



chapter six

Implementing WSIS Outcomes

6.1 Halfway towards the WSIS goals

The year 2007 marks the second full year of implementation, following the successful conclusion of the Tunis Phase of the World Summit on the Information Society (WSIS), which took place in Tunis on 16-18 November 2005. More significantly, it represents a midway point between the formal adoption by the UN General Assembly of the WSIS as a Summit in two phases under the patronage of the UN Secretary-General in December 2001, and the anticipated review of the WSIS outcomes due to take place in 2015.¹ This Chapter evaluates what has been achieved thus far in the WSIS process and what remains to be done.

6.1.1 A comprehensive implementation plan

The WSIS is unique among UN Summits in that it was conceived as a Summit in two phases. Governments and participants agreed on a set of principles for the Summit outcomes in the first Phase (see the *Geneva Plan of Action*) and later developed a strategy for implementation (in the *Tunis Agenda for the Information Society*). Difficult issues, on which agreement could not be reached during the first Phase—principally Internet Governance and the financing of ICT for development—were addressed in the second Phase, *inter alia*, through the creation of the Internet Governance Forum² and voluntary Digital Solidarity Fund.³

Due to the far-reaching nature of the Information Society, a comprehensive implementation plan is beyond the remit of any single UN agency. The resulting implementation plan, the *Tunis Agenda for the Information Society*, operates on three levels:

» **National implementation** (Para 100 of the *Tunis Agenda*) is to be established through national implementation mechanisms, with individual governments taking the lead.⁴ As part of its work in facilitating WSIS implementation, ITU has carried out a survey of national implementation and this information will be made available to all stakeholders.⁵ A good example, in this respect, would be the initiative taken by the Government of Egypt, where the Ministry of Communications and Information Technology (MCIT) published in December 2006 a “Golden Book”, summarizing its WSIS-related activities (some 127 in total).⁶

» **Regional implementation** (Para 101) involves the UN Regional Commissions and inter-governmental organizations, based on a multi-stakeholder approach. For example, the Economic Commission for Latin America and the Caribbean (ECLAC) has developed eLAC2007, a regional plan of action for the Information Society (Figure 6.1). Furthermore, in conjunction with Institute of Connectivity of the Americas (ICA) and the Canadian International Development Research Centre (IDRC), ECLAC has established an Observatory for the Information Society in Latin America and the Caribbean (OSILAC) to centralize work on Information Society indicators.⁷

» **International implementation** (Para 102) has three main components:

» **Inter-agency coordination** within the UN system (Para 103-4), which is coordinated by the newly-established UN Group on the Information Society (UNGIS). UNGIS was formally established in April 2006 by the UN Chief Executive’s Board and held its first meeting in ITU on 14 July 2006. UNGIS will be chaired on a rotating basis by ITU, UNESCO and UNDP.⁸

» **The multi-stakeholder implementation process** (Para 108-110), which is described in more detail in Section 6.1.2 below.

» **Follow-up** (Para 105), which is coordinated by the UN Economic and Social Council (ECOSOC) through the Commission on Science and Technology for Development (CSTD). The Commission, which was established in 1992 and enlarged in 2006, comprises 43 Member States representative of all UN regions. The tenth session of the CSTD will be held in Geneva, 21-25 May 2007, under the theme “Promoting the building of a people-centred, inclusive and development-oriented Information Society”. The CSTD is tasked with assisting ECOSOC in overseeing UN system-wide follow-up to the WSIS.⁹

6.1.2 WSIS stocktaking

The *Tunis Agenda* requested that the ITU continue to maintain and update the stocktaking database of WSIS-related activities. The stocktaking portal (www.itu.int/wsis/stocktaking) is structured around the eleven WSIS action lines and contains over 3’300 WSIS-related activities submitted by

Figure 6.1: Regional Plan for the Information Society in Latin America and the Caribbean (eLAC2007)



Note: The plan was approved at the Regional Latin American & Caribbean Preparatory Ministerial Conference for the WSIS, 10 June 2005, in Rio de Janeiro, Brazil.

Source: UN Economic Commission for Latin America and the Caribbean at: www.eclac.cl/socinfo/elac/default.asp?idioma=IN

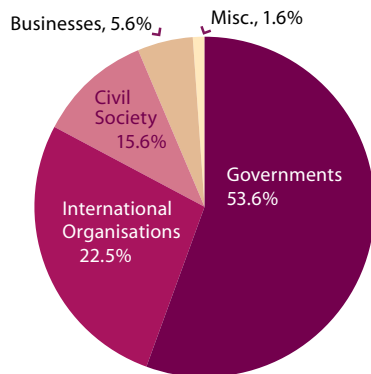
stakeholders. In early 2007, Member States and WSIS stakeholders were invited to submit fresh activities and update existing activities.¹⁰ A selection of activities is described later in this chapter.

The stocktaking database has been improved by regular updates and password-protected access, with the addition of extra search terms at the request of stakeholders. It has also been integrated into the ITU's "ICT Eye" portal for market, regulatory and statistical information, so data on WSIS-related activities can be assessed in the context of other country-specific information.¹¹

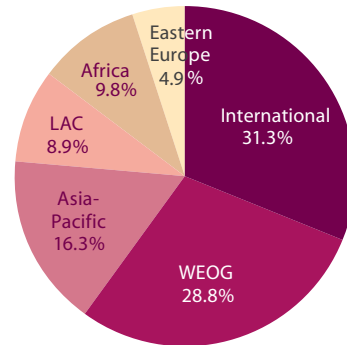
A breakdown of entries in the WSIS stocktaking database is presented in Figure 6.2. As expected, governments have provided the majority of activities in the database, followed by international organizations. Activities of an international nature and activities in the Western Europe and Other Group (WEOG) dominate the database. The WSIS stocktaking is a basic resource for exploring the ICT success stories featured in this chapter and throughout this report.¹²

Figure 6.2: WSIS stocktaking activities

Breakdown of entries by submitting entity



Breakdown of entries by UN region



Note: WEOG = Western Europe and other group (also includes North America, Australia and New Zealand).
LAC = Latin America and the Caribbean.

Source: WSIS Stocktaking Database, www.itu.int/wsis/stocktaking.

6.1.3 Multi-stakeholder implementation

One of the main characteristics of the WSIS process is the commitment to multi-stakeholder participation. Although this concept is by no means new, it has permeated the WSIS process to a greater extent than in any previous UN Summit and is the cornerstone of WSIS implementation.

