

### III. Sri Lanka's Information Infrastructure

**In today's knowledge-based world, information and communication technology (ICT) plays an increasingly central role in economic growth and productivity.** Recent evidence has shown that an increase of 10 mobile phones per 100 people can boost GDP growth by 0.6% and a 1% increase in the number in the number of internet users can increase total exports by 4.3%.<sup>7</sup> Rapid advances in information infrastructure are dramatically affecting the acquisition, creation, dissemination, and use of knowledge, which in turn affects economic and social activities, including how manufacturers, service providers, and governments are organized and how they perform their functions. To develop a strong information infrastructure, it is necessary to mobilize the many stakeholders that are involved in its deployment and use: the telecommunications networks, strategic information systems, policy and legal frameworks affecting their deployment, as well as skilled human resources needed to use and develop it.

**Sri Lanka has an opportunity to experience substantial and rapid growth with an emerging Business Processes Offshoring (BPO) sector.** Over the last few years, many companies have become increasingly interested in setting up operations throughout the country in various fields including accounting, medical insurance, legal work, banking, call centers and others. This sector has already shown immense potential to produce jobs and growth. However, the supply of physical infrastructure and human resources, rather than demand, seems to be the ongoing challenges confronting the BPO industry. Sri Lanka's poor infrastructure has been cited by many BPOs as being a major bottleneck to growth, leading potential investors to look to neighbouring countries like Singapore and Malaysia for more dependable services.

**Experience shows that a competitive ICT sector is a prerequisite for improving information infrastructures.** Creating a competitive environment is one of the defining factors in the country's ability to embrace the knowledge economy. Improving the country's telecom infrastructure will not only help increase ICT literacy levels, but it will also support sustained economic growth.

**The e-Sri Lanka initiative is an excellent step in the right direction.** A key government initiative to reap the benefits of ICT while raising living standards and pursuing the MDGs, has been the e-Sri Lanka program which commenced early in 2003. It intends not only to use ICT to develop the economy and alleviate poverty, but also to extend the benefits of ICT to impoverished regions by inspiring and implementing a number of initiatives. These attempts are primarily in developing e-government solutions, creating adequate human resources for ICT, building a dependable information infrastructure, and exploring global market opportunities for local software.<sup>8</sup> Enabling e-Sri Lanka to bring connectivity to people in underdeveloped regions throughout the country will be a huge step in connectivity, ICT development, and in Sri Lanka's quest to embrace the knowledge economy.

### Benchmarking Sri Lanka's Information Infrastructure

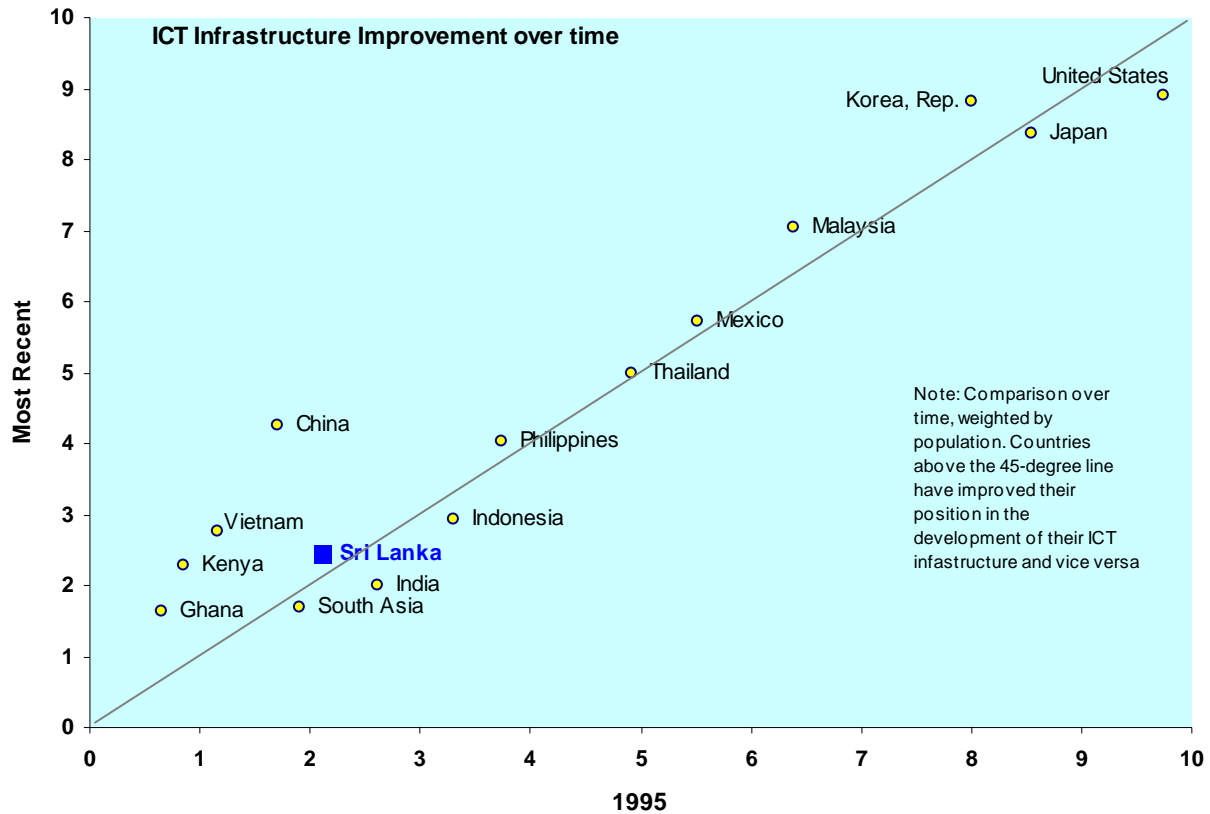
**Although Sri Lanka has seen slight improvements in its ICT development over time, the country will need to develop at a faster pace in order to take advantage of the knowledge economy.** Figure 9, indicates that other countries such as China, Malaysia, and Korea have made significant leaps in the development of their information infrastructures and have done so at faster pace. These countries are already enjoying the benefits of rapid growth brought about by investing efforts in developing their respective telecom infrastructures. The spread of ICT in Sri Lanka is occurring at a slow pace, and will need to be increased if the country wants to benefit rapidly from the knowledge economy

