital age since only 10% use the internet, and severe vision, hearing or dexterity problems, frustrate many older peoples' efforts (21% of the over 50s) to engage in the information society. The EC has also engaged in a more general dialogue on ethical issues related to ICTs, holding a workshop on "Ethical Aspects of Inclusion in the Information Society" in October 2007 in Brussels. The event aimed to identify all the ethical issues relating to ICTs that are likely to emerge over the next 5 years. The EC already requires applications for EU-funded ICT research activities to explicitly address ethical issues.

The worldwide phenomenon of media piracy will be examined in a global project[134] launched in 2007 by IDRC and the Ford Foundation. A set of country case studies will be developed by project partners Fundacão Getúlio Vargas in Brazil, the global Association for Progressive Communications (APC) and the Centre for the Study of Developing Societies (CSDS) in India.

To encourage use of new online technologies, the European Commission has announced it will publish a Guide to EU Users' Digital Rights and Obligations in 2008.

The OpenNet Initiative - Asia (ONI-Asia) has been seeking to understand the technical and social aspects of digital censorship and surveillance across different countries in South and South East Asia. Additional support from IDRC in 2007 will allow ONI-Asia to network a group of research teams exploring the social, cultural, political and technical aspects of digital censorship and surveillance, breaking new ground in the areas of mobile telephone censorship and surveillance.

C11 International and Regional Co-operation
As of mid May 2007, approximately 40 countries submitted a progress report on WSIS activities to the portal available at the ITU web site which provides through an interactive map, access to the national reports on WSIS implementation prepared in collaboration with members States[135]. In 2007 the ITU also circulated the new request for updating information and submitting new project descriptions to the WSIS Stocktaking database[136]. More than three hundred new projects focusing on the information and communication infrastructure have since been registered and at the end of April 2007, there were more than 3'300 projects registered. In addition, a new approach for devolved Stocktaking responsibility has been introduced.

As a follow up to the WSIS Summits and parallel to the 2007 Annual Session of the UN Commission on Science and Technology for Development, the five UN Regional Commissions organized an event; "The Information Society – From Declaration to Implementation" in Geneva, in May 2007. Discussions highlighted the need to ensure strong and continuous regional ICT agendas in developing

---

134   http://mediaresearchhub.ssrc.org/toward-detente-in-media-piracy
135   http://www.itu.int/wisd/2007/wsis-implementation/
136   http://www.itu.int/wsis/stocktaking/plugin/search.asp

regions, such as the African Information Society Initiative (AISI); ESCAP Asia-Pacific Knowledge Economy Initiative; ESCWA Regional Plan of Action for building the Information Society or the Latin American and Caribbean Action Plan eLAC2007. Participants from Arab countries stressed that native language on the Web should be promoted to help increase the usage of the Internet.

The UN Group on the Information Society (UNGIS), currently chaired by UNESCO, held its second meeting in July 2007, with representatives from FAO, ILO, ITU, OECD, UNCTAD, UNESCO, UN-HABITAT, UNHCR, UNIDO, UNITAR, UNRWA, UNWTO, UPU, WIPO and WMO. UNGIS was set up by the UN Chief Executive Board (CEB) to facilitate efforts of WSIS implementation among UN Agencies and Programs. Participants recognised the importance for coherence in WSIS implementation and follow-up, as well as the role of UNGIS in this regard. Participants reported on the Cluster of WSIS-related events in Geneva in May 2007 and reviewed progress in implementing the UNGIS work plan. The meeting decided to focus its work for the coming twelve months on community access with a view to outlining a common UN approach. Participants decided to hold the next annual meeting of UNGIS during the cluster of WSIS-related events in 2008 in Geneva.

GAID launched regional networks for Asia and the Pacific, Europe, Africa, and countries in transition, as well as stakeholder networks composed of representatives from civil society, youth and persons with disabilities. A GAID Regional Network for Latin America and the Caribbean is to be launched in 2008.