Multi-stakeholder implementation unites the efforts of governments, private sector entities and civil society, as well as international organizations. It is described in more detail in Paras 108-110 of the *Tunis Agenda*, as well as in its Annex, which proposes moderators/facilitators for the eleven WSIS Action Lines. ITU, UNESCO and UNDP were invited to play the leading facilitating roles in the WSIS implementation process. In order to put the multi-stakeholder process into motion, the three agencies convened a meeting of moderators/facilitators on 24 February 2006, in Geneva.¹³ It was agreed that, each year, a cluster of Action Line facilitation meetings would be held on 17 May, which has been designated by the UN (in response to the request from WSIS) as World Information Society Day, in addition to World Telecommunication Day (Box 6.1). A summary of the meetings to be held in the 2007 WSIS cluster can be found at: www.itu.int/wsis/implementation.

The next three sections present an overview of WSIS implementation, covering the three clusters of the Digital Opportunity Index (DOI), namely: promoting digital opportunity, upgrading infrastructure and increasing utilization.

6.2 Digital Opportunity

6.2.1 Accessibility

For developing countries, one of the most promising ways of increasing access to ICTs is through communal access, such as public access points or telecentres. For youth, they also offer exposure to and training in the ICT skills that are essential in a modern economy. Different approaches have been followed to strengthen the work of telecentres (Box 6.2). Telecentres are usually most effective when they are combined with existing social centres, such as town halls, meeting points, religious centres or youth clubs or other public facilities such as post offices or schools. Despite their promise, telecentres may have to overcome significant obstacles to gain acceptance, including local resistance, poverty, illiteracy and a lack of local content.

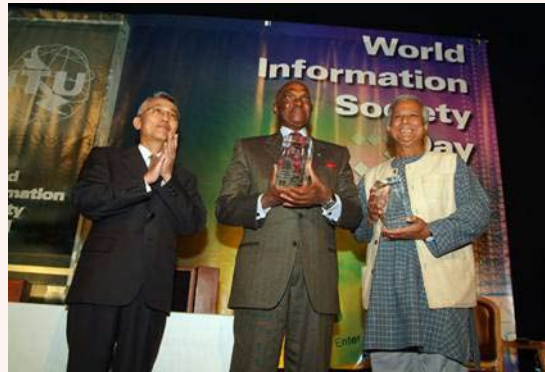
Initiatives to promote telecentres have been launched in different countries (see, for instance,

Box 6.1: World Information Society Day Awards

One outcome of WSIS was the launch by ITU of the World Information Society Day awards on 17 May 2006. The award recognizes individuals or institutions that have made a significant contribution to building the Information Society in either:

- Social accomplishment;
- Mobilization of public opinion; or
- Key technical innovation.

The inaugural awards were made to HE Abdoulaye Wade, President of Senegal and Prof. Mohammed Yunus, Managing Director of Grameen Bank Bangladesh, in recognition of their personal contributions to building the Information Society. Later in 2006, Prof. Yunus and Grameen Bank jointly received the Nobel Peace Prize, honouring their “efforts to create economic and social development from below”.



The inaugural ITU World Information Society Day award-winners, H.E. Abdoulaye Wade (centre) and Prof. Mohammed Yunus (right) are honored by the former ITU Secretary-General, Yoshio Utsumi (left).

Source: ITU (at www.itu.int/wisd) and the Nobel Foundation (at <http://nobelprize.org/>).

Image Source: ITU

the example of **Senegal** highlighted in Box 6.3). In Asia, in **China**, the ‘Poverty Alleviation through Science and Technology in China’ initiative was launched as early as 2001.¹⁴ By 2004, telecentres had been established in five regions and village staff was trained in Beijing in equipment and management. In **Myanmar**, Myanmar Info-Tech initiated a programme of Public Access Centres (PACs) in 2006 to be established throughout the States and Divisions of the Union of Myanmar for easy and affordable Internet access by students, firms and local organizations. **New Zealand** also has a ‘Connecting Communities’ strategy to promote partnerships between local government and the private sector in connecting up local communities.

In Latin America, the Program ACESSA São Paulo (PASP) has set up 123 Infocentros since 2000 in São Paulo, **Brazil**, with a total capacity of 1.75 million visits per year to address digital exclusion and give community Internet access to low-income groups. Communities can define their own priorities, including how the equipment donated by government is to be used. In **Colombia**, three telecentres have been set up to support indigenous rights, with funding from the Canadian International Development Research Centre (IDRC). These telecentres — combining an Internet café with a

library and meeting place — are housed at the Association of Indigenous Governing Councils of North Cauca and are helping to raise awareness of the rights of indigenous Indians and denounce human rights abuses.

In Africa, the **Appui au Desenclement Numerique (ADEN)**¹⁵ is aiming to democratize the use of ICTs by establishing 60 public Internet access points, to be managed by associations, local authorities or educational institutions. ADEN will also conduct train-the-trainer courses in network administration and management of public Internet access points. To date, ADEN has been active in Angola, Burkina Faso, Burundi, Cameroon, Central African Republic, Congo (D.R.), Guinea, Mozambique, Nigeria, Senegal and Tanzania. **Ghana**’s eCARE programme (e-commerce and renewable energy) will establish three telecentres in rural areas in Accra, Eastern and Volta regions, offering training, follow-up financial support, discounted airtime and equipment to recruited entrepreneurs.

A number of initiatives are broadening access to information even further, for example, by using radio to disseminate information obtained from the Internet more widely. In the developing world, radio sets are relatively cheap, and

Box 6.2: Supporting the work of telecentres

Telecentres offer access to ICTs at reduced cost, by pooling resources and expertise to make ICTs affordable to communities where personal ICT ownership is limited.

Initiatives to strengthen telecentres include:

- Government programmes and public statements of support, as happened, for example, for PubliNets in **Tunisia** (see Section 4.6.1) and **Egypt's** plan to establish 300 publicly accessible telecentres covering all 26 Governorates;
- studies on telecentres (e.g., Roman & Colle, 2002) and online support networks for sharing experiences;¹⁶
- technical solutions in software and connectivity; and
- initiatives to extend ICT skills into the broader community.

In Kerala, **India**, the 'Akshaya Project' was launched in November 2002 to bridge the digital divide and boost Kerala's standing as India's foremost knowledge society. Akshaya has three focus areas – to promote access to ICTs, to develop IT skills by all sections of society and to develop local language content on relevant topics. Akshaya is one of the most ambitious ICT programmes ever attempted in a developing country, aiming to build a network of 6'000 information centres, generate 50'000 job opportunities and attract investment of Rs.500 Crore (around US\$ 120m) over three years. It has been successfully implemented in Malappuram.

