



UN Photo/Kibae Park

## Chapter 5

### **Bridging the digital divide by reaching out to vulnerable populations**

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## Chapter 5

# Bridging the digital divide by reaching out to vulnerable populations

Sustainable development cannot be reduced to environmental protection alone.<sup>1</sup> Socioeconomic factors are just as important, and so are the institutional frameworks undergirding development and development management initiatives. Social exclusion and lack of adequate access to public services can significantly undermine sustainable development. E-government, in improving public service provision and delivery, and in promoting inclusion – with due regard to the needs of vulnerable populations – can be instrumental in mitigating the effects of exclusion and improving people’s livelihoods. E-government, in this sense, is instrumental in promoting a sustainable development that is for the people.

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Broadband Internet can help people in rural and remote areas interact with doctors online and facilitate education of young people where physical facilities are unavailable.

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Just as clean environment alone cannot address sustainability, the availability of computers or the Internet does not in itself determine who can access and use ICTs and e-government services effectively. Also important are digital skills and an awareness, willingness and capacity to engage with ICTs and e-government. One illustration comes from broadband, which is not solely about high-speed Internet. Coupled with the right e-government strategies, it can be a very effective tool in fighting poverty, increasing literacy and protecting the environment.

For instance, e-government can deliver public services such as health and education more effectively through broadband, with e-health allowing people in rural and remote areas to access doctors online and e-education enabling youth to receive Internet-based education that would not be physically available. It can also contribute to the design, provision and delivery of more accountable services by incorporating the inputs of wider segments of society that otherwise would not have the means to contact their local or national representatives or representative institutions.

Research shows that every 10 per cent increase in broadband penetration accelerates economic growth by 1.38 per cent in low- and middle-income countries.<sup>2</sup> E-government, powered by broadband, can improve people's livelihoods while giving them a voice in decision-making processes through enabling literacy and education for the masses and fulfilling their local information needs.

Built on these premises, this chapter focuses specifically on vulnerable populations and tackles the challenges they face in accessing and using ICTs and e-services in the public sector. The challenges are presented along four lines of analysis: language and literacy, abilities and capacities, gender and income, and location and age. The e-government divide in the case of vulnerable populations is thus about how governments of the world fare in facilitating digital access for the illiterate and low-educated, persons with disabilities, the poor, women, children, the elderly, and communities living in rural and remote areas.

## 5.1 Factors affecting e-government access and use

There are many ways to define and understand the digital divide. The 4A perspective – Awareness, Access, Attitudes and Applications – emphasizes the need to examine the local/community-level digital gaps in addition to those at national/global levels.<sup>3</sup> The access-use definitions underline the socioeconomic factors such as income, gender, life stage and geographic location.<sup>4</sup> The phased-digitalization definitions focus on degrees of progress along infrastructure, skills and competition in the first phase, diffusion of devices in the second phase, and impact in the third and final phase of digitalization.<sup>5</sup> The business-model definitions concentrate on the difference between the productive assets or capital (info-density) and the consumables or labour (info-use) of ICTs,<sup>6</sup> and purpose definitions extend the scope of digital divide from equipment and skills to variables such as autonomy of use and social support, attributes of governance systems,<sup>7</sup> and reasons for using the Internet (social, political, economic versus entertainment).<sup>8</sup>

These and other definitional debates, as well as the parallel methodological quest for determining the adequate indicators of the digital divide, point to a trend that moves from the traditional technology-oriented measures of ICT tools and Internet usage in the 1990s to user-driven indicators of skills and purpose of information usage in the 2000s, to the most recent indicators of social learning and impact conjuring ICT as an enabler of development in 2010. It is this latter perspective that puts the greatest emphasis on targeted policy areas for specific at risk or vulnerable groups, such as education, health and digital literacy for women, youth, the elderly, the disabled, and the less educated and low income groups. Community involvement and the production of local content by local populations, including the vulnerable groups in particular, now gain increased significance and become some of the new parameters for assessing the digital divide and e-government's role in bridging it.<sup>9</sup>

The access of populations to ICTs and their effective engagement with e-government processes

can be broken down to individual (micro), local-community (micro-meso), national-society (meso) and international (macro) levels of analysis.

Each level of analysis covers:

- ICT penetration or supply comprising material issues such as technology, infrastructure, equipment and ICT tools and policies;
- ICT take-up or demand including human issues such as skills, usage, and content; and,
- ICT environment or context such as the degree to which economic, political and civic liberties can interact to determine who will have better access to ICTs and e-government while getting the most out of them.

Vulnerable populations are particularly important in this comprehensive perspective because the standard ICT penetration, ICT take-up and enabling environmental conditions may not always be applicable to their specific attributes, needs and wants.<sup>10</sup> Thus, a specific focus on vulnerable populations is useful and necessary for overcoming the barriers that governments of the world face in their drive to ensure the digital inclusion of all citizens, thereby contributing to efforts towards ensuring sustainable development for all.

Table 5.1 summarizes some of the divide issues, indicators and policy areas contained under each one of the three pillars of ICT penetration or supply, ICT take-up or demand, and ICT environment or context, as well as the cross-pillar category of vulnerable populations.