The 10th UN Inter-Agency Round Table on Communication for Development, was hosted by UNESCO in Addis Ababa in February 2007. The Round Table aims at facilitating co-operation in developing a UN system-wide approach to Communication for Development in the context of achieving the Millennium Development Goals. Held on a biennial basis since 1988, the theme chosen for the Round Table was 'Developing a UN system-wide common approach to communication for development in view of achieving the Millennium Development Goals'.

During 2007, an Information Society Portal[137] was set up by ESCWA as a regional tool for follow-up on the implementation of the Regional Plan of Action (RPoA). The portal, available in English and Arabic, included a database with country specific information by themes. It was also designed to host real time online working groups, facilitate the establishment of communities of practice and promote partnerships.

To facilitate implementation, the regional ICT strategy, eLAC2010, assigned specific goals to relevant stakeholders who are already active players in the region. Over 88 entities have been identified as responsible for the implementation of one or more goals in the Action Plan. Delegates at the Ministerial Conference asked for the continued technical support of ECLAC in monitoring implementation.

Summit of the Americas Virtual Platform[138] was established in 2007 to develop an on-line virtual platform that will complement and enhance the face-to-face consensus-building activities of the Summits of the Americas process. The virtual platform will utilize ICTs to address the significant challenges of reaching multilateral consensus among multiple stakeholders on a broad spectrum of policy priorities in a relatively short time period and with limited resources. This project is implemented

---

[137]   http://isper.escwa.org.lb/isper/
[138]   http://www.summit-americas.org

and supported by the Summits of the Americas Secretariat of the OAS, with additional financial support from the Governments of Canada, Spain and Germany.

Responding to the growing demand for information on multi-stakeholder processes in ICT policy, the Association for Progressive Communications (APC), published the book "Frequently Asked Questions about Multi-Stakeholder Partnerships in ICTs for Development – A Guide for National ICT Policy Animators" in October 2007.

V. Implementation of the Themes of the Tunis Agenda[139]

Financing Mechanisms

The "1% digital solidarity principle" proposed by the Digital Solidarity Fund (DSF) continued to garner political support in 2007, including from the Pilot Group on Solidarity Levies to Fund Development[140], which met in Seoul in September 2007. A "World Conference on Digital Solidarity and its Financing", has been proposed. Expected to be held at the level of heads of State, the Conference will provide an opportunity for the international community to consider the adoption of an international convention on the "1% digital solidarity principle". It is expected that the outcome of the Conference will provide inputs to the Follow-up International Conference on Financing for Development to Review the Implementation of the Monterrey Consensus, to be held in Doha in November/December 2008.

The DSF has set two priorities for action geared towards health and education. In health, the DSF encourages local authorities in the advanced countries to become involved in specific digital solidarity initiatives through the "1,000 telemedicine units for Africa" programme. Cities and local authorities in the North are being invited to support fixed or mobile telemedicine units, contributing the expertise of their doctors and hospitals to remote diagnosis networks. In education, DSF promotes initiatives to equip schools with computers and interactive white-boards, and also make digital education resources available to teachers in the poorest countries.

At the Second anniversary of the second phase of WSIS, the Tunisian Government organised the second ICT 4 All Forum – Tunis+2 in Hammamet, in November 2007. Supported by UNCTAD, GAID, the African Development Bank, and Tunisian Union for Industry, Commerce and Handicraft, the forum focused on the deployment of ICTs through public-private-partnerships (PPPs). The forum was attended by more than 600 participants, representing more than 30 countries and included representatives from governments, the business community, potential investors as well as international experts. The ICT4All Forum provided an opportunity for participants to share experiences with best practices in PPPs and to present models, approaches and national strategies for establishing PPPs.

---

[139]   The Tunis Agenda for the Information Society is available on the WSIS homepage at
          http://www.itu.int/wsis/index.html
[140]   Comprising 54 states.

