ICT4D and Global Connectivity

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Global connectivity refers to the connection of persons, organizations, and communities in one part of the world with other persons, organizations, and communities in other (distant) parts of the globe using the latest communication technologies. The technologies used to achieve this connectivity are ever changing and include satellite systems and undersea fiber cable systems. When these developments are coupled with the aims of ICT4D (information and communication technologies for development), the implication is that there will be positive developmental impacts from global connectivity. However, global connectivity, as an ICT tool, may have both positive and negative developmental impacts.

Over the years, especially in the recent past, there has been a scramble toward global connectivity in many economically developing countries, with varying developmental impacts. Global connectivity can be found in most countries' ICT or national development policies and plans. Most of these planning documents adopt supplier perspectives. The widespread belief is that global connectivity is a critical infrastructure for development. For example, the growth of undersea fiber cables that provide global connectivity in African coastal waters has been substantial. East Africa, which relied exclusively on satellites for international connectivity for many years, has, since 2009, witnessed increased projected investment in international cables, including, for example, SEACOM (Africa cable system, connecting south and east Africa), EASSy (linking the eastern and southern half of Africa), TEAMS (The East Africa Marine System, linking Kenya with the United Arab Emirates) and LION (connecting Madagascar with Mauritius and other islands in the Indian ocean) (Graham & Mann, 2013; Waema, Adeya, & Ndung'u, 2010).

Undersea cables have transformed global connectivity, resulting in the reduced wholesale cost of broadband as a result of incentives to migrate from satellite to fiber. In Kenya, for example, most operators have migrated from costly satellite to fiber for their international connectivity (CCK, 2012; Gwaro et al., 2013). The average satellite bandwidth cost was about US$3000 – 4000 per Mb/s per month before the undersea cables arrived. This had dropped to about US$400 – 500 per Mb/s per month by 2010 (Waema, Adeya, & Ndung'u, 2010). Despite the reduction in broadband wholesale prices, there has not been a commensurate reduction in retail bandwidth prices, although users now have access to faster broadband services (CCK, 2012). An edited collection of papers by Burnett, Beckman, and Davenport (2013) provides an overview of law and legislation, which, though rather technical, covers undersea cable, including coverage of regions in the global South.

There are different definitions of broadband from a speed perspective. Table 1 shows the broadband definitions of selected countries in Africa, Asia, and Latin America (GoK, 2013). In Africa, less than 10% of fixed (wired) broadband subscriptions offer speeds of at least 2 Mb/s. This is also the case in several countries in Asia and the Pacific, the Americas, and some Arab States (ITU, 2013). However, Table 1 illustrates that many countries in the global South are dramatically increasing the speed of broadband connectivity and the picture is changing very rapidly, especially in Africa, which has witnessed a boom in connectivity not only as a result of the growth in undersea cable infrastructure, but also the expansion of the mobile phone infrastructure (Williams, Mayer, & Minges, 2011).

The International Telecommunication Union (ITU) estimates that in 2013, more than 2.7 billion people were using the internet, which corresponds to 39% of the world's population. In the lower income countries, 31% of the population was online, as compared with 77% in the wealthy countries (ITU, 2013). Despite these high and growing levels of connectivity, however,

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Table 1 Broadband definitions in selected countries in Africa, Asia, and Latin America

Country	*Broadband target*	*Year*	*Av. Peak Q1/2012*
AFRICA			
Egypt	75% households access 2 Mb/s	2015	7.6 Mb/s
	90% households access 25 Mb/s	2021	
South Africa	Universal access to broadband services (download speeds of at least 256 Kb/s)	2019	6.1 Mb/s
Kenya	Minimum of 40 Mb/s in urban areas	2017	Not available (but broadband defined as min. 256 Kb/s)
	Minimum of 5 Mb/s in rural areas	2017	
ASIA			
South Korea	Minimum of 10 Mb/s and maximum of 1 Gb/s	2012	47.8 Mb/s
Malaysia	50% of households to access 2 Mb/s	2020	15.4 Mb/s
India	2 Mb/s	2012	6.9 Mb/s
	4 Mb/s	2014	
LATIN AMERICA			
Argentina	10 Mb/s to all	2015	14.4 Mb/s
Brazil	1 Mb/s to all	2014	15.1 Mb/s
Chile	70% broadband penetration to all households	2014	19.7 Mb/s

Source: Adapted from GoK (2013)

the developmental impacts are often difficult to discern or assess.