UNESCO has established a Community Multimedia Centre (CMC) initiative to promote community empowerment and contribute to bridging the digital divide. One feature of UNESCO's approach is the linkage established between the Internet, as a source of information, and local community radio for dissemination.

Telecentre.org is a universal access network launched during the Tunis Phase of the WSIS that unites telecentre managers in an online network. It supports the work of telecentre staff with training, marketing and technology. In **Uganda**, an NGO promoting the integration of ICTs into Uganda's development efforts, UgaBYTES, offers technical solutions for telecentres - in 2002, it introduced the Telecentre Manager software, allowing managers to track user activities by automatically-generated registration and user reports. The software was offered free, along with training.

Taking a different approach, Indonesia's "Digital Scout programme" seeks to broaden ICT skills through ICT-savvy youth visiting remote areas to educate locals about the uses and benefits of ICTs. The programme asks participants to consider which applications and training are most appropriate for given communities, rather than applying blanket solutions to unique problems. (This is similar in concept to **New Zealand's** "Technical Angel" project - see Box 6.6).

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

the service is popular and accessible, especially where illiteracy is high. Radio broadcasts of weather forecasts for fishermen in **India**, crop prices for farmers in Africa or calls for political rallies help inform people who would otherwise be unaware. In **Nepal**, Radio Sagarmatha took an innovative approach to introducing the Internet to its listeners. Since March 2000, it has broadcast a three-part programme: firstly, "browsing on the radio" discusses websites of interest. The second part explains technical Internet jargon, with questions and requests. Finally, an Internet user is interviewed for tips on how to use information from the Internet. The programme is overwhelmingly popular, revealing a thirst for Internet in Nepal and the radio was inundated with so many requests, that the programme was doubled in length.

6.2.2 Affordability

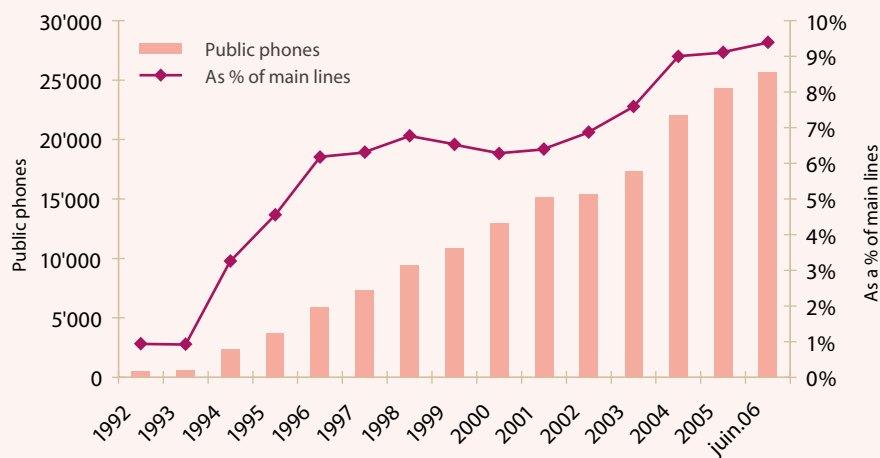
Following market liberalization and the trend toward privatization (Figure 4.5)¹⁶, the ability of governments to influence market prices directly has diminished. Instead, governments are increasingly relying on regulatory agencies to monitor and regulate the price of telecom services (one example given in Chapter three is Telecom Lesotho's application to the Lesotho Telecom Authority for approval of its proposed tariffs for ADSL service).

Ensuring that telecommunication services remain affordable (relative to local income) therefore mainly depends on regulatory control of prices (interconnection and wholesale, as well as retail).

Box 6.3: Senegal's success in promoting telecentres to meet its WSIS commitments

As discussed in Chapter three, the Government of Senegal is seeking to boost access to ICTs (Box 3.2). One way in which it hopes to achieve this is through public telephone centres or "téléboutiques". Senegal was one of the first countries in Africa to liberalize resale of telephone service through public centres and the results have been impressive. From just over 500 telecentres in 1992, there were 24'284 telecentres by the end of 2005, accounting for nearly one in ten fixed lines (Box Figure 6.3). Apart from providing a valuable service to people without a mobile phone or families without a fixed line, these telecentres provide direct employment for some 32'000 people. The popularity of telecentres has continued, despite the rising ownership of mobile phones. Consumers use both mobile and payphones, with mobile users receiving calls on their handsets, but making calls from telecentres, where tariffs are lower.

Box Figure 6.3: Telecentres in Senegal, 1992 - 2006



Note: Public phones include telecentres, public cabins and "phonepoints".

Source: Adapted from ARTP.

Efforts are underway to move from voice-oriented telecentres to multimedia community access points offering Internet access. Although there are 24'000 telecentres, there are only around 800 public locations that provide Internet access. There is a UNESCO project to create around 20 community multimedia centres¹⁹ and a project with the US government to leverage the network of telecentres to create services to benefit SMEs. Senegal is also hooking up schools to the Internet. A NEPAD e-School project aims to provide secondary and primary schools with Internet access. The Government issued a sector note on telecommunications in January 2005, which aims to connect 9'500 villages by 2008 and all 14'200 villages by 2010. At the end of 2005, only 1'713 villages were connected to the fixed line phone network. There is a pilot project testing how fixed wireless technology (e.g., WiMAX) can help accomplish this goal.

Senegal has been a strong international voice for reducing the digital divide. It has been charged by NEPAD with coordinating ICT projects within Africa. Senegal's President Wade conceived the idea of the Digital Solidarity Fund which was adopted by the WSIS and established in March 2005. This achievement was recognized when President Wade was awarded one of the two inaugural awards for World Information Society Day by ITU on 17 May 2006 (Box 6.1). Senegal has also been an active member of the UN ICT Task Force and G8's Digital Opportunity Task Force.

Source: ITU/UNCTAD/KADO Digital Opportunity Platform.

In some countries, initiatives to promote affordability have focused on subsidies to specific groups or programmes to recycle and rehabilitate used equipment.