Internet Governance

The *Tunis Agenda on the Information Society* requested the Secretary-General to proceed with regard to the process towards enhanced cooperation on public policy issues pertaining to the Internet[141]. The Secretary-General started this process by giving a mandate to his Special Adviser for Internet Governance, Mr. Nitin Desai, to consult with representatives of all stakeholder groups – government, the private sector, civil society as well as the technical and academic communities – in order to find common ground on the issue. In September 2006, Mr. Desai submitted a report with the results of these consultations. The report noted that the consultations elicited a range of different views on the implications of what was agreed at Tunis on this topic and there was little common ground between the main actors. In August 2007, being entrusted by the Secretary-General, UNDESA continued the consultation process, focusing on the next steps to be taken. In light of the continuing differences of views on the interpretation of the *Tunis Agenda*, a starting point was made with the reporting requirement contained in paragraph 71 of the *Tunis Agenda which* states that "(…) relevant organisations shall be requested to provide annual performance reports". The Under-Secretary-General, on behalf of the Secretary-General, wrote a letter to all organisations responsible for essential tasks associated with the Internet"[142] to report on the steps they have taken towards enhanced cooperation. Once the information is received from those organisations, the Secretary-General will report it to the General Assembly and the Economic and Social Council, and based on the received information, will make recommendations on how the process towards enhanced cooperation should be pursued.

The Internet Governance Forum (see the Tunis Agenda, paragraphs 71 to 79) held its second meeting[143] in November 2007 in Rio de Janeiro. The meeting focused on seven themes: 1) Critical Internet resources; 2) Openness; 3) Security, 4) Diversity, 5) Access; 6) Taking stock and the way forward; and 7) Emerging issues. The Session on critical Internet resources covered a wide range of issues related to the infrastructure of the Internet. Participants discussed the role of Internet Corporation for Assigned Names and Numbers (ICANN) and governments, as well as Internet oversight. Participants underlined the importance of cyber-security, especially with respect to child protection and child pornography on the Internet. They called for harmonisation of legislation between countries and also for bringing into force new legal instruments that apply to the online environment. Participants also called for innovative methods to get the next billion people online, which was linked to the issue of diversity, where participants underscored the importance of a multilingual Net with additional IDNs (Internationalised Domain Names) to reflect the expanding trends of Internet users in non-English speaking parts of the world. The link between Internet governance and sustainable development emerged as a new issue. Participants addressed the environmental impact of ICTs, as well as the positive contribution the Internet could make in the fight against climate change. The International Institute for Sustainable Development (IISD) launched a book on the subject at the meeting which observes that the Internet governance community and the sustainable development community can learn from each others' experiences, especially in the decision making process.

The IGF meeting was attended by 1,363 participants from 109 countries, with a notable increase in the number of participants from developing countries. Remote participants had the opportunity to participate, via online chat, email, discussion boards and blogs. The stocktaking process for the Rio

---

[141]   World Summit on Information Society Tunis Agenda paragraphs 69-71.
[142]   Paragraph 70 of the Tunis Agenda.
[143]   See http://www.intgovforum.org/Rio_Meeting/Chairman%20Summary.FINAL.16.11.2007.pdf for summary report.

meeting started with an online form available on the IGF website and continued with meeting of the IGF in Geneva in February 2008. The preparatory process will continue with another round of open consultations in Geneva in May 2008 to discuss the agenda and the programme for the third meeting of the IGF, scheduled to take place in Hyderabad, India in December 2008. IGF 2009 will be hosted by Egypt.

ICANN held a series of public meetings in 2007/8 in Dubai, New Delhi and Lisbon aimed at policy makers, managers of country code Top-Level Domain (ccTLD), and Internet businesses to discuss a variety of topics, in particular ICANN's multi-stakeholder model for addressing issues under its mandate; Internationalised Domain Names (IDNs); challenges and opportunities in Registry/Registrar businesses and the current developments in the generic Top-Level Domains (gTLDs) space.

ITU published a study on ccTLDs titled "Policy, Business, Technical, and Operational Considerations for the Operation of a ccTLD" in January 2008. The study is derived from ITU technical assistance to Somalia, but can be applied to other countries.