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<sup>7</sup> [www.nationamedia.com](http://www.nationamedia.com) "World Bank to fund ICT Bureaux in Kenya", 8<sup>th</sup> February 2007

<sup>8</sup> World Bank, 2006e

**Figure 9: Sri Lanka has made great strides in ICT improvement**

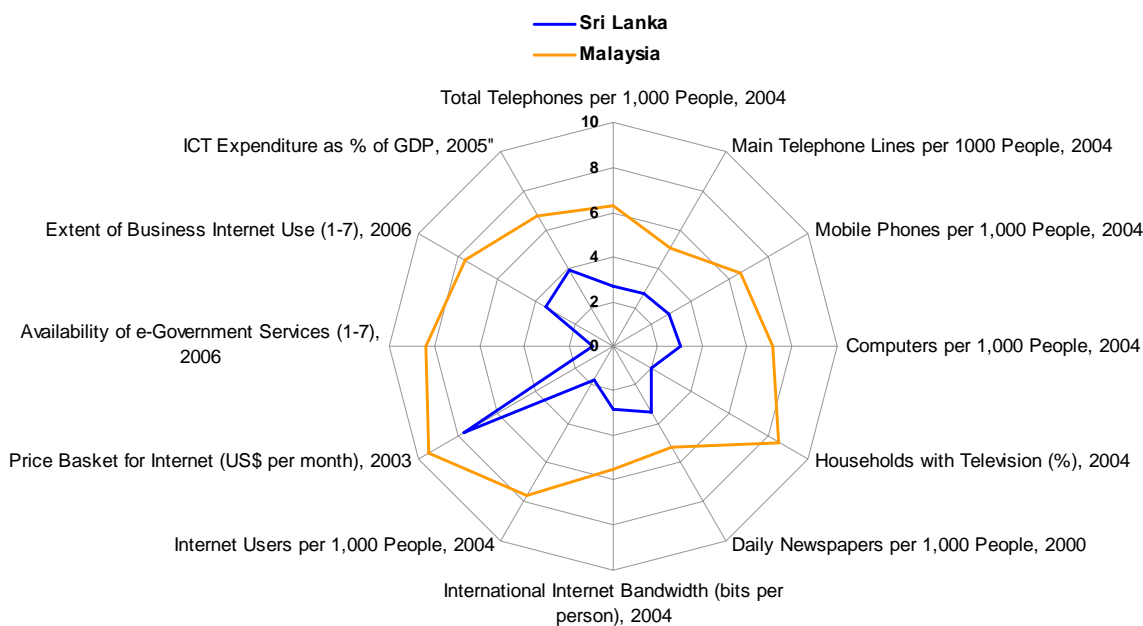


Source: World Bank Knowledge Assessment Methodology, [www.worldbank.org/kam](http://www.worldbank.org/kam)