The Government of **Hungary** launched an early initiative of this sort in 2001, when it set up a public-private consortium (involving Compaq, Matáv and Postabank) to provide PCs and Internet

to 1'400 underprivileged families at a discounted rate. Families could pay for the PC in monthly instalments of USD 25 over three years. **Singapore** offers specific subsidies for computer purchases by families with children of school age. As part of its IN2015 Vision, Singapore believes that interesting schoolchildren in IT at an early age is vital to developing the skilled workforce that will help maintain its competitive standing in the global economy. The Government offers subsidized computers to low-income families with schoolchildren – the statistics show that this programme has had some impact, as computer ownership by families with young children is higher (see Section 4.8.1).

New Zealand has launched a Computers In Homes (CIH) programme with the 2020 Communications Trust to provide over 100'000 New Zealand families who are socially and economically disadvantaged with a recycled computer, an Internet connection, training and technical support and to enable them to become active participants in

the online world. Parallel projects target different groups: illiterate adults, refugees and their families, students and ethnic groups, with Computer Use Manuals available in English, Maori, Samoan and Tongan. The majority of Pacific families benefiting from CIH are Samoan, who enjoy emailing distant family and friends, as it is cheaper than telephoning and can be done at any time of day or night.

6.3 Infrastructure

Infrastructure is the basic building block of connectivity and ICT skills and applications are built on the foundation of accessible infrastructure. With privatization, state plans for the deployment of infrastructure have been superseded in many countries by private operators responding to commercial incentives, but many governments maintain national ICT strategies in recognition

Box 6.4: Multilingualism – or lack of it – in accessing the Internet

The Internet offers huge opportunities not only to access information, but also to create and publish content, provided: (a) you have access to an Internet connection you can afford (b) you have a basic knowledge of how to navigate online (c) you are literate and (d) your language(s) is represented on the Internet. For certain sections of society, any one of these four barriers can prove insurmountable. The last barrier is especially significant, however, for languages supported by small populations or which are spoken by ethnic minorities. Online representation is politically sensitive and can reinforce the domination of certain languages, notably Mandarin Chinese, English, Russian or Spanish.

In Thailand, Internet penetration has not yet reached critical mass. The main barrier facing most Internet users is not access or affordability, but lack of Thai content. To promote Thai content, companies such as Microsoft, Terra Lycos and M-Web have incorporated Thai into their programme and portal designs. M-Web bought the popular Thai portal, Sanook.com, and is incorporating Thai content into its websites and browser software.

To commemorate the 1'600th anniversary of the Armenian alphabet, UNESCO and the Matenadaran Institute launched the B@bel Initiative in 2004 to enhance access to online information in Armenian for three million inhabitants in Armenia and four million Armenians living abroad. The project will develop a Unicode-compatible font to standardize the range of Armenian fonts. Different fonts use non-standard encoding and make printing, publishing and digital design difficult and data transfer (including e-mail) unreliable. Many fonts are limited and cannot recreate the rich styles of traditional manuscripts. This initiative will promote content creation in Armenian and help preserve Armenian culture.

Nepal faces similar challenges, with the Nepali Devanagari language used by some institutions, while others use fonts such as Preeti, Kantipur and Fontasy Himali. Lack of a standard font has inhibited software creation (such as a dictionary or Nepali spell-checker) and made data transfer difficult. Since 2004, UNESCO has supported efforts by Madan Puraskar Pustakalaya, a local NGO, to standardize the Devanagari font, promote computing in the Nepali language and maintain archives in the mother tongue. There are also initiatives to establish portals and discussion forums in local languages.

In Ethiopia, the CyberEthiopia initiative for digital inclusion seeks to foster dialogue, collaboration and knowledge-sharing among Ethiopians (in Ethiopia and abroad) by offering local content and e-forums in minority languages, with a wealth of online resources.

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

that the nationwide development of ICTs needs a coordinated approach (see Chapter four). For many developing countries, ICT strategies are included as a cross-cutting theme in their Poverty Reduction and Growth Strategy (PRGS) framework. ITU was nominated by the WSIS as the focal point for the Action Line (C2) on information and communications infrastructure.

A major initiative on infrastructure in Africa is being undertaken by the **European Union**. The START project (EuroAfrica ICT Initiative) brings together the European Commission with partners, including Sigma Consultants, Meraka Institute of the CSIR (South Africa) and the Panos Institute of West Africa, to develop appropriate ICT solutions for Africa. Overall, the EU plans to double the level of its aid budget between 2005 and 2010.¹⁷

6.3.1 Fixed lines

The privatization of state-owned operators (as illustrated in Figure 4.5) has meant that government targets for roll-out of fixed lines are no longer appropriate, since fixed line markets are increasingly responding to market incentives. As discussed in Chapter three, many people are now 'cutting the cord' and using a mobile phone as their main, and often only, phone. Despite this, fixed line connectivity still has a role to play, especially for Internet access. In urban areas, fixed line connectivity is generally not a question of supply, but a problem of perceived need and affordability. In rural areas, the problem is supply and extending infrastructure to remote areas with low population densities, where the returns may not justify the investment.

Many countries have instituted Rural Telecommunication Development Funds (Box 6.5), including **Egypt**, **Nepal** and **Uganda**. The Government of **Nigeria** has set up a National Rural Telephony Programme (NRTP) to establish effective and affordable telecoms throughout Nigeria, with a backbone ICT deployment. In **Azerbaijan**, the Rural Area Telecommunications Programme is a joint project designed to provide affordable telephone and high-speed Internet service to people in rural areas. It is an Azerbaijani-American joint venture with Caspian American Telecommunications (CAT). **Lao PDR** has also set up a project to provide basic telecom infrastructure to rural areas. Some 2'500 connection points were established over five years to connect three-quarters of all rural districts to the telecom network. Local administration and small firms

have been provided with phone lines, fax, email and Internet, while the public has access through public call offices.

6.3.2 Mobile communications

As shown in Chapter three, cellular mobile communications are increasingly important for access to ICTs, especially for developing countries. Growth in mobile telephony offers the most immediate way of bridging the digital divide. The mobile sector is also notable for a high level of private sector ownership (see, for example, Table 3.2, which summarizes key pan-African mobile strategic investors).

The **World Bank** has promoted the development of mobile communications within its overall InfoDev programme for a considerable time now. Its Private Sector Support Division work with operators and service providers in many countries to extend access to voice and data communications in under-served areas, mainly through mobile and/or fixed line services.

6.3.3 Broadband

As Chapter three suggested, broadband represents the likely future face of the Internet and broadband services are now available in more than 170 economies worldwide.