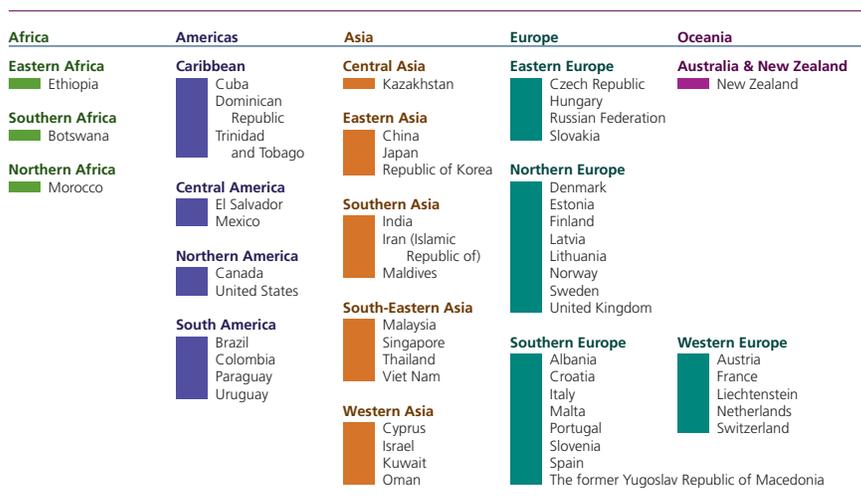
An appropriate focus on extending e-government to vulnerable groups is critical to ensuring that e-government supports inclusion and development for all. Many countries have incorporated this inclusive e-government approach with special sections devoted to the marginalized groups on their websites offerings.

The United Nations E-Government Survey 2012 pays specific attention to vulnerable groups and how they are able to access and use e-information and e-services. An overall picture of how e-government across the world integrates vulnerable groups is provided in figure 5.1. The main question is whether the national government website contains specific sections on at least one of the vulnerable groups, namely the poor, the illiterate, the blind, the elderly, immigrants, women and youth.

**Table 5.1 Components and subcomponents of the conceptual map of digital divide<sup>11</sup>**

<b>ICT penetration or supply</b>	<p><b>Technology:</b></p> <p>Desktop, laptop, smart phones, mobile computers, broadband, Internet service providers (ISP), cost, teledensity such as computers per household, number of Internet hosts, international telephone traffic, communications infrastructure, ICT infrastructure quality.</p> <hr/> <p><b>Government policy:</b></p> <p>Government prioritization of ICT; policies regarding ICT and minorities, ethnic groups, other risk groups; telecommunications policy and joint government, private sector and civil society programmes; investment in ICT infrastructure, education, research and development; ICT expenditures, training and awareness-raising; quality of mathematics and science education; regulatory issues such as universal access, consumer advocacy, pricing policies, interconnection agreements, licensing for ISPs, spectrum licensing, infrastructure-sharing; use of social media to increase e-participation, foreign direct investment and openness to trade, competition policy, restrictions on access or content.</p>
<b>ICT take-up or demand</b>	<p><b>Access:</b></p> <p>Network connectivity, affordability, reach, service provision, speed, broadband access</p> <hr/> <p><b>Usage:</b></p> <p>Computer use, Internet use, time and frequency, skills (literacy, education, knowledge of hardware and software), capacity, creating a presence on the Internet: purposes of information use (health, politics, employment, entertainment), ability to extract information.</p>
<b>ICT environment</b>	<p><b>Social-political-economic factors:</b></p> <p>Legal and regulatory framework, regime type, governance system, macroeconomic environment, poverty, local economic environment, trust, political will, leadership, habituation (integration of technology and Internet into the culture), structural inequalities, stereotypes, cultural values, ratio of females in the labour force, availability of scientists and engineers.</p> <hr/> <p>Vulnerable populations are part and parcel of the three main pillars. Socio-demographic factors (income, gender, age, occupation, geographic location, ethnicity and race, religiosity, language, physical capacity, affordability) arise under all three pillars above. Yet, they are particularly instrumental in situating the vulnerable groups on the map of the digital divide.</p> <hr/> <p>Salient ICT issues specific to vulnerable groups include: indirect benefits of ICTs through intermediaries,<sup>12</sup> the rise of social media with lower technical skill requirements,<sup>13</sup> cell-only wireless users and the implications for the changing face of the digital divide.<sup>14</sup></p>

**Figure 5.1 Inclusion of at least one of the vulnerable groups on the national website**



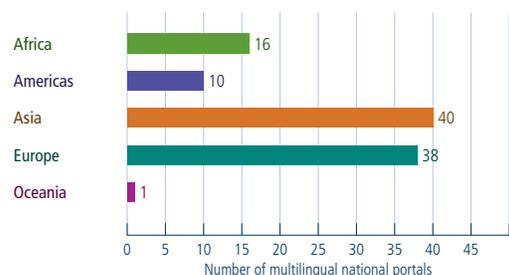
Gaps in access to e-government services are often associated with connectivity hurdles such as the lack of affordable equipment, telephone lines and Internet connections.

The results show that, as of 2012, only 28 per cent of Member States (56 out of a total of 193 countries) have included such sections on their national websites. Within the group of 56 countries that do provide such information on vulnerability, Europe leads the way with about 50 per cent of them. Asia-Pacific and Latin America are the runners-up with 20 per cent each. Only Botswana, Ethiopia and Morocco make it to the list from Africa.