The Diplo Foundation continued its Internet Governance programme in 2007. In the three years since the programme began it trained 264 young professionals from 90 countries and built a community of experts of nearly 300 people around the world. The programme aims to raise awareness about IG related issues through a toolkit of text and visual resources, to train policy makers through seminars, workshops and training programmes, to promote research on issues of special concern to developing countries and to build a community of experts in developing countries who can contribute to the regional and global debate on Internet Governance.

Measuring ICT for development

Since the endorsement of the Partnership on Measuring ICT for Development's core list of ICT indicators by the UN Statistical Commission in 2007, several developing countries have integrated the indicators into existing household and business surveys. In July 2007, Partnership members signed a MoU in which the ten member organisations agreed to expand their joint efforts in the area of ICT measurement, including by providing technical assistance to national statistical offices so that they are better able to collect and process official data and indicators on their information societies. During 2007, the Partnership mainly focused on assisting developing countries in the production of ICT statistics, through an assessment of capacity building needs in countries, the organisation of training sessions, seminars and workshops, and advisory missions. These included regional workshops, organised by the regional commissions in collaboration with international organisations and UN entities, such as ITU, UNCTAD, DESA and UNESCO, and other regional statistical institutions. A new Partnership publication, *The Global Information Society: a Statistical View* was published in May 2008 which takes stock of progress made in meeting WSIS goals.

In 2007, UNCTAD launched the first methodological Manual for the Production of Statistics on the Information Economy. The Manual supports the production of official statistics on the ICT sector, ICT trade and the use of ICT by businesses, in particular in developing and transition economies.

In response to the request by ITU membership for the development of a single ITU index to measure national progress towards building information societies, ITU commissioned an independent study of index methodologies and indicators as a background document for the 6th World

Telecommunication/ICT Indicators Meeting, held in Geneva in December 2007. The meeting made a number of recommendations regarding the single ITU index, including recommendations on the methodology and choice of indicators to be included. The single ITU index is expected to be finalised and published during 2008. The meeting also considered new indicators in the area of mobile/wireless broadband measurement and computer virus infection levels. In addition, Community Access Indicators were examined and the meeting suggested a number of measures, including tracking the percentage of localities (villages, towns etc) with a public Internet access centre and those that are connected to the public telephone network.

The OECD Working Party on Indicators for the Information Society, published "Measuring the Impacts of ICT using Official Statistics" in January 2008. Among other conclusions, the report found that there is evidence that e-commerce makes markets more price competitive by opening up supply to more firms and reducing transaction costs. The report also found that IT productivity gains are greatest in firms with more qualified (degree level) employees.

The second OECD World Forum on "Statistics, Knowledge and Policy"[144] took place in June 2007 in Istanbul. The Istanbul Declaration has since been adopted by the representatives of the UN, the European Commission, the OECD, the Organisation of the Islamic Conference and the World Bank. The event brought together 1,200 participants from developing and developed nations and this year's the Forum focused on the role of information production and dissemination for knowledge generation, and the importance of information in the 'statistics, knowledge and policy' chain. The declaration addressed four main action points: to carry out statistical research on the measurement of societal progress in all its dimensions; to design, develop and promote the use of innovative ICT tools to facilitate the transformation of statistics into knowledge – especially making use of wiki 2.0 technology; to establish a global network to help measure progress in every country; to develop a global infrastructure to facilitate the assessment of societal progress at national and global levels.

The first international exhibition on innovative tools to transform information into knowledge was organised during the OECD World Forum and gave the opportunity for organisations active in indicators and measures of progress to showcase their latest work, demonstrate innovative tools to disseminate data and promote new indicators.

An OECD workshop on the Economic and Social Impacts of Broadband Communications took place in May 2007 to review studies of the impacts of broadband roll-out and use on a) economic performance at aggregate level and in the business sector, and b) the geographical distribution of economic activity and employment, on content producers and users, and on households.

At the Connect Africa Summit in Kigali in October 2007 a new joint effort between ITU and Microsoft was announced which aimed help measure efforts to achieve the WSIS goals. Called ITU Global View, the virtual earth-based online platform integrates a broad range of new and existing data sources on global ICT for development accomplishments, allowing users to check status, identify gaps and avoid overlap in collaborative efforts to achieve the WSIS goals.