**Sri Lanka needs to strengthen all aspects of its information infrastructure.** Sri Lanka’s ICT scorecard sheds light on areas desperately in need of improvement within the country’s information infrastructure (Figure 10). Within all categories, benchmarked against Malaysia and other comparator countries, Sri Lanka scores in the bottom half in almost every category. Although Sri Lanka has made advances in IT infrastructure over time, significantly increasing connectivity and dependability, the country will need to strengthen this sector further in order to transform itself into a knowledge based economy.

**High connectivity prices are the most significant impediment to telecom penetration on the island.** The price for internet connectivity in Sri Lanka in 2004 was almost twice as much as the price in India, and more expensive than those in China, Malaysia, Thailand and Philippines. These high prices can be attributed to limited competition among service providers within the telecom industry and the weak regulatory body governing it. Sri Lanka’s high prices limit access to connectivity and restrict IT literacy. The amount of internet users per 1,000 people was 14.40 within Sri Lanka, significantly lower than all of its comparator countries. Although Sri Lanka’s mobile phone industry has grown immensely, bringing mobile connectivity to a large number of people, the amount of mobile phones per 1,000 people is still fairly low at 164.90, with only India and Vietnam showing lower figures.

**Figure 10: Sri Lanka's ICT Infrastructure lags behind Malaysia's**



Source: World Bank Knowledge Assessment Methodology, [www.worldbank.org/kam](http://www.worldbank.org/kam)

### Global Rankings

**The Sri Lankan population is not yet prepared to benefit from developments in ICT.** The World Economic Forum's Global Information Technology Report of 2005-2006 highlights its Networked Readiness Index (NRI) of 115 countries. The NRI is defined as the degree of preparedness of a nation or community to participate in and benefit from ICT developments and is composed of three indices, which assess the following: environment for ICT offered by a given country or community, readiness of the community's key stakeholders (individuals, businesses, and governments), and usage of ICT among these stakeholders.<sup>9</sup> Sri Lanka ranks 83<sup>rd</sup> behind all of its comparator countries: Malaysia with the highest ranking at 24, Thailand 34, India 40, China 50, Mexico 55, Philippines 70, and Vietnam at 75.

**Sri Lanka still has some way to go to create an enabling culture that promotes IT literacy and the use of ICT.** The Economic Intelligence Unit's 2005 E-readiness report is essentially a measure of a country's business environment, a collection of factors that indicate how amenable a market is to Internet-based opportunities. E-readiness is not simply a matter of the number of computer servers, websites and mobile phones in the country (although these naturally form a core component of the rankings), but also such things as a citizen's ability to utilize technology skillfully, the transparency of its business and legal systems, and the extent to which governments encourage the use of digital technologies.<sup>10</sup> Sri Lanka occupies the 56<sup>th</sup> spot, just behind India and China at 49 and 54, respectively. This index demonstrates that the Sri Lankan population has a generally low computer literacy rate. Increased grass roots awareness and ICT literacy is now being promoted by government, most notably through the e-Sri Lanka initiative and it is expected that these rates will improve in the near future.

**The partial privatization of Sri Lanka Telecom (SLT) led to a greater level of penetration of both fixed line and mobile phones.** In 1997, government divested 35 percent of its stake in SLT to Nippon Telegraph and Telephone Corporation (NTT) of Japan and assigned the company management control. A