Developmental impacts are often considered from a supply-side perspective on global connectivity. In Kenya, for example, the national broadband strategy, similar to those in place in many developed and developing economies, suggests that the benefits of improved national and global broadband connectivity include enhanced economic growth and employment, increased investment in business process outsourcing and ICT-enabled services, enhanced national competitiveness through improvements in backward and forward economic linkages, better e-government services, and universal accessibility to broadband facilities and services (GoK, 2013). However, these benefits are not always evident in improved distribution of economic resources even when they are associated with gains in economic growth.

Asia is witnessing a proliferation of connected mobile devices, with potential developmental impacts. One report estimates that by 2017, 1.5 billion new mobile connections will have been added, "fuelling the growth of the so-called 'Connected Life' by intelligently connecting people to everything around them via new and innovative mobile-connected products and services" (PwC, 2013, p. 3). It is estimated that Asia will be the most connected region by 2020, with far-reaching social and economic potential impacts, including:

- US$22 billion in economic productivity gains in China by reducing traffic congestion;
- helping to make power available to 10 million homes in India by cutting power theft;
- US$10 billion in savings on health care costs in Japan through m-health;
- reduced education costs for students in South Korea by up to US$12,000 per student.

In addition to supply-side impacts, the expansion of global connectivity also has demand-side implications for access to and use of digital services by individuals, households, and businesses and other organizations. The key drivers of the demand-side are linked to the fact that investment often has to compete with other priorities. At the individual and household levels in many countries with few economic resources, access to global connectivity competes with other basic facilities and services, including food, housing, clothing, transport, and so on. Access is also limited by national broadband infrastructure availability, especially in marginal rural areas in many poor countries, as well as by the capabilities of people and communities to effectively use and benefit from available services due to limitations in levels of education and training. More often than not, there is a mismatch between the supply of and demand for global connectivity. Research is therefore needed to establish whether improved access is leading to improved quality of life as a result of increasing capacities to effectively exploit connectivity when it becomes available at affordable prices.

Although several studies have found a correlation between internet penetration and GDP – for example, Amiri and Reif (2013) in research focused on Nordic countries – we argue that further research is still required to isolate the effects of other factors that affect GDP. Another study, by Mupela and Szirmai (2012), examines the relationship between the costs of international fixed line calling and the cost of broadband, finding them to be negatively associated with the intensity of exports from countries of origin, noting that efforts to reduce the costs of both should have a positive impact on exports from the sub-Saharan countries they study. They also note that further research is needed.

In conclusion, the relationship between ICT4D and global connectivity holds great promise for countries that are industrializing and developing economically. There are opportunities for the socioeconomic development of individuals, households, and businesses, as well as for contributions to the economic prosperity of communities and countries. It is essential, however, to achieve a balance between the supply of connectivity and the strengthening of demand during the planning and implementation of improved connectivity. This applies at the national, business, and community levels. Typical bottlenecks, such as access to and availability of broadband services, the affordability of broadband services in relation to income levels, and the need to strengthen capacities to effectively exploit the broadband infrastructure – and a number of other preconditions – need to be addressed before global connectivity can achieve the projected positive impacts and become sustainable.

The preconditions mentioned in the previous paragraph include enabling national policy and legal and regulatory frameworks (Calandro & Moyo, 2012), shared perspectives on how the infrastructure can be exploited, and shared trust in the technology and services it supports. A move away from measuring the mere presence of, or access to, global connectivity could lead to a consideration of ways to use this connectivity to create opportunities that may lead to the enhancement of social, economic, political, and cultural development opportunities for communities, businesses, households, and individuals, thereby contributing to positive developmental impacts and sustainability.

It is, however, important to acknowledge that broadband connectivity, and by extension global connectivity, can have negative impacts. Initially, for example, it can have negative effects on employment opportunities by enabling certain business functions to take place remotely through outsourcing; or it can lead to an initial negative growth on employment due to productivity increase associated with broadband connectivity and related technologies (ITU, 2012). In addition, global connectivity often leads to increased global competition for domestically produced goods and services, which may slow down the growth of domestic industries. From a social perspective, global connectivity can also have all manner of negative effects on domestic cultural practices as a result of exposure to foreign media and information.

SEE ALSO: Digital Divide(s); ICT4D and Economic Development; ICT4D and Local Access; ICT4D and Mobile Communication; ICT4D and Poverty Reduction; ICT4D, Regulation and Strategy

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