UNDP organised a Workshop on Measuring and Assessing Democratic Governance in Bangkok, in November 2007 in co-operation with the UNDP Regional Centre in Bangkok and the UNDP Oslo

---

144   http://www.oecd.org/document/51/0,3343,en_21571361_31938349_37115187_1_1_1_1,00.html

Governance Centre. The workshop focused on existing methods for measuring democratic governance and examined the processes of governance assessments.

The Fifth Annual General Meeting of ARICEA took place in Cairo in February 2007 which concluded that the COMESA Secretariat and Member States should work on: (1) building ICT awareness; (2) elaborating and monitoring implementation of a National ICT Declaration and Action Plan; (3) verifying that national plans are in line with the WSIS action plan; and (4) developing and implementing ICT impact indicators in economic development. These activities would involve developing regional benchmarks and definitions, including matters relating to broadcasting policy. Establish a one-stop shop for national ICT indicators and indices.

As part of activities of the Partnership, ESCAP, ITU and APT co-organised the Capacity Building Workshop on Information Society Statistics: Infrastructure, Household and other Indicators in November 2007.

ICT uptake measurement work has continued at ECLAC's Observatory for the Information Society in Latin America and the Caribbean (OSILAC), including a report entitled Monitoring eLAC2007, released in August 2007. OSILAC also organised the 4th workshop on Information Society Measurement in Latin America and the Carribean in February 2008 in San Salvador. As part of its ongoing monitoring efforts OSILAC is planning to expand its online information system; monitor national policies and projects related to elac2010 regional action plan; and increase the number of countries and indicators involved.

ANNEX 1 - GLOSSARY

3G	Third-Generation (mobile phone technology)
ADB	Asian Development Bank
ADOC	APEC Digital Opportunity Centre
AfDB	African Development Bank
AISI	African Information Society Initiative
APC	Association for Progressive Communications
APEC	Asia-Pacific Economic Cooperation
APKN	African Parliamentary Knowledge Network
ARAPKE	African Regional Action Plan on the Knowledge Economy
ATU	African Telecommunication Union
BACI	Banque Analytique de Commerce International (International Trade Analytical Database)
BIC	Business Information Centre
BPL	Broadband over electric Power Lines
BPO	Business Process Outsourcing
CAD	Canadian Dollar
CAFRAD	African Training and Research Centre in Administration for Development
CAGR	Compound Annual Growth Rate
CDPF	Country Development Programming Framework
CEEAC	Communauté Économique des États de l'Afrique Central
CEMAC	Communauté Économique et Monétaire de l'Afrique Centrale
CEPII	Centre d'Etudes Prospectives et d'Informations Internationales (Institute for Research on the International Economy)
CePRC	Canadian e-Policy Resource Centre
CIDA	Canadian International Development Agency
CIS	Commonwealth of Independent States
CMC	Community Media Centre
COMARCI	Commonwealth African Rural Connectivity Initiative
COMESA	Common Market for Eastern and Southern Africa
CPRGS	Comprehensive Poverty Reduction and Growth Strategy
CRASA	Communications Regulators Association of Southern Africa
CSTD	UN Commission on Science and Technology for Development
CTA	ACP-EU Technical Centre for Rural and Agricultural Cooperation
CTO	Commonwealth Telecommunications Organisation
DAC	Development Assistance Committee or Digital Arab Content
DAX	Deutsche Aktien Exchange
DESA	UN Department of Economic and Social Affairs
DFID	UK Department for International Development
DOT-Force	Digital Opportunity Task Force
DSL	Digital Subscriber Line
EAC	East African Community
EAP	East Asia and the Pacific
EC	European Community