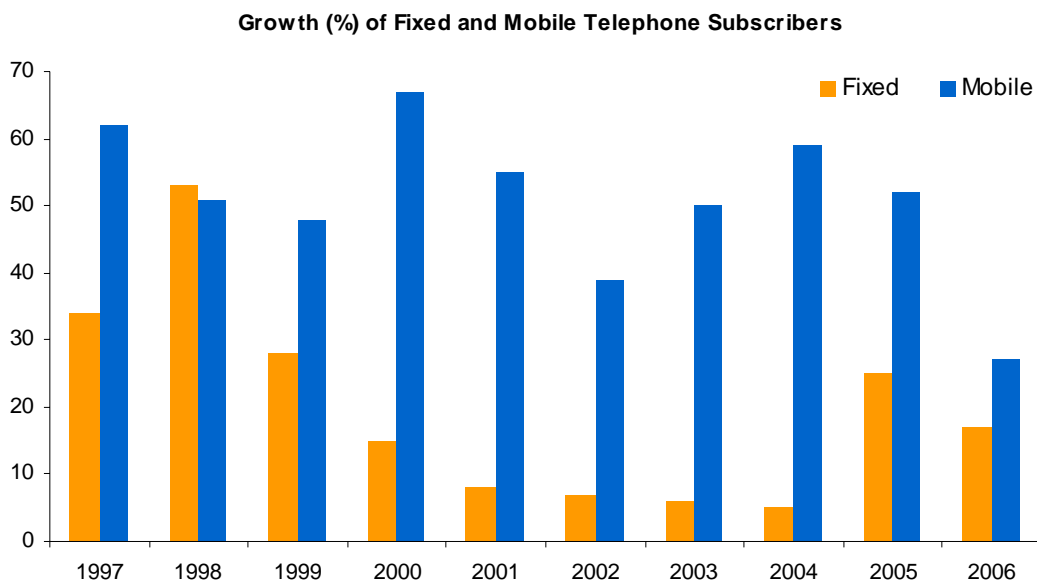
<sup>9</sup> World Economic Forum, 2005b

<sup>10</sup> Economic Intelligence Unit, 2005

further 3.5 percent of SLT's shares were given to its employees. In December of 2004, the government gave another 12 percent of its stake at an initial public offering, leaving it with 49.5 percent. When partial privatization happened in 1997, the government made the decision not to issue any new licenses, to vest monopoly power in SLT for international voice service operations, and to grant permission for annual tariff increases for domestic services of 25%, 25%, 20%, 15%, and 15% by SLT until 2002.<sup>11</sup>

The figure below shows that following the privatization of SLT in 1997, the growth rate of fixed line subscribers increased substantially (Figure 2-3). However, due to market saturation and increased prices, subscriber growth steadily declined and it was not until the introduction of Code Division Multiple Access (CDMA) in 2005 that the fixed line sector experienced major growth. The mobile phone market also became heavily saturated in 2004, leading to sharp declines in subscriber growth in recent years. However, the mobile market segment grew significantly, at an average rate of 54.5 percent from 1994 to 2004. It now accounts for 60 percent and rising of the total phone market.

**Figure 11: Sri Lanka's telecoms have taken-off in recent years**



*Source: Telecommunications Regulatory Commission of Sri Lanka, "Financial Analysis of the Telecom Sector"*

**Although increased competition is present in the mobile phone market, the fixed line market is far from competitive, supplying customers with high prices and long waiting lists.** The Sri Lankan mobile phone market is characterized by affordable initial price via prepaid systems, constant improvements in technology, quick supply, rapid expansion of coverage, and a declining number of public payphones. However, in the fixed line market, operators have traditionally concentrated on high volume clients in densely populated areas and until recently due to TRC's discriminatory licensing practices limiting these operators to use only WLL technology. The monopoly right of SLT to provide international services after privatization perpetuated exceptionally high international call tariffs. The removal of this monopoly right in August 2002 resulted in a huge reduction in tariffs by more than 50 percent.<sup>12</sup> However, the number of applicants on waiting lists has been experiencing an upward trend, suggesting that supply is still an issue. The use of internet is also significantly low due to the high rate of local call tariffs and high price of computer equipment although the latter has now come down significantly through the government's launch of the e-Sri Lanka PC.

<sup>11</sup> Balasooriya et al. (p. 387)

<sup>12</sup> Balasooriya et al. (p. 388)

**An important regulatory issue revolves around the interconnection regime for other users to access the main incumbent's network in a fair and efficient way.** In Sri Lanka, the TRC's practice in interconnection matters has been only to intervene when operators are unable to come to a settlement. It will be increasingly important for Sri Lanka to reformulate the current regulatory regime for the TRC to remain independent from government, thereby ensuring that the incentives to create a competitive environment in all sectors of telecommunications are enforced. Private investments will also be a significant factor contributing to the development of the ICT sector, knowledge transfer, and future industry opportunities. In a country like Sri Lanka, which is being increasingly recognized as a destination for offshoring activities by foreign investors, the assurance of transparency and consistency from the telecom regulator will be important to build investors' confidence for future investments.