There are many issues that contribute to the digital exclusion of vulnerable groups culminating in the underutilization of e-government services by those who need them most. Among the important issues of digital exclusion are infrastructure and access. Gaps in citizens' access to and use of ICTs and e-government services often consist of connectivity hurdles, such as the lack of affordable access to PCs, Internet devices, modems, telephone lines, and Internet connections. One possible partial solution to this infrastructure hurdle could be to devise cheaper means of access such as the creation of publicly accessible kiosks in Internet community centres, which would also bring down the access price.<sup>15</sup> Another approach could emphasize users' attributes, needs, and wants since infrastructure and access are often mired in social, economic and political contexts including differences of language, literacy, education, age, disabilities, capacity, income, location and gender. In other words, even if Internet community centres and machinery are made available and affordable, large segments of populations across countries might still be unable to reach or use them effectively due to the need for extra or non-standard technical features, outreach policies and/or e-government skills sets.

Figure 5.2 Multilingual national portals

National Portals with content in more than one language

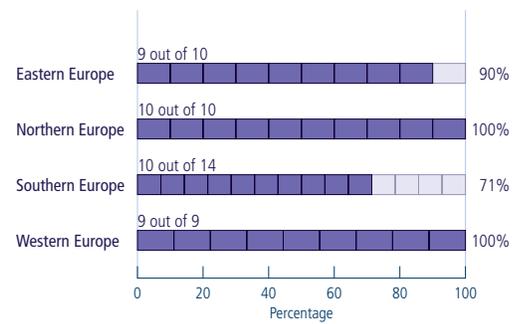


### 5.1.1 Language and literacy

One of the most important obstacles to e-inclusion, particularly among vulnerable groups with little education, is language. Today, more than 80 per cent of all websites are in English.<sup>16</sup> Yet only one third of the users worldwide speak English as their native language.<sup>17</sup> The illiterate poor seldom have the means to learn a foreign language.

Figure 5.3 Multilingual European portals

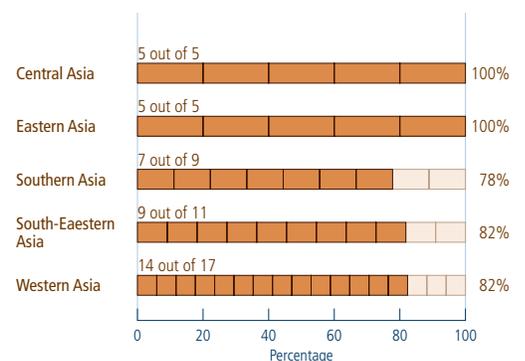
Percentage of countries in Europe with national portals having content in more than one language



In this respect, both public education and local content production become paramount. The 2012 Survey finds cautiously optimistic rates regarding moves towards digital multilingualism, including local content production. As shown in figure 5.2, more than half (105 countries) of the

Figure 5.4 Multilingual Asian portals

Percentage of countries in Asia with national portals having content in more than one language



193 Member States are now offering their national websites in more than one language.

In using language to reduce the digital divide, Asia is the leader with 40 countries offering their national websites in more than one language. Asia is followed closely by Europe, with 38 such countries.

Tables 5.2 and 5.3 delve into the sub-regional trends of the leaders. Asia, East Asia and Central Asia are fully multilingual digitally. In Europe, Western and Northern European countries are.

Latin America and Oceania have room to make progress. Only eight countries in Latin America and Samoa in Oceania provide their national websites in more than one language.

Several African countries have already undertaken twin actions: to reach in – to their nationals in their official language(s)–, and to reach out – to the rest of the world through English and/or other commonly spoken languages worldwide. These countries are Algeria, Botswana, Cameroon, Cape Verde, Chad, Egypt, Equatorial Guinea, Ethiopia, Madagascar, Mauritania, Morocco, Somalia, Sudan, and Tunisia.

The fact that some countries do not yet offer their national websites in more than one language does not mean that they are not making progress towards multilingualism on other grounds. Educational programmes and training in foreign languages and ICT literacy, particularly targeting the vulnerable groups, are widespread measures applied by countries to overcome the digital linguistic barrier. Some examples are provided in box 5.1.

The provision of government websites in the official national and local languages of minority and other groups, particularly through their direct involvement, could help in mitigating the e-government access and use divide by expanding reach, promoting awareness and instilling ownership in the design of e-services and products. These findings also imply that translating the national websites into English can be helpful in promoting inclusion in the broader information society at the global level.

### 5.1.2 Abilities and capacities

Education and digital literacy are particularly important for citizens with different physical and cognitive abilities. Considering that more than 18 per

#### Box 5.1 Selected examples of e-government initiatives of education to bridge the digital divide

Country	Initiatives
Uruguay:	Plan Ceibal
South Africa:	Digital Doorway
Nepal:	Coppades
France:	Ajialcom

**Uruguay:** Plan Ceibal

- A laptop to every student enrolled in the public school system.
- Adaptive technology in the laptops for students with special needs.
- Co-ownership through engagement of students/parents in design.
- Aiming at adaptive technologies en masse and at reduced cost.



**South Africa:** Digital Doorway

- Network of robust computer systems in rural communities to interconnect them – among each other and to the Internet.
- Emphasis on awareness-raising and computer literacy with community-driven learning programmes.



**Nepal:** Coppades

- ICT infrastructure and connectivity to rural public schools.
- Solar Power enabled online education project for rural schools with no connectivity to electricity grid.
- Connecting schools and students through email and their newly created school websites.



**France:** Ajialcom

- Community technology learning centres for youth in underserved areas.
- Preparing youth to join the workforce, increasing computer literacy and supporting local socioeconomic development.



cent of the world’s population is disabled in some way,<sup>18</sup> several countries have put forth innovative programmes of capacity-building that respond to the specific needs of these vulnerable groups.