In **Japan**, the Government launched the "Asia Broadband Programme" in 2002 to bridge the digital divide and promote the social, economical, cultural development of Asia. The programme aims to make Asia a global information hub by 2010 by extending infrastructure, improving technical and human capacity and enriching digital content. The program has established partnerships in ten Asian countries to build network infrastructure and enable people to access broadband platforms at affordable prices. The programme is now also focusing on the development of mobile broadband, with a focus on improved security and other features.¹⁸

In Europe, the Ministry of Transport and Communications of **Bulgaria** (MTC) launched the iBulgaria initiative for broadband in 2004. The first phase of the initiative focused on stimulating new services, applications and content in online public services and e-business, in recognition of the leading role of the private sector. The second phase is now underway, to promote broadband infrastruc-

Box 6.5: Rural Telecommunication Development Funds (RTDFs)

While public telecommunication operators were state-owned (often an extension of the government ministry), they were generally able to operate cross-subsidies and subsidize services to rural areas that were often unprofitable from higher-margin services offered to urban areas, from business revenues or from more expensive international calls. Competition and privatization have obliged operators to rebalance their tariffs to reflect underlying costs, thereby reducing or eliminating cross subsidies, while in some countries, private operators have 'cherry-picked' more lucrative business and urban sectors.

In response to this, governments have sought to establish Rural Telecommunication Development Funds (RTDFs) or Universal Service Funds as an alternative to cross subsidization. Often financed through levies as a small percentage of revenues and operator contributions, RTDFs have had some success in extending rural connectivity. They have also been used by regulators as a mechanism to level the playing-field between incumbents and new entrants (by setting contributions at different levels – e.g., as in the Czech Republic or Malaysia). However, they have sometimes become a target for political meddling or corruption. For this reason, a recent trend has been to seek alternative, more transparent, mechanisms for achieving universal service objectives, such as the reverse cost auction system used in Chile, with support from the World Bank.

Source: ITU.

ture and security through basic state procurement. The Ministry of Transport of the Republic of **Latvia** has launched an ambitious broadband project for rural areas, which seeks to build a broadband network out to 90 per cent of Latvian territory by 2012, with funding assistance from the European Rural Development Fund (ERDF).

In Africa, **Ethiopia** is establishing a national wide-area network to link Federal government with 600 local 'woreda', schools, hospitals and agricultural research centres. The economy is mostly agrarian, but the Government believes a national strategy backed by technology can improve public services and create new opportunities. ETC was enlisted to build a core multi-service network, with the tender awarded to Cisco. A fibre-optic network has been built around Addis Ababa to carry mobile and fixed-line analogue voice traffic, Internet and multimedia services. High-speed fixed and microwave links extend the network to remote areas.

In Latin America, **Colombia**, the Ministry of Communications has launched its Social Telecommunication Programme using telecentres to honor the government's commitments at the WSIS. The "Broadband Connectivity for Public Institutions" project will ensure broadband Internet access to public institutions. The Project has three elements: infrastructure, contents and training. By September 2007, it is intended that broadband connectivity will have been established to 9'151 public institutions, 7'813 public schools, 202 hospitals, 1'048 mayoralities, 31 military bases and 57 agricultural centres.

6.3.4 Wireless communications

Wireless technologies offer easy-to-install, low-cost solutions compared to conventional fixed line infrastructure. The WSIS recognized the promise of these technologies in rolling out infrastructure to more people more rapidly, at lower cost. The flexibility and ease of installation of Wi-Fi and satellite communications mean that networks can be built by local communities, in line with their needs.

The **E-Link Americas** project uses satellite and wireless technologies to deliver affordable Internet access to districts, schools, hospitals and telecentres in rural areas of Latin America and the Caribbean. E-Link's high-speed Internet services are based on VSAT terminals connected to a satellite gateway in Canada using the Ku band, with access points extended using Wi-Fi. Local Service Partners act on behalf of E-Link Americas in Chile, Colombia, Ecuador, El Salvador, Honduras, Guatemala, Nicaragua and Peru.

In Asia-Pacific, **UN ESCAP** has a Programme to develop satellite communications for connectivity to ensure affordable access for underserved communities. The Programme promotes public-private partnerships as a way of encouraging space agencies and others to move forward from prototypes and pilot projects to operational products and services. In **Malaysia**, the Government has launched an initiative to connect remote villages to the Internet using computers, telephones and VSATs. One of the beneficiaries was the 12 communities that comprise Bario in a remote area of Sarawak.¹⁹ Administered

by a public-private partnership, e-Bario demonstrates how ICTs can be used to help marginalized communities in Malaysia develop socially, culturally and economically.

6.4 Utilization

As Chapter two emphasized, the digital divide is no longer about basic connectivity, but increasingly about utilization and how people are using ICTs. New skills are needed to take full advantage of ICTs and participate in the digital world. A range of programmes and grassroots projects have been launched around the world to promote education, telemedicine and e-commerce using ICTs, as discussed in the sections below.

6.4.1 Education

Training in skills is vital in order to be able to take full advantage of ICTs. Many countries are focus-

ing on education as a means of unlocking the promise and potential capabilities of children as future workers. Many countries initiated ICT projects in schools early, to bring the Internet to the next generation. Many countries have also adopted programmes to train the teachers in recognition of their skill needs and the fact that, by training up a single teacher, many more pupils can be reached (Box 6.6).

As early as 1995, the Government of the **Republic of Korea** determined that all schools should have Internet access. By 2001, all schools were equipped with a local area network, computer lab and access to the government backbone network. Connection speeds of 256 kbit/s were free, with discounts for higher speeds. Today, all schools have a 2 Mbit/s connection and multimedia equipment. The Rep. of Korea is reaping the rewards of its early initiative, with one of the highest Utilization scores in the DOI (see Section 4.2.1).

In Asia, **Thailand's** SchoolNet project connected 5,000 schools to the Internet by the end of 2002, including all secondary and 1'500 primary

Box 6.6: Teaching the Teachers

The capabilities of teachers determine the success of their students. In some countries with skills shortages, programmes are underway to ensure that teachers are fully in command of their subject (although ICT is arguably one of the few subjects where some pupils may be ahead of their teachers!).

ITU has established an Internet Training Centres Initiative for Developing Countries (ITCI-DC). Designed to help people develop IT skills, ITCI uses a "train-the-trainer" methodology to spread ICT skills and awareness. ITU then transfers the Internet/IP related training programmes developed to training or educational institutions in each country. The multi-million dollar three-year project brings together public and private actors, NGOs and local businesses to increase the number of ICT skilled workers and help governments and local firms create incentives to avoid the "brain drain" that stifles ICT modernization in many developing countries.