**Increased competition will lead to lower telecom prices that will allow the emerging BPO industry to flourish.** In turn this will lead to increased job opportunities, economic growth and increased standards of living. It is estimated that the offshoring industry could easily grow from its current level, accounting for approximately US\$100 million and 5,000 jobs to becoming a US\$1 billion industry employing up to 100,000 middle and highly skilled professionals within the next 5-10 years.<sup>13</sup>

**Foreign investors are deterred by the country's high telephone costs.** In a study on BPO companies which currently have operations in Sri Lanka found that telecommunications services, although essential in the provision of IT enabled BPO services, were perceived as a major constraint to growth. After human resources, the second highest expense faced by a BPO is telecommunications with costs averaging around 22 percent of total monthly costs. High costs and low penetration of leased line services have been speculated as adversely impacting the expansion of BPO activity. In addition, given that leased line penetration is low outside of the greater Colombo area, BPO businesses are restricted in their ability to expand service centers outside Colombo and thus leverage potentially lower labor costs.<sup>14</sup>

## **Sri Lanka's ICT Infrastructure Achievements and Developments**

### *Technology Development*

**Once privatized, the Sri Lankan telecom sector has introduced new, faster and more efficient technologies.** In the late 1990's Sri Lanka was the first country in South Asia to introduce second generation digital communications systems (2G), such as Global System for Mobile communication (GSM), automatic international roaming, Short Messaging Services (SMS), Wireless Application Protocol mobile internet (WAP) and General Packet Radio Service (GPRS). Since then, operators have introduced new technologies such as dual band and multi Media Messaging Services (MMS).<sup>15</sup> Sri Lanka's telecom sector grew by 32% in 2004, spurred by private sector participation, a rapidly expanding mobile market, new technology and enhanced network coverage.

**Sri Lanka introduced CDMA technology in 2005.** Soon after, the government allocated CDMA spectrum to the three fixed line operators: SLT, Suntel Ltd. and Lanka Bell. The initial roll out of CDMA services has been a success. Lanka Bell, the first to launch CDMA services, added 100,000 new subscribers within the first 8 months.

**Sri Lanka has greatly benefited from access to the Sea-Me-We 4 international fiber optic submarine cable.** The Sea- Me-We 4 was launched on November 22, 2005 and connects South East Asia to European countries through the Indian Subcontinent and Middle East. According to SLT, a shareholder of Sea-Me-We 4, the cable provides access speeds four times higher than that of the current

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<sup>13</sup> Radwan et. al.

<sup>14</sup> Lirneasia, 2006b

<sup>15</sup> American Embassy, Colombo

Sea-Me-We 3 cable. Sri Lanka's largest mobile operator, Dialog Telekom, is also a shareholder of the new cable system through its parent company Telekom Malaysia. In addition, a submarine cable system connecting South India to Colombo is also underway. SLT has signed an agreement with Bharat Sanchar Nigam Ltd (BSNL) of India for this purpose. It will improve connectivity between the two countries and provide BSNL with additional international bandwidth through Sri Lanka. It is estimated that the Sea-Me-We 4 cable system along with satellite connectivity will provide Sri Lanka adequate capacity to meet future demand for international bandwidth.

**SLT is to launch a Wireless Internet (WiMAX) network within the next two years.** WiMAX or Worldwide Interoperability for Microwave Access uses the 3.5 gigahertz frequency band to provide cost effective broadband technologies. The TRC has assigned test frequencies to SLT for a WiMAX project to rollout in Colombo, Kandy, and Galle.

#### **Box 2: The E-Sri Lanka Initiative**

**E-Sri Lanka has been instrumental in providing affordable connectivity to a broader population.**

The Information Communications and Technology Agency (ICTA) was set up in 2003 to function as an apex agency for ICT policy and program implementation in Sri Lanka. One of its most notable achievements has been the establishment of Telecenters (Nenasalas in Sinhala) throughout the country. Nenasalas offer the public access to knowledge and information; internet, email facilities, and e-learning along with training at affordable rates. The program follows a community model in which centers are established in the central location of a village such as a religious institution, public library or community organization. These centers act as a resource to disseminate knowledge, share information and access citizen services through the internet, with the ultimate goal of reducing poverty, peace building, economic and social development and improving the IT literacy of the country.