Persons with disabilities face substantial barriers to access and use e-government. Web pages that use small fonts or particular colour combinations may be unreadable for the visually impaired. Similarly, audio or video content on web pages may not be useful for the hearing impaired. Those with motor impairments may require special features on websites so that they can be navigated without a pointing device.

Many persons with disabilities use adaptive technologies to overcome the challenges they face in consuming online content. Examples include screen readers and special pointing or input devices. The former are used by the visually impaired to render a written webpage as an audible description of the page. The latter enable those with motor disabilities who may not be able to manipulate a standard keyboard and mouse to interface with a computer and navigate online content.

While these technologies offer persons with disabilities tremendous opportunities, they can be sensitive to technical details of website implementation. Such technical flaws in implementation are typically not visible on a webpage as rendered by a standard browser. They can, however, be detected using automated tools that read the underlying HyperText Markup Language (HTML) in which web pages are actually stored and transmitted.

E-government can and often does represent a tremendous opportunity for persons with disabilities by bringing services to them in a way that cannot be accomplished effectively via physical delivery. Paradoxically however, insufficient attention to the needs of the disabled in e-government planning and implementation can actually disadvantage this vulnerable group even more.

Therefore, while capacity-building programmes of ICTs for persons with disabilities are important, they are not the only remedy. Often times, simple technical tweaks such as adding labelling to images on the web so that screen readers can find them, providing audio Captchas<sup>19</sup> for the visually impaired or designing devices with graphical interfaces or tactile inputs can be highly effective means for mitigating the digital divide faced by population groups with different visual, hearing and other abilities.

The 2012 United Nations E-Government Survey measures the digital divide faced by persons with disabilities through three questions:

- Does the site offer video of sign language?
- Does the website offer a service to read the content of pages aloud via a speaker or headphones?
- Can the design of the site allow for configuration of font size, font type, font colour and background colour?

Figure 5.5 Assisted sites

Number of countries with national portals offering video of sign language, services to read the content of pages aloud, and configuration of font size, font type, font colour and background colour



The first question targets mainly those people with different hearing abilities. The second does the same for those with different visual abilities. The third question is also relevant for the visually challenged, as well as for the elderly.

Results show that the world is only beginning to tackle digital ability. Figure 5.3 and table 5.2 show the associated findings of this year's Survey.

Table 5.2 National websites with accessibility features

	Number of countries	Percentage
Read content aloud	13	7%
Video of sign language	7	4%
Configure fonts and/or colours	61	32%

The findings demonstrate that only seven countries offer video of sign language on their national government websites, and except for Canada, they are all situated in Europe. The trend-setters in digital ability are Austria, Finland, France, Portugal, Sweden and the United Kingdom.

The Survey also shows that only 13 countries offer services to read their national government web pages aloud via a speaker or headphones. One would have expected the previous seven to have undertaken this functionally equivalent step. Yet, surprisingly, except for France and Sweden, there is no overlap between the two groups.

**Box 5.2 Automated search for barriers to usage<sup>22</sup>**

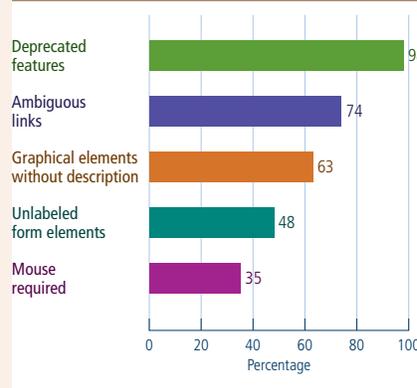
An automated search for barriers to usage was carried out by the United Nations E-Government Survey 2012. E-accessibility checker software<sup>20</sup> was used to test the primary national website of each country to assess how well it conforms to the World Wide Web Consortium’s (W3C) standards promulgated under the Web Accessibility Initiative (WAI) and embodied in the Web Content Accessibility Guidelines (WCAG),<sup>21</sup> version 1.0. The tool only tests those aspects of the guidelines that can be tested automatically. It searches, inter alia, for deprecated features, ambiguous links, graphical elements lacking descriptive elements, unlabelled form elements, and features that can only be navigated with a mouse.

Deprecated features are HTML statements that the W3C recommends avoiding and which may be dropped from future versions of HTML. Some features are deprecated specifically because they do not support accessibility or more current HTML functions.

Ambiguous links are multiple links that have the same text but point to different destinations. Screen reader users may not be able to differentiate such links. Similarly, graphical elements that lack descriptive text or proper labelling may be missed or rendered meaningless for them. Last but not least, features that require a mouse place users with different dexterity abilities and levels at a disadvantage.

The e-accessibility checker found that 98 per cent of the national web pages assessed across the

**National sites per type of accessibility barriers**

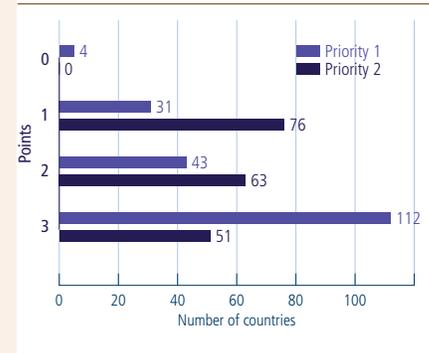


193 Member States had deprecated features, 74 per cent had ambiguous links, 63 per cent had graphical elements lacking descriptive text, 48 per cent had unlabelled form elements, and 35 per cent had features that could only be used with a mouse. The WCAG classifies requirements into priority 1 and priority 2. Priority 1 requirements must be met to comply with the WCAG. Priority 2 requirements should be met.<sup>22</sup> To put it differently, failure to meet priority 1 requirements renders a site “impossible” to access for some users. Failure to meet priority 2 requirements imposes “significant barriers” to access.

