

# Diffusion of Information and Communication Technologies: A Comparative Study of South Asian Region

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## Abstract

Emerging economies are quickly embracing the importance of information and communication technologies (ICT) toward overall achievement of socio-economic goals. This calls for greater insight into state of national ICT for the evidence based decision making process. Current study provides a comparative status of level of penetration of different information and communication technologies in the South Asian regional economies and tries to link some of the key underlying factors for the difference in the level of ICT penetration among them.

**Keywords:** Information and communication technologies, ICT diffusion, Technology achievement, South Asian countries.

## Introduction

Information and communication technologies (ICT) refer to those technologies that are used for collecting, storing, editing and communicating information in different shapes (Hertel and Millis, 2002).

ICT sector can contribute immensely toward socio-economic development of a country. As an enabling technology ICT can cause an enhanced global competitiveness of a country's products, processes and services. In addition, ICT can impact positively on governance service delivery as well as productivity of other sectors of the economy. Further, it may effectively assist international economic integration, improve living standards, narrow the digital divide, and improve biodiversity utilisation and management.

There is hardly any doubt that the development and utilisation of statistics and indicators are among the modern tools employed by the emerging knowledge-based economies to monitor and guide their cross sectoral policy directions (Alrawabdeh et al., 2012). With the greater intervention of the information and communication technologies, there has been a growing interest in key indicators to monitor and track the pattern of ICT integration within societies. One of the pressing reasons for this is the potential that ICT bears to reshape and accelerate development of socio-economic environment.

Although collection and assimilation of ICT statistics has remained a regular component of the policy making process for many decades in the developed economies, the realisation of the need for ICT statistics has only lately been noticed in the developing economics, led by some of the economies, which have targeted ICT as one of the

instruments for socio-economic well being.

The ICT industry has direct economic significance as an independent sector. In addition, it also makes a substantial indirect contribution to domestic economic growth. For example, the modern communication infrastructure positively affects economic growth by augmenting the process of information dissemination and promoting the development and adaptation of innovations. The recent empirical studies show that there is an average increase in per capita income of a country between 2.7 and 3.9 percent after the broadband has been introduced in the country as compared to the figures of pre-broadband era. Similarly, in terms of the distribution of broadband infrastructure, a 10 percent point increase in the broadband user base results in an average increase in per capita economic growth between 0.9 and 1.5 percent points (Czernich et al., 2009).

This study evaluates the key ICT indicators in the context of diffusion of these technologies in the South Asian economies and compares with the global diffusion patterns. The key indicators, used for the comparison, include content language of websites, population having access to fix and mobile telephone lines, internet usage, access to personal computers and broadband.

## Materials and Methods

This study was carried out at Pakistan Council for Science and Technology and was based on statistical data analysis. One of the common issues faced in statistical data analysis is the availability of reliable data sources. It was not possible to collect data of all the indicators directly, hence, secondary data source in the form of statistical publications of leading international bodies have been employed and relied upon.