EC	APEC Economic Committee
ECA	UN Economic Commission for Africa
ECCAS	Economic Community of Central African States (CEEAC)
ECE	UN Economic Commission for Europe
ECLAC	UN Commission for Latin America and the Caribbean
ECOWAS	Economic Community Of West African States
EMBIG	Emerging Market Bond Index-G
EPO	European Patent Office
ESCAP	UN Economic and Social Commission for Asia and the Pacific
ESCWA	UN Economic and Social Commission for Western Asia
EU	European Union
FCC	Federal Communications Commission (USA)
FDI	Foreign Direct Investment
FLOSS	Free/Libre/Open Source Software
FTTH	Fibre to the Home
GAID	Global Alliance for ICT and Development
Gbps	Gigabits per second (one billion bits per second)
GDP	Gross Domestic Product
GIF	Government Interoperability Frameworks
GIS	Geographical Information Systems
GKP	Global Knowledge Partnership
GK3	Third Global Knowledge Conference
GNI	Gross National Income
GMS	Greater Mekong Subregion
GPS	Global Positioning System
ICANN	Internet Corporation for Assigned Names and Numbers
ICD	Information and Communication for Development
ICT	Information and Communication Technologies
ICT4D	Information and Communication Technology for Development
IDRC	Canadian International Development Research Centre
IFC	International Finance Corporation
IFI	International Finance Institution
IGF	Internet Governance Forum
IICD	Netherlands International Institute for Communication and Development
IMF	International Monetary Fund
*Info*Dev	World Bank Information for Development Program
IP	Internet Protocol
IPA	Investment Promotion Agency
IPTV	Internet Protocol Television
IPU	Inter-Parliamentary Union
IRU	Indefeasible Rights of Use
ISDN	Integrated Services Digital Network
ISO	International Organization for Standardization
ISP	Internet Service Providers
IT	Information Technology

ITU	International Telecommunication Union
IXP	Internet Exchange Points (exchanges traffic between different local networks)
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
LAC	Latin America and the Caribbean
LDCs	Least developed countries
LOGIN	Local Governance and ICTs Research Network
Mbps	Megabits Per Second (unit for measurement of electronic data traffic)
MDG	Millennium Development Goal
MENA	Middle East and North Africa
MP	Member of Parliament
MSPs	Multi-stakeholder partnerships
NBIN	NEPAD Broadband ICT Network
NEPAD	New Partnership for Africa's Development
NGN	Next Generation Networks
NGO(s)	Non-governmental Organisation(s)
NICI	National Information and Communication Infrastructure
NORAD	Norwegian Agency for Development Cooperation
OAS	Organization of American States
OCCAM	Observatory for Cultural and Audiovisual Communication
ODA	Official Development Assistance
ODI	Overseas Development Institute
OECD	Organisation for Economic Co-operation and Development
OECD-DAC	OECD Development Assistance Committee
OFC	Optical Fibre Cable
OPEC	Organization of the Petroleum Exporting Countries
OSD	Open Science Directory
OSILAC	Observatory for the Information Society in Latin America and the Caribbean
OSISA	Open Society for Southern Africa
P2P	Peer-to-peer
PC	Personal Computer
PICTA	Partnership for Information and Communication Technologies in Africa
POVNET	Network on Poverty Reduction
PPG	Pro-poor growth
PPP	Public-Private Partnership
PPP	Purchasing Power Parity
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PSTN	Public Switched Telephone Network
PTO	Public Telecommunications Operator
RASCOM	Regional African Satellite Communication Organisation
R&D	Research and Development
REC	Regional Economic Community
SADC	Southern Africa Development Community

SAR	South Asia region
SCADA	Supervisory Control and Data Acquisition
SDC	Swiss Agency for Development and Co-operation
SIDA	Swedish International Development Agency
SLF	Sustainable Livelihoods Framework
SME	Small and medium-sized enterprise
SMS	Short Message System
SSA	Sub-Saharan Africa
Tbps	Terabit per second (one thousand gigabits per second)
TICAD	Tokyo International Conference on African Development
UEMOA	Economic and Monetary Community of Central Africa
UMA	Union of Maghreb States
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	UN Economic Commission for Africa
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNU	United Nations University
UPU	Universal Postal Union
USAID	United States Agency for International Development
USD	United States Dollar
VoIP	Voice over Internet Protocol
WATRA	West African Telecommunications Regulators Association
WBG	World Bank Group
WiFi	Wireless Fidelity
WiMax	World Interoperability for Microwave Access
WIPO	World Intellectual Property Organisation
WLL	Wireless Local Loop
WSIS	World Summit of the Information Society
WMO	World Meteorological Organisation
WTO	World Trade Organization
WTSA	World Telecommunication Standardization Assembly