In **Rwanda**, the Kigali Institute of Education (KIE) has established a network of Regional Distance Learning Centers and provides technical assistance for training their staff. KIE staff have developed training materials using ICT-based pedagogical modules. ICT staff are also trained in information management systems and web design. In Uganda, the Uganda Curriculum Development Centre, Makerere Institute of Computer Science and UNESCO designed an "ICTs for African Educators" CD-ROM. The multimedia CD-ROM familiarizes teachers and students in computer-assisted learning techniques to create an interactive learning environment.

In **Asia**, UNESCO has established an "ICT Portal for Teachers" with funding from the Japanese Government to train teachers in computer literacy and educational software for teaching and learning. The Portal seeks to help teachers integrate ICTs into their classroom activities, with up-to-date sources. It is hoped that the portal will enrich the school environment with quality multimedia materials and better-resourced teachers.

At Wellington Girls' College in **New Zealand**, the technical learning needs of the school started to outstrip the ICT skills of staff. Sponsored by the Ministry of Education, under its "Technical Angels" programme, students are given training in ICT so they can mentor and support college staff in ICT. Each Tech Angel mentors two teachers, teaching topics ranging from general computer use to scanning, movie-editing and burning CDs.

Source: WSIS Stocktaking Database at: www.itu.int/wsisis/stocktaking.

Box 6.7: Initiatives in higher education and research

Universities and research institutions played a leading role in developing the Internet, which started as a military network but was quickly adopted for data exchange and research (in most developed countries, the majority of firms were relative latecomers to the Internet). In developing economies, higher research institutions were also among the first to be connected - for example, the University of Tunis claims to have established the first Internet connection in Africa (see Section 4.6.1).

Various initiatives seek to ensure that the Internet continues to serve higher education institutions in research and long-distance learning. Since 2003, the **Virtual University of Tunis**, in partnership with the Higher Institute of Technological Studies has provided long-distance courses using multimedia technologies. The programme aims to widen access to higher education, improve quality and educate the future workforce. Malaysia has established a Multimedia University (MMU) in its Multimedia Super Corridor. MMU focuses solely on high-tech subjects, such as software development, digital media and IT engineering.

The **Asia Pacific Initiative** (API) for research was launched in 2003 at the World Summit on Sustainable Development to promote collaborative research, online learning and capacity-building. The API is a knowledge-sharing initiative that harnesses creative power through new technologies. It created a new Media Studio for online multimedia broadcasting at the UN University, which functions as a networked organization with partner universities, research institutes, NGOs and businesses in Asia. Further pilot experiments are underway in IP/Internet broadcasting, video-on-demand, e-learning and interactive communications.

In **Brazil**, a pilot project in Rio de Janeiro aims to extend high-speed academic networks to provide connectivity to community centres in the slums, using Wi-Fi links. This project is being implemented in partnership with the Federal University of Rio de Janeiro, the Ministry of Science and Technology of the State of Rio de Janeiro and two local NGOs (Vivario and CDI). It aims to show how high-speed networks can be used with wireless technologies to serve low-income communities in urban areas.

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

schools (Thailand's universities were already connected to the Internet). The Telephone Organization of Thailand (TOT) provides free Internet access and schools only have to pay the cost of a local phone connection. **Malaysia's** Smart Schools programme teaches students about ICTs. The Malaysian Government allocates an average 20 per cent of its annual budget to education and is seeking to make all schools "smart" by 2010. The Mobile Internet Unit (MIU) uses "smart" buses to visit rural schools, leaving behind PCs, training materials, and where possible, an Internet connection.

The Ministry of Education of **Turkey** has launched the School Connectivity project to provide Internet access to computer laboratories in 42,500 primary and secondary schools, often in rural districts. This initiative has opened up computer labs to local communities after school-hours, so local people can use broadband.

In Latin America, **Colombia's** Computers for Schools programme had provided 19'223 refurbished computers from firms to 2'17 schools

by 2003, benefiting some 750'000 youth. The programme aims to become long-term. In **Chile**, the "Wireless IP Multimedia Diffusion Project" has connected 60 secondary schools using Wi-Fi, with the help of the National Universities Network. It provides educational materials to complement students' schoolwork.

In Africa, **Ethiopia** has launched its 'Schoolnet' programme, with a nationwide network that will connect up over 450 secondary schools. The 'Schoolnet' project already delivers educational content to schools from the Ethiopian Media Agency, using terrestrial and satellite networks and will broadcast TV-based educational content. More schools are coming online at a steady pace. The **Cape Verde** government launched the Projecto de Consolidação e Modernização da Educação e Formação (PROMEF), with funding from the World Bank. PROMEF sought to analyze how ICTs can be used to improve education and training systems in Cape Verde. It also created databases with budgetary, staff, scholarship and student information.

Box 6.8: Geographical Mapping of Malaria in Africa

Sub-Saharan Africa has the highest incidence of disease in the world and malaria is one of the main causes. Over 90 per cent of malarial deaths occur in sub-Saharan Africa. Detailed mapping of malaria incidence had never been carried out in Africa, making malaria control difficult. The **MARA** programme is run by the South African Medical Research Council as a database project that has compiled over 10'000 data points from the literature and country visits. It has produced the first collection of disease estimates and the first map of malaria distribution. It uses Geographical Information Systems (GIS) and spatial statistics to show the density and seasonality of malarial infections. Over 3'000 maps of malaria models have been sent to malaria control programmes, departments of health and research institutions in endemic African countries. All maps and reports in English and French are available from the website or by CD. This collaboration could serve as a model for disease information systems in developing countries.

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

6.4.2 Telemedicine

Applications of ICTs in health (telemedicine or e-health) are evolving fast in: raising awareness and basic knowledge of health and hygiene; improving preventive care; improving the efficiency of Health Management Information Systems; and for long-distance diagnosis, investigation, online consultation and even operations over the Internet. ICTs and telemedicine solutions can play an important role in improving health-care in developing countries, where people may have to travel long distances to receive medical attention.

This year sees the culmination of the seven-year USD 200 million Health Internetwork project of the **World Health Organization (WHO)** to provide access to high-quality, timely health information for medical professionals, researchers and policy-makers in developing countries using the Internet. One of the major initiatives of the UN Millennium Action Plan, this public-private partnership has focused on:

- » Content creation: WHO teams have completed country assessment studies to work with local partners to create local Internet portals of health information;

Box 6.9: ICTs in the fight against HIV/AIDS

A range of initiatives are underway using different communication technologies to combat the spread of AIDS/HIV.