**The e-Sri Lanka program is also supporting mass IT literacy through the e-Citizen program.** The program offers two recognized ICT qualifications including International Computer Driving License and e-Citizen. The courses are available island-wide through training partners. The preliminary phase intends to target 100,000 citizens in a bid to increase ICT literacy levels which are currently estimated to be at a low of 10 percent. E-Citizen is expected to increase ICT adoption levels, with an additional 400,000 citizens estimated to master basic ICT skills in the next three years with a view to achieving the national target of a 60 percent ICT literacy rate. It will work towards ensuring uniform standards in quality courses for improving ICT literacy. In implementing these programs in an efficient manner, ICTA and the e-Sri Lanka project have created a national presence and heightened awareness of the benefits of ICT. It has also earned an international reputation within the development community world as a pioneering and innovative development agency.

*Source: ICTA Quarterly Newsletter*

#### *Increased competition*

**Sri Lanka plans to expand its mobile phone market to 5 players, in a bid to bring down telephony costs.** On January 18<sup>th</sup> 2007, India's Bharti Airtel Ltd. was licensed as Sri Lanka's fifth mobile phone operator. Bharti has agreed to invest US\$ 100 million within the first year of operation, and will begin commercial operations by 2008, offering 2G and 3G services. Bharti Mittel, Bharti's Chairman said that "the South Asia region offers tremendous growth opportunities and Sri Lanka is a very promising market for telecom services. Bharti Airtel, with its extensive experience and unique business model will strive to

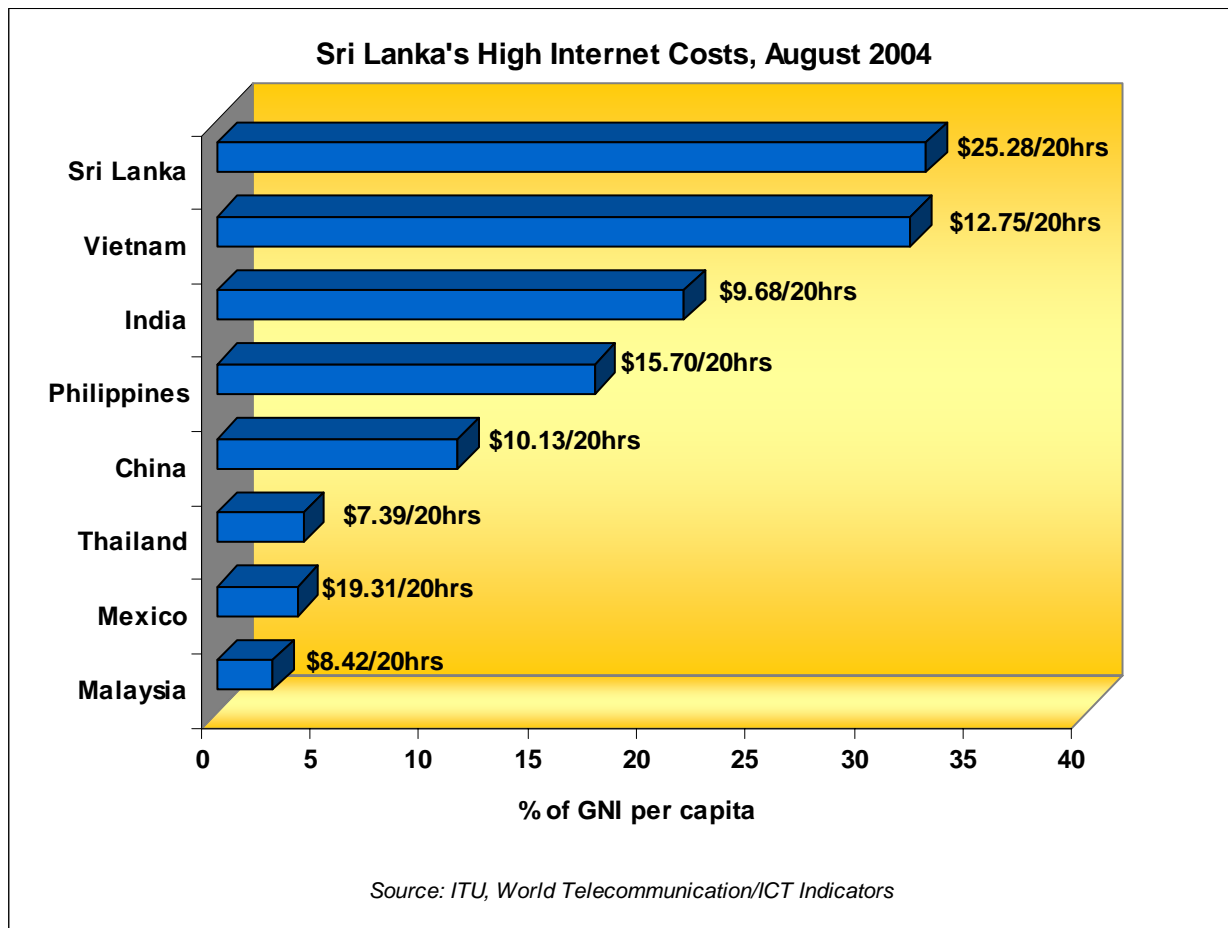
offer world class services at affordable rates to the people of Sri Lanka.”<sup>16</sup> The addition of another player will help bring down the costs and improve the spread of connectivity across regions.