Measures

Kilobyte	1'000 Byte
Megabyte	1'000'000 Byte
Gigabyte	1'000'000'000 Byte
Terabyte	1'000'000'000'000 Byte
Petabyte	1'000'000'000'000'000 Byte
Exabyte	1'000'000'000'000'000'000 Byte

LIST OF SUBMISSIONS

The following UN contributions and presentations available on the UNCTAD Web site were taken into consideration in the production of this report. The documents are available for download at: http://www.unctad.org/Templates/Page.asp?intItemID=4447&lang=1

#	Documents	
1	Gender Dimensions of Development-oriented policies for a socio-economic inclusive information society, including access, infrastructure and enabling environment by the Gender Advisory Board to the Commission on Science and Technology for Development, 15/04/08 , 4 pages, 35KB	
2	Gender Dimensions of Science, technology and engineering for innovation and capacity building in engineering and research by the Gender Advisory Board to the Commission on Science and Technology for Development, 15/04/08 , 10 pages, 71KB	
3	Highlights of UNESCO's involvement in the WSIS follow-up process (2007) by United Nations Educational, Scientific and Cultural Organization, 10/04/08 , 13 pages, 54KB	
4	Contribution to the UN Secretary-General's Report on the Implementation of the World Summit on the Information Society by the Secretariat of the Internet Governance Forum, 10/04/08 , 7 pages, 117KB	
5	UNECE Report on WSIS implementation by Economic Commission for Europe, 24/02/08 , 7 pages, 64KB	
6	Progress made in the implementation of the outcomes of the WSIS by UNCTAD Secretariat, 24/01/08 , 12 pages, 77KB	
7	Activities in relation to ICT and WSIS action line implementation in UN-Habitat by UN - HABITAT, 24/01/08 , 6 pages, 43KB	
8	Contribution to the UN Secretary-General's Report on the implementation of the World Summit on the Information Society, by the Global Digital Solidarity Fund (DSF), 24/01/08 , 6 pages, 49KB	
9	The Status of Implementation of WSIS Outcomes in Latin America and the Caribbean by Economic Commission for Latin America and the Caribbean, 24/01/08 , 8 pages, 58KB	
10	DESA's contribution to the UN Secretary General's Report on the Implementation of the World Summit on the Information Society (WSIS) by the United Nations Department of Economic and Social Affairs (UNDESA), 24/01/08 , 10 pages, 77KB	
11	ESCWA's contribution to the Secretary-General progress report on WSIS outcomes to CSTD's 11th Session by Economic and Social Commission for Western Asia (ESCWA), 24/01/08 , 8 pages, 84KB	
12	Contribution to the UN Secretary-General's Report on the Implementation of the World Summit on the Information Society by International Telecommunication Union, 24/01/08 , 11 pages, 149KB	
13	WMO contribution to the 2007 report on the implementation of the outcomes of the WSIS by World Meteorological Organization, 24/01/08 , 4 pages, 38KB	
14	WHO Contribution to Secretary-General`s Report to CSTD by World Health Organization, 24/01/08 , 3 pages, 31KB	
15	Flow of Information for the follow-up to the World Summit on the Information Society by Universal Postal Union, 24/01/08 , 7 pages, 54KB	
16	Input to the Secretary-General's report to the Commission on Science and Technology for Development on the system-wide follow-up to WSIS by Economic and Social Commission for Asia and the Pacific, 24/01/08 , 6 pages, 39KB	
17	Report on the Implementation of Outcomes of the World Summit on the Information Society by Economic Commission for Africa, 24/01/08 , 7 pages, 93KB	
18	E-AGRICULTURE COMMUNITY OF EXPERTISE by Food and Agriculture Organization of the United Nations, 24/01/08 , 9 pages, 82KB	