The high-speed capabilities of more recent ICTs should not detract from the power of radio to reach huge audiences in developing countries, especially where literacy rates are low. In **Ethiopia**, the radio series "Journey of Life" used real-life characters with whom the audience could identify to encourage people to protect themselves against HIV/AIDS. It showed how easy it is to become infected with HIV to educate listeners on precautions. In **Senegal**, Radio Oxyjeune broadcasts music and chat in the capital, Dakar, and hosts live phone-in shows in national and local languages to reach as wide an audience as possible. It tackles subjects such as HIV/AIDS and women's rights. Anonymous interviews with HIV-positive individuals have helped promote safe behavior. Organizers believe that personal stories are most effective in the fight against AIDS.

The **Staying Alive** campaign is a movement for AIDS awareness and prevention. Its Internet site promotes AIDS awareness, while a multimedia campaign is launched every year on World AIDS Day (1st December). Its campaigns involve celebrities, public announcements and on-air or online products for distribution for TV/radio partners (such as documentaries, concert events, news items and discussion programmes).

In **India**, Population Services International (PSI) has run a telephone helpline for HIV/AIDS prevention since 2002 in Mumbai as a low-cost, anonymous and confidential communication channel. Counsellors provide information, support and referrals. A helpline is helpful, as the idea of talking to a doctor about sexual health issues can be culturally difficult.

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

Box 6.10: Information over Technology in e-Agriculture

A recent survey conducted by the UN Food and Agriculture Organization (FAO) found that nearly half of all stakeholders working in agriculture who replied to the survey identified e-agriculture with improvements in processes such as information dissemination, access and exchange, communication and participation. In contrast, only a third highlighted the importance of technical hardware and technological tools, such as mobile phones, computers and the Internet.

The results of the survey suggest that initiatives in Africa to promote agriculture through new and improved types of information-sharing are on the right track. African companies are experimenting with new information services to eliminate intermediaries, improve productivity and get a better deal for African farmers. TradeNet, a software company **Ghana**, has unveiled a simplified form of eBay over mobile phones for agricultural products across more than ten countries in **West Africa**. Buyers and sellers post information as to what they are after and their contact details, which are then circulated to 'matched' subscribers using SMS text messages in several languages. Interested parties can then contact others directly to do a deal. Similar projects are underway for daily price information for fruit and vegetable exports in **Burkina Faso, Mali and Senegal**. Such initiatives can improve the flow of business information and help reduce costs and boost profits.

The **Ministry of Agriculture of Malaysia** has launched Taninet or "Your friendly agricultural website", equipped with articles, a bulletin board, query and FAQ services and an event directory on agricultural topics. It has databases with up-to-date information on agricultural products and expert references. TaniNet also provides e-commerce services to fund its existence.

In **India**, the Murugappa Group has set up telecentres and an online portal to access market data without intermediaries or middlemen. Sugarcane farmers in Tamil Nadu, coffee planters in Coorg and soy farmers in Madhya Pradesh are using the site to sell their products at better prices. Farmers can browse the news and weather reports and use banking, micro-credit and micro-finance facilities. They can examine offers from other farming companies for fertilizers, farm tools and seeds etc. This model restores ownership of the supply chain to the farmers in an equitable manner, to the benefit of the farmers.

Source: WSIS Stocktaking Database at: www.itu.int/wsis/stocktaking.

- » Connectivity: the project has sought to establish over 10'000 Internet sites, maintained by the WHO, NGOs and local partners;
- » Capacity-building: WHO teams have provided hands-on training in how to manage portals and computer systems.

The Health Internetwork portal provides access to a vast library of the latest information on public health, with over 1'000 scientific publications, statistical data and vital information for research, health policy and health service delivery. It also offers applications such as epidemiological tools and mapping systems to chart the spread of disease, as well as distance learning courses. Pilot projects have been launched in eight countries in Africa, Central Asia and Eastern Europe.

In **Malaysia**, e-Farmasi is a medical database jointly developed by the Ministry of Health and Pharmaceutical Society, with information on pharmacies, illnesses and medicines (over 27'000 products, side-effects, directions for use etc.) It helps pharmacists manage their pharmacy and

maintain patient medication records. The public can ask questions and buy medicines over the website. The site also offers a diagnostic guide, with health advice and guidance. Medicines can be searched by ingredient or brand-name. **Egypt** has gone one step further and launched an online market place for its pharmacies to coordinate their internal purchases of medicine at cheaper prices (CiraNet.com). Similar health information portals exist in **Hungary** (MEDINFO), **Russian Federation** ("Healthy Russia 2020") and **Nepal** (the NGO HealthNet).

In the **United States**, the medical services company, Medem Inc, launched the iHealthRecord Initiative in 2005 as an online health information resource (www.ihealthrecord.org). The system allows patients to access, update and share their medical records with doctors over the Internet. Vital medical information is not always available to emergency workers, leading to complications, constraints or delays. It is hoped that the system will reduce risks of mistakes (such as prescription errors), streamline documentation and reduce the need for visits. The service is free to patients who

access it directly. Doctors, hospitals and medical groups pay for the system at around \$US25 per month per patient.

In **Mozambique**, ITU has helped the government to establish a network between the central hospitals of the capital city, Maputo, and Beira. The network allows doctors to confer and share medical records to ensure that patients in their respective cities get the best possible care. Medics in Beira now have instant access to radiologists in the capital, which has significantly improved patient care. Similar telemedicine projects with which ITU is involved are currently underway in **Senegal**, **Uganda** and **Ukraine**.

6.4.3 Building technical capabilities for economic development

ICTs are an engine for economic growth in their own right. Economic poverty is directly related to information poverty, in people's ability to use ICTs to get a better deal for their products or improve production processes more efficiently. In many applications in developing countries, the power of information is emphasized in making markets function more efficiently, addressing market failures, removing intermediaries and empowering farmers (Box 6.10). ICT skills are also important, however, in training the workforce in new technologies and improving productivity.

Since its launch in October 1997, the **Cisco Networking Academy** has spread to more than 150 countries and taught over 1.6 million students, who have enrolled in more than 10'000 Academies in high schools, technical schools, colleges, universities and community organizations. The Academy has helped in technical training for more than 5'000 ICT technicians in 32 countries, of which a quarter were women. The Programme is a comprehensive e-learning program, delivering web-based content, online assessment, student performance tracking, hands-on-labs, training and support, and preparation for industry standard certifications.