Depending on how many tests a website passed for priority 1 requirements, it was assigned from 0 to 3 points for priority 1, with higher numbers representing a higher

proportion of tests passed. Similarly, for priority 2, each website was assigned from zero to three points. The chart below shows how points were distributed among countries.

**E-accessibility points distribution**



As can be seen below, 112 countries’ sites (58 per cent) scored 3 points on the priority 1 test, while only 51 countries’ sites (26 per cent) scored 3 points on the priority 2 test. Conversely, only 31 countries’ sites (16 per cent) scored only 1 point for priority 1, while 76 countries’ sites (39 per cent) scored 1 point for priority 2. While countries are more successful at complying with the priority 1 than with the priority 2 requirements, one implication of this is that there is considerable room for improvement in rendering e-government services available to persons with disabilities.<sup>23</sup> ◆

When it comes to serving populations with different visual abilities through the ICTs, it is not just Europe that carries the torch of innovation. Other countries from several regions of the world also offer services to read their government websites aloud via a speaker or headphones. Among them are Bahrain, Oman and the United Arab Emirates in Western Asia, Japan in East Asia, Malaysia in Southeastern Asia, and Chile in South America.

The Caribbean stands out in Latin America. Although the region as a whole is only in 3<sup>rd</sup> place,

after Europe and Asia, 3 out of the 8 Latin American countries whose national websites have built-in mechanisms that enable the configuration of visual site characteristics come from the Caribbean. The forerunners are the Bahamas, Saint Vincent and the Grenadines, and Trinidad and Tobago.

Although these digital ability statistics point to an infancy stage at best, there is cause for hope. For instance, a promising 32 per cent of governments across the globe (61 Member States out of a total of 193) have already incorporated features that allow

for the configuration of font size, font type, font colour and background colour into the design of their national websites. These advances facilitate the digital access, not only of those with different visual abilities, but also of the elderly.

The findings also point to an overall lack of structured national plans for the digital inclusion of persons with disabilities. As certain countries are taking initiatives to make Internet access a legal right,<sup>24</sup> planning and implementing structured digital inclusion programmes take on increased significance. The European Union’s Web Accessibility Initiative (WAI) guidelines for public websites and universal design for e-accessibility are good starters. But there is a need to focus more on implementation.<sup>25</sup>

### 5.1.3 Gender and income

Regarding the gender dimension or the gender digital divide, women have been unreservedly associated with low Internet use and an overall disinterest in technology. They are underrepresented in their ownership and use of computers and mobile phones, and access the Internet less frequently than men even though once in the labour force, women tend to use the Internet more than men.<sup>26</sup>

The rising social media and networking tools show some promising gender trends. Women demonstrate higher levels of engagement with social networking sites than men. Although they account for 47.9 per cent of total visitors to the social networking sites, they consume 57 per cent of pages and spend significantly more time doing it: about five and a half hours per month compared to men’s four hours.<sup>27</sup>

Table 5.3 shows that the most active women in social media are in Latin America, followed by North America and Europe. Women in Asia are relatively less interested in social media. In all regions, women are engaged more fully in social media than men.

Perspectives on the gender digital divide are provided by the E-Government Survey’s data on countries that devote specific sections to vulnerable groups on their national websites. Figure 5.6 pictures the 55 countries that do so and categorizes them according to their female economic activity. All 55 of them, clustered into five regions, display

**Table 5.3 Access of females versus males to social media<sup>28</sup>**

Social Networking Category Reach by Worldwide Region for Females and Males, May 2010.  
Total audience, age 15+ – Home & Work Locations\*  
Source: comScore Media Metrix

	Social networking % reach by region	
	Females %	Males %
Worldwide	75.8	69.7
Latin America	94.1	91.9
North America	91.0	87.5
Europe	85.6	80.6
Asia Pacific	54.9	50.7

\*Excludes visitation from public computers such as Internet cafes or access from mobile phones or PDAs.

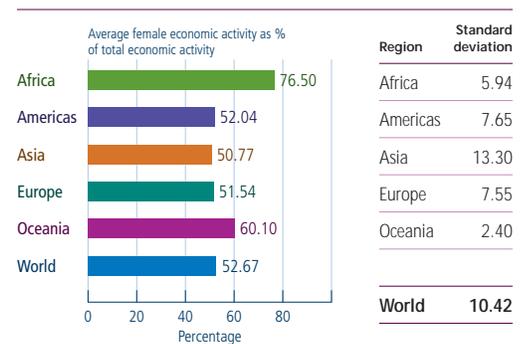
uniform levels of female economic activity<sup>29</sup> hovering around 50 per cent, which is very close to the world average.