## Key Challenges for Sri Lanka

### *High Costs of Connectivity and Lack of Competition*

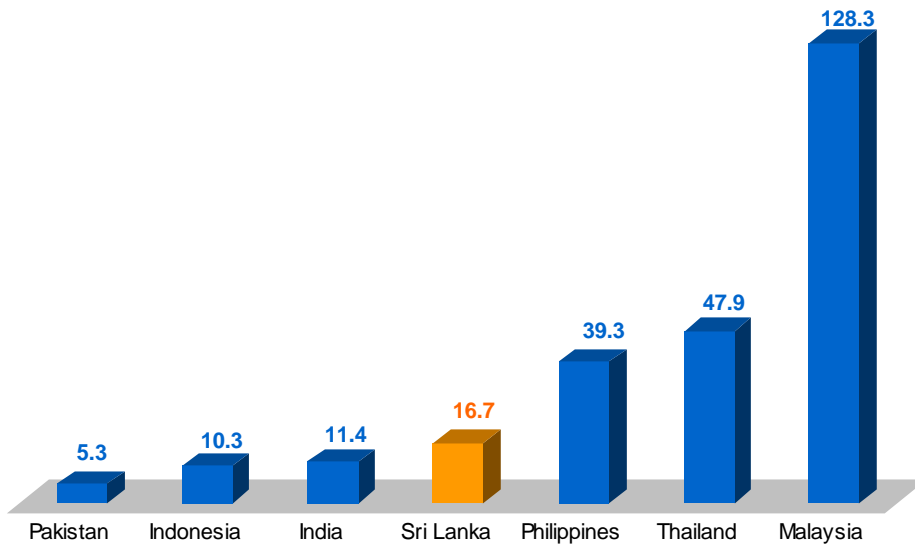
**Sri Lanka pays some of the highest costs and receives low quality services for internet connectivity in the South Asia region.** The country’s high costs are a reflection of the lack of competition present within the fixed line market. Sri Lanka’s price basket for 20 hours of internet amounts to \$25.28, more than four times the cost of that in Malaysia (Figure 12). What is even more significant and alarming is that Sri Lanka pays these high prices for some of lowest quality services in the region (Figure 13). A more competitive environment is needed to reduce costs and improve coverage and service.

**Figure 12: Sri Lanka's Internet Costs remain uncompetitive in relative and absolute terms**



<sup>16</sup> Lanka Business Online, January 2007

**Figure 13: Sri Lanka's low bandwidth per inhabitant**

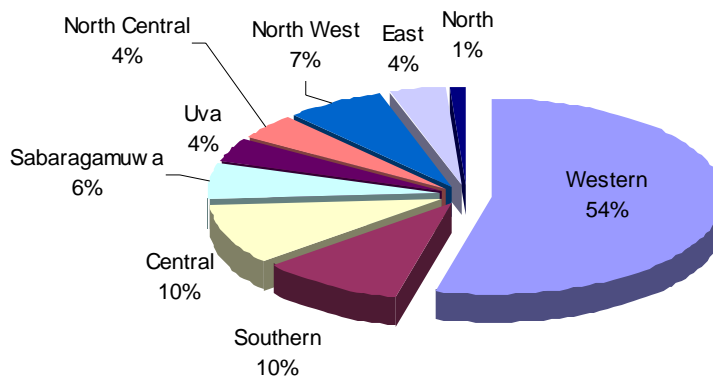


Source: ITU World Telecommunication/ICT Indicators

*Poor Rural Connectivity and Penetration*

**Access to telecom infrastructure services is predominantly concentrated in urban areas and among the relatively wealthy centered in Colombo, Galle, and Kandy.** In order to strengthen the information infrastructure and make more individuals IT literate, connectivity must reach Sri Lanka’s currently excluded groups. A total of 808,670 fixed phones were located in the Western Province in June 2006, while only 22,124 were in the Northern Province.<sup>17</sup> With such large disparities between the levels of connectivity between provinces, the question arises of why these groups are still isolated. Many have argued that the opportunity costs associated with providing connections in rural areas is large due to the small amount of prospective subscribers, minimal usage, and the difficulties in collection. Money is available through the e-Sri Lanka initiative to support subsidized roll-out of broadband connectivity to the whole island.