In Asia, UNDP's Asia-Pacific Development Information Programme is establishing **ICT Business Development Centres** in countries such as Vietnam²⁰ to support Asian cooperatives and their umbrella organizations to use ICTs. It further aims to install national and regional cooperative networks. These are local telecentres providing Internet access, training and business information

for SMEs. The **Digital Freedom Initiative** started out in the US and Senegal in March 2003 and is being extended to by Peru, Indonesia and Jordan. It places volunteers in businesses and community centres to provide SMEs with the necessary ICT skills and knowledge to compete more efficiently in the global economy.

6.4.4 Youth

The WSIS Declaration of Principles recognized that young people are the future workforce and the leading creators and earliest adoptors of ICTs (para 11). The 2007 World Information Society Day, to be celebrated on 17 May, has this year the theme of "Connecting the Young".²¹

The *Voices of Youth*, an initiative of **UNICEF**, started as a way for young to send messages to world leaders at the World Summit for Social Development, held in Copenhagen in the spring of 1995. Today, it is a vibrant online meeting place (www.unicef.org/voy) where young people from around the world explore, speak out and take action on global problems. The portal provides multiple resources: interactive educational games and training, discussion boards in English, French and Spanish but also brain teasers and lots of information on children's rights.

UNESCO has launched *World Heritage in Young Hands* as a flagship projects for youth from over 130 countries. This Project gives young people a chance to voice their concerns on preservation and promotion of cultural and natural heritage sites from local to global levels and to become directly involved in related projects. The overriding aim of the project is to mobilize young people to contribute to world heritage preservation in many different ways: for instance, by establishing an online learning community (<http://whc.unesco.org/education/sindex.htm>).

In the **Republic of Nauru**, UNDP has launched a targeted project order to maximize the use digital and satellite-based radio communication resources to serve the education and development needs of students and young people. This project aims to combine existing satellite communication networks at the University of the South Pacific (a regional leader in distance education via radio waves), so students and the general public can receive educational materials as well as broader community development information.

6.5 Conclusions

At the WSIS, governments made a strong commitment to building a people-centred, inclusive and development-oriented Information Society for all, where people can access and use information. During the Tunis Phase, stakeholders stressed their ongoing commitment to remain fully engaged to ensure the implementation of the WSIS *Plan of Action*. This Chapter has highlighted some of the activities and initiatives that are underway around the world to make the WSIS

vision a reality. From this review, it is evident that not only has WSIS succeeded in raising the profile of ICTs and their role in the Information Society of tomorrow, but it has also established an agenda and a framework for coordination, especially through multi-stakeholder partnership. Significant progress has been achieved in building a richer and more inclusive Information Society in which everyone can participate. Although the WSIS set 2015 as the date for the formal review of implementation, the review of projects and activities underway around the world presented here shows that WSIS implementation is on track.

Notes for Chapter Six

- 1 For reference, the UN General Assembly (UNGA) adopted the WSIS as a Summit in two phases in Resolution 56/183, available at: www.itu.int/wsis/docs/background/resolutions/56_183_unga_2002.pdf, on 21 December 2001. In the Tunis Agenda for the Information Society, one of the four WSIS outcome documents, the UNGA is called upon to make an overall review of the implementation of WSIS outcomes in 2015 (para 111). For more information about WSIS and its implementation, see www.itu.int/wsis.
- 2 For more information on the Internet Governance Forum, see: www.intgovforum.org/. The first meeting of the IGF was held in Athens, 30 October – 2 November 2006.
- 3 For more information about the voluntary Digital Solidarity Fund, see: www.dsf-fsn.org/. The fund is financed according to the “1 per cent of digital solidarity” principle, whereby some 1 per cent of the costs of ICT procurement projects are donated to the fund.
- 4 For more information on national implementation, see the WSIS stocktaking website at www.itu.int/wsis/implementation and also the World Information Society Day site at: www.itu.int/wisd/2007/index.html.
- 5 For more information on national implementation, see the website at: www.itu.int/wisd/2007/wsis-implementation/.
- 6 For more information on the Egyptian “Golden Book”, see: www.mcit.gov.eg/ar/brochures_ar/Golden%20Book%20Final2007211155321.pdf. The individual projects are also entered and can be searched in the ITU-hosted WSIS stocktaking database, at www.itu.int/wsis/stocktaking.
- 7 For more information on OSILAC see: www.eclac.cl/socinfo/osilac/default.asp?idioma=IN and on eLAC2007 see: www.eclac.cl/socinfo/elac/default.asp?idioma=IN.
- 8 For more information on UNGIS, see: www.ungis.org/.
- 9 For more information on UN CSTD, and the report of the SG on WSIS implementation, see: www.unctad.org/Templates/Meeting.asp?intltemID=4066&lang=1.
- 10 The circular letter on WSIS stocktaking is available at: www.itu.int/wsis/stocktaking/docs/dm_1002-wsis_stocktaking-e%20_3_.pdf.
- 11 For information on the ICT Eye database, please see: www.itu.int/ITU-D/icteye/Default.aspx.
- 12 A more complete selection of ICT success stories can be found at: www.itu.int/osg/spu/wsis-themes/ict_stories/index.phtml.
- 13 For more information on the meeting of action line facilitators/moderators, see: www.itu.int/wsis/implementation/consultations.html#first.
- 14 Launched by The Chinese Ministry of Science and Technology, China International Center for Economic & Technological Exchange (CICETE) and China Rural Technology Development Center (CRTDC), with support from UNDP.
- 15 Literally “fostering digital solidarity”: see: www.africaden.net/.
- 16 See “Trends in Telecommunication Reform 2007” for the latest summary statistics of proportion of privatized operators throughout the world.
- 17 See “Financing ICT for Development: The EU approach”, available at: [www.iicd.org/iicd/articles/EU-Financing-ICT4D-\(English\).pdf/](http://www.iicd.org/iicd/articles/EU-Financing-ICT4D-(English).pdf/).
- 18 For more information, see: www.dosite.jp/e/ja/aisa/index_asia.html.
- 19 For more information on e-Bario, see: www.unimas.my/ebario/Main_index.htm.
- 20 www.apdip.net/projects/ictrnd/2004/L04-vn/
- 21 For more information, see: www.itu.int/wisd/2007/index.html.