The within-region distribution of these countries with regard to female economic activity also follows similarly uniform patterns with low degrees of standard deviation from their respective regional means. Thus, in the sample of 55 countries whose national websites mention vulnerable groups, there are not too many deviating countries within regions with respect to the ratios of women undertaking economic activities.<sup>30</sup>

Regarding the income dimension or the economic digital divide, research and experience have already shown that the poor – individuals,

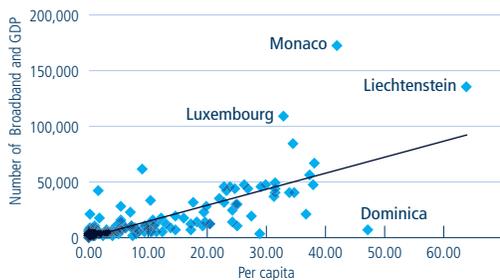
**Figure 5.6 Female economic activity**

Levels of economic activity carried out by women in countries that mention vulnerable groups in their national websites



communities or nations – lack adequate access to ICT tools, including the Internet<sup>31</sup> and more recently to the faster and more convenient broadband technology.<sup>32</sup> The income gap is usually exacerbated by low levels of education, difficult access to technological and other amenities because of location in remote areas, and sometimes additional disabilities hampering the development of ICT skills.<sup>33</sup> Income is thus a factor, but not the only one in shaping the digital divide.

**Figure 5.7 Broadband (2012) and GDP per capita (2010 or the latest figure)**



**Source:** ITU data used in the E-Government Survey Data (2012) for broadband (2011 values) and GDP/Capita (current US\$, 2010) from World Bank (2012) found at (<http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>). The following countries' broadband per 100 inhabitants is zero or very close to zero (<0.08): Afghanistan, Burundi, Cameroon, Chad, Congo, Eritrea, Ethiopia, Guinea, Guinea-Bissau, Iran (Islamic Republic of), Liberia, United Republic of Tanzania, and Zambia.

The emerging economies in the developing world are catching up fast. Internet users in developing countries increased from 44 per cent of the world's population in 2006 to 62 per cent in 2011. And 37 and 10 per cent of these users are in China and India, respectively.<sup>34</sup> The increasing income levels paralleled with the increasing take-up of ICTs in general underline once more the importance of infrastructure and access, including affordability in the digital divide.

A glance at the group of countries offering built-in, sophisticated software service for reading content aloud via a speaker or headphones shows that they are indeed all upper-middle or high-income countries.<sup>35</sup> Yet there are still considerable differences in the GDP/per capita levels of even this small cluster of twelve rich countries. The range stretches from the least rich, Malaysia (US\$8,373) to the richest, Luxembourg (US\$108,921).<sup>36</sup>

Expanding the income perspective from a simple GDP/per capita to the more comprehensive Human Development Index (HDI) yields similar results: Countries must be above a certain threshold of socioeconomic development to begin addressing the higher-end needs of their vulnerable populations, here between the HDI levels of 0.705 (Oman) and 0.943 (Norway).<sup>37</sup>

As simpler solutions for digital inclusion are explored, more countries from the lower income groups join the group of countries that address the needs of their citizens with different visual abilities. This is the case of the 60 countries whose national government websites allow changes in font size, font type, font colour and background colour. This number is a good contrast to the only seven and twelve countries that respectively offered more costly technological solutions to the visual and hearing needs of persons with disabilities. The ranges of GDP per capita and HDI levels in this larger and more diverse group are from Ethiopia (US\$358.25) to Liechtenstein (US\$134,914.67), and from Mozambique (0.322) to Norway (0.943), respectively.

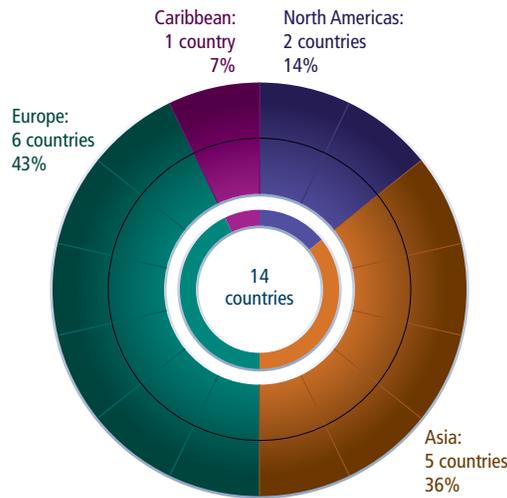
One new development with the potential to counter the economic digital divide is what the International Telecommunications Union calls the “mobile miracle.”<sup>38</sup> Putting connectivity and ICT services within reach of the vulnerable populations, least developed countries have seen their mobile data connectivity jump from a meagre 1.2 per cent of their population to 30 per cent in the last 10 years. Among the developing regions, Africa has the highest mobile growth rate. Mobile penetration has risen from just one in 50 people to over one quarter of the population there in the last decade.<sup>39</sup>

These trends in mobile connectivity are not just technology enhancements. They are used by governments to bring public services to their citizens, such as safe drinking water, healthcare services, online education, all provided through m-government. The 2012 United Nations E-Government Survey shows some convergence between those governments that are relatively advanced in m-government and those that have taken steps to integrate vulnerable groups.

Out of a total of 25 Member States that offer separate m-government sites, 14 also include specific sections on their national websites for vulnerable groups such as the poor, illiterate, blind, old, young, and women.