**Figure 14: Western Province has the lion's share of fixed line connectivity**  
**Provincial Distribution of Fixed Phones in Sri Lanka in 2006**



Source: Telecommunications Regulatory Commission of Sri Lanka, "Financial Analysis of the Telecom Sector"

<sup>17</sup> TRC, Telecom Sector Financial Analysis

### Box 3: Why does rural penetration remain low in Sri Lanka?

- Incumbents, namely SLT, do not see the economic gains from rural connections because they see only originating revenues; not the revenues generated elsewhere on the network from calls made to the rural areas. Unless the country has an appropriate interconnection regime in place, this problem will not be solved.
- More innovative new entrants will not go the rural areas because of the high costs associated with it. The highest cost item for a new entrant is backbone and it makes little sense to build backbone until a provider has developed enough traffic. In the early stages, most operators want to be able to use the incumbent's backbone on a non-discriminatory and cost-oriented basis.
- Operators have a choice on where to invest and investment is always constrained. Thus, it is reasonable that operators make assessments about where to put their investment dollars. This depends on costs (costs to use backbone; cost of getting a local authorities permission to build an antenna tower, etc.) and perceived revenues (how much the rural population is willing to spend on telecommunications).
- The hesitancy of operators to go to rural areas suggests that there is a real capital barrier in Sri Lanka's rural areas. Therefore, under e-Sri Lanka there was an attempt to implement a US \$20 million least-cost subsidy auction for the Deep South quadrant and the North East triangle. The money was obtained, the research was done, but the subsidy scheme failed to be completed as the idea of a "level playing field" does not exist within the telecommunications sector.

*Source: Rohan Samarajiva, former Director-General of the Telecom Regulator Commission on the Lirneasia blog.*

## Policy Recommendations

**Bring down costs by facilitating competition.** The high costs of connectivity prevent more people from using ICTs and discourage current users from using them more widely and regularly. And future increases in the already high telecommunications rates will further inhibit public, private and civil society sectors' use of ICT. The TRC needs to promote preferential rates and other benefits for internet users, by facilitating a competitive telecommunications environment within an effective regulatory regime that ensures fair enforcement of government policy, holds operators accountable for performance, addresses consumer issues, monitors changing industry needs and provides feedback to the policy making units.<sup>18</sup> The regulatory regime does not currently provide cost-based access to the backbone and thus, the main market operators offer their own subsidiaries preferential terms and conditions for access to the network. A competition commission would be able to address these issues and create the required level playing field. The government should consider revising the telecommunications law to address the issues of fair competition within the sector.

**Increase rural sector connectivity by offering both infrastructure services and IT training.** The digital divide itself can soon become a new dimension to poverty, leading to serious consequences for a country already suffering from growing inequalities. According to 2001 data, over 90 percent of internet connections and almost 54 percent of fixed line connections were in the Western Province. Particular attention must be paid to mobilizing ICT tools to solve problems of productivity, employment and income generation in rural areas where poverty is widespread. An explicit Universal Access Policy, to promote access to ICTs in rural areas and for all citizens should be established.

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<sup>18</sup> UNDP, 2004.

**Create an enabling legal framework:** Developing the country's ICT infrastructure cannot be implemented without improving the legal framework. The absence of laws and regulations leads to protracted legal situations. Sri Lanka desperately needs to establish a modern competition policy, and subsequently resolve ambiguities surrounding the relationship between the commission and the government. The commission should not report to a government official and it should not be staffed by ex-employees from the erstwhile incumbent. The commission should be given greater independence and authority for its regulation, as well as complete transparency and public participation in its procedures. Essentially, the transformation of the telecommunications market structure and regulator towards a more liberalized, technology-neutral model with few restrictions on cross ownership of multiple networks and services; the immediate opening up of the international services market, with no predetermined limitation on the number of licenses or the type of services to be offered; and a liberal licensing regime to permit maximum entry will be instrumental to the growth and development of Sri Lanka's information infrastructure.<sup>19</sup>

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<sup>19</sup> UNDP 2004.