**Figure 5.8 M-government and vulnerable groups**

Countries that offer both a separate m-government and references to vulnerable groups on their national websites



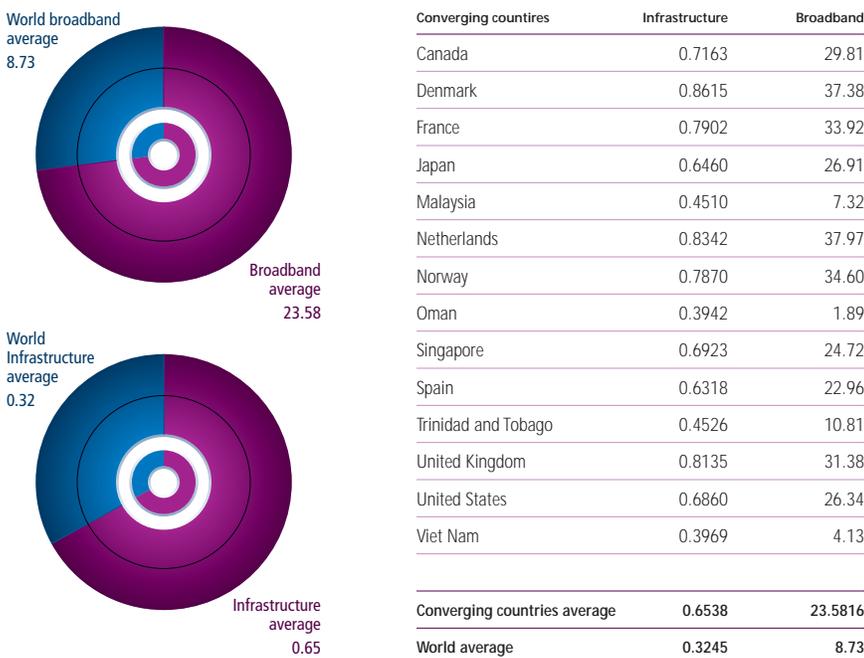
These countries are: Canada, Denmark, France, Japan, Malaysia, the Netherlands, Norway, Oman, Singapore, Spain, Trinidad and Tobago, the United Kingdom, the United States, and Viet Nam. From a regional perspective, Europe and Asia are again leaders, followed by North America and the Caribbean.

Relating the digital inclusion and m-government convergence to broadband and infrastructure data can yield interesting insights. The average broadband and infrastructure ratios of the converging countries over the respective world averages are high. Their infrastructure scores average about 49.6 per cent higher than the world average, and their broadband score averages about 37 per cent higher than the corresponding world average. These findings, illustrated in figure 9, point once more to the important factor of infrastructure and increased access through e- and m-government.

M-government is contributing to bridging the digital divide but is not a complete or sufficient answer per se. Access to a cell or a mobile phone is not the same thing as creating and managing one's own business or community, which a networked computer allows. Multichannel service delivery and m-government coupled with the right e-government strategies can together expand access and alleviate the challenges faced by the vulnerable groups.

**Figure 5.9 Broadband, m-government, and vulnerable groups**

Average broadband and infrastructure ratios of countries that both specify vulnerable groups in their national websites and offer a separate m-government portal



### 5.1.4 Location and age

The income gap in ICT penetration and take-up parallels other parameters of digital exclusion. One of them is the rural/urban divide or the spatial digital divide. Most of the world's poor live in rural areas, and most of the world's rural populations tend to be poor. There are still about 1.4 billion people living on less than US\$1.25 a day, and close to 1 billion people suffering from hunger. At least 70 per cent of them are rural.<sup>40</sup>

In the spatial digital divide, sectoral perspectives are particularly important. E/m-health and e/m-education in remote areas and distant markets with low population densities are more than technology upgrades. They can be effective tools in promoting sustainable development through increased access and community-oriented services that actively involve all segments of society in the formulation, design and provision of needed e-services.

The digital divide is also an age issue. Today, 45 per cent of Internet users worldwide are below the age of 25. This is equal to over one billion young women and men. Yet that leaves two billion young potential users still offline.<sup>41</sup> Considering the dexterity of youth in adapting to change and their propensity to innovation, they constitute a not-to-be-missed opportunity for policy makers whose aim is to build long-term digital literacy.

Connecting schools to the Internet and connecting them with each other via ICT tools are important means for getting youth on board. As the International Labour Organization warns of a global youth employment crisis, IT-based inclusion initiatives become even more critical.<sup>42</sup>

The elderly can also benefit from Internet training and access programmes. In their case, fighting computer anxiety and raising awareness of the benefits of usage are important. In general, medical information, tips on stretching a limited income, expansion of social support networks, and staying in touch with family<sup>43</sup> are among the advantages that senior citizens can seize to improve their well-being and help close the digital divide.

Online social activity is highest for teens and young adults. Currently, about 72 per cent of young adults and teens use social networking sites, compared to 40 per cent of adults age 30 and older. But even though social networking sites are still dominated by younger users, increasing trends showing more use by the elderly are promising. Lately, social media have been important tools for empowering older people. According to the Pew Research Center, the 74-plus demographic is the fastest growing user group of social networks and social networking among Internet users ages 65 and older grew 100 per cent between April 2009 and May 2010, jumping from 13 to 26 per cent.

## 5.2 Conclusions and policy recommendations

At the end of the day, social phenomena that can be advanced through the right economic models, political decisions and social policies include issues in sustainable development such as energy access and

### Box 5.3 Selected examples of initiatives in support of access/use

Country	Initiatives
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<b>Denmark:</b>	<b>Robobralle</b>
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- E-mail-based translation of documents to synthetic speech allowing the blind to access otherwise unreachable information.
- Free-of-charge to all non-commercial users and available in 7 European languages.
- In the process of being validated in Ireland, Cyprus, Italy, Portugal and the United Kingdom.



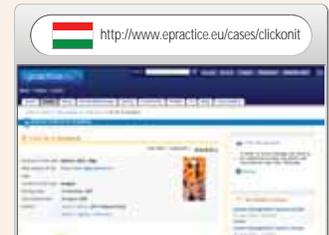
<b>Rwanda:</b>	<b>TracNet</b>
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- National phone and Internet-based reporting system for HIV/AIDS supporting the work of TRAC – Treatment and Research AIDS Centres.
- TRACs provide technical assistance and guidance for the effective organization and management of HIV/AIDS programmes



<b>Hungary:</b>	<b>Click On It Grandma</b>
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- Computer classes offered to senior and retired citizens at nominal fees (EUR 4) in nationwide community centres.



efficiency, food security and sustainable agriculture; sound water management and healthy oceans; balanced urbanization; improved resilience; and disaster management. Likewise, myriad dimensions of the digital divide, including the spread, density, use and applications of information and communication technologies are social in their construct for they often overlap with the existing socioeconomic inequalities in societies.<sup>44</sup> In fact, even technology itself is social because it is shaped by human action and applied in social contexts – not in a vacuum.<sup>45</sup>

The social nexus between the digital divide and sustainable development evokes the necessity for scholars and policy makers to consider ways of feeding one into the other in order to address the challenges facing both. For instance, if by bridging the gender digital divide, structural gender inequality can be reduced, then policy makers would have achieved two aims with a single effort.

Transforming the digital divide into digital dividends for development for the people necessitates

a direct and targeted focus on vulnerable groups by e-government. Such a focus repudiates one-sided or piecemeal e-government policy-making. As also corroborated by the evidence presented in chapter 5 on usage and user needs, it requires comprehensive and hybrid approaches with integrative, multi-stakeholder and multichannel implementation frameworks.

The digital divide in e-government can best be addressed through multiple dimensions. Below is a short summary of these and associated policy recommendations:

- Access to ICTs holds educational advantages, prospects for future employment and earnings, opportunities for social and civic involvement, and potentials for increases in civic equity. The ICT advantage can be multiplied through policies targeting vulnerable groups. This implies consideration of linking e-government strategies with sustainable development policies.
- The United Nations E-Government Survey shows that governments of the world are only starting to include their vulnerable groups digitally. Such inclusion initiatives should be enhanced and spread to all levels, eventually including the local level.
- Many factors are important for overcoming the digital divide: adequate financial resources, commitment by the top leadership, a national ICT workforce, open competitive and transparent economic and political environments, education, technology transfers, and innovation. Two particularly essential issues are infrastructure and access, both within the framework of efficient, effective and citizen-centric e-government. Two related issues of importance here are broadband and m-government.
  - Broadband involves the effective use of the speed and connectivity advantages offered by technology and putting them at the service of sustainable development initiatives.
  - M-government is instrumental in increasing access to and effective use of ICTs and e-government services but hardly provides a complete answer to the digital divide. Access to a cell or a mobile phone is not the same thing as creating and managing one's own business or community, for which

a networked computer is essential. Yet, m-government is crucial in expanding the number of users and diversifying the channels for service delivery, particularly in the public sector, as documented in chapter 6.

- Three salient ICT issues specific to vulnerable groups are:
  - Indirect benefits of ICTs through intermediaries such as traditional media channels, which can access the Internet while vulnerable groups cannot;
  - The rise of social media with their more inclusive tendencies and lower technical skill requirements, which are opening up new horizons for the inclusion of vulnerable groups; and
  - The emergence of cell-only wireless users within the vulnerable groups.

All three must be on the radar screens of governments – in terms of the right infrastructure, adequate training, effective regulation and inclusive policy making.

- New skills are gaining importance. Among them are fast retrieval of information; threading between legitimate and illegitimate sources; assessing usefulness, validity and relevance of data; and use of social media and multimedia. New skills create a new type of social capital.
- The new skills and the new social capital being created are very much associated with the rising influence of online social media. Social media include and engage more diverse social groups into policy making. The lower technical know-how required to tap into these media can be an advantage for the vulnerable groups. They can be employed in the new government organizations created to manage e-participation. Prospective data analysts can be recruited from amongst the vulnerable populations.
- Connecting schools to the Internet and connecting them with each other via ICT tools are important in getting youth on board. Fighting computer anxiety is more important in the case of the elderly. Developing e-learning and suitable ICT contents for target populations is key. The right infrastructure and technology can support this process. A good example is a

device called “Simputer,” which is simple and can be used by the illiterate.<sup>46</sup>

- Education and training in ICTs for persons with disabilities are important but not the only remedies. Often times, simple technical tweaks can be useful: adding labelling to images on the web so that screen readers can find them, or providing audio Captchas for those with different visual abilities, including the elderly.<sup>47</sup>

The digital divide is no longer confined to counting telephone lines or cellular subscriptions per 100 inhabitants. It is about who has the skills and the

means to access information, and then uses it to create new content and engage with other citizens to better respond to their needs and aspirations. For this kind of divide to be bridged, strong economies and healthy governance systems need to encompass a direct and targeted focus on vulnerable groups, including the specific disadvantages that they face and the unique contributions that they can make in bridging the digital divide. E-government should take into account the panoply of abilities of citizens to effectively address this issue with an eye on supporting sustainable development for the people. 