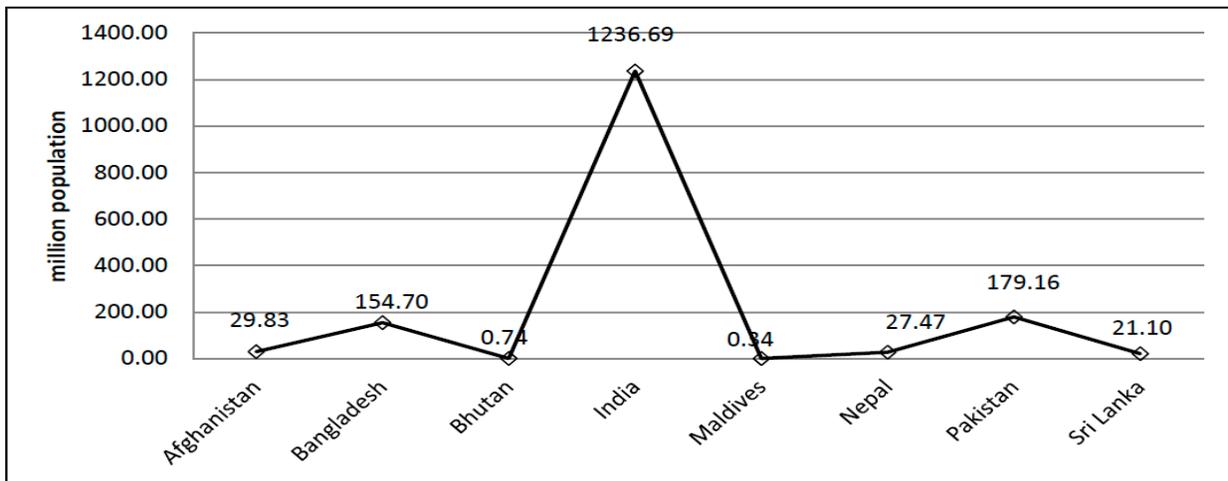
In spite of the fact that the available secondary data for the research saves time and effort, and helps to overcome some of the limitation involved in collection of primary data; nevertheless the major concerns remain on obtaining high quality and valid data. Therefore, a study on the issue of ICT data of South Asian countries available on internet was carried out and assessed in term of its reliability. The data employed in this study was acquired from accredited international organisations, such as, World Bank, United Nations and International Telecommunication Union.

**Results and Discussion**

Population figures are no doubt the most important and informative, since they offer the base for measuring several key indicators such as per

capita gross national product, tertiary enrollment ratio and penetration pattern of different ICT. Although, such indicators are most pivotal for government agencies to plan and structure their developmental strategies; they are also equally useful for different national and international institutions to benchmark the performance of countries within and between the regional economies in various areas of development.

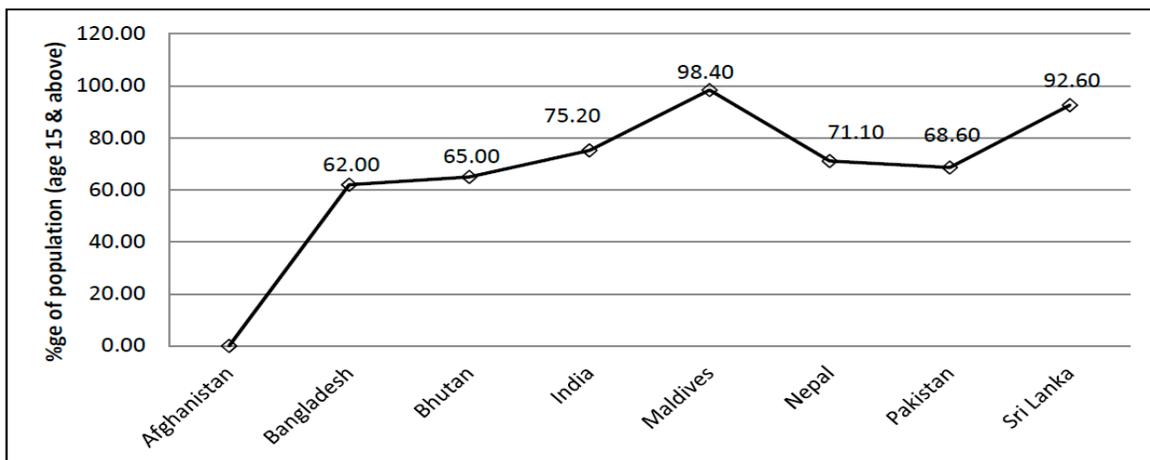
South Asia, comprising South-Himalayan countries (geographically located in South of the Asian continent), is the world’s most densely populated area. This includes Bangladesh, India, Sri Lanka, Pakistan, Nepal, Bhutan, Afghanistan and Maldives. Fig. 1 presents population figures in South Asian countries for the year 2012.



**Fig. 1. Population of South Asian countries (ESCAP, 2013).**

Literacy level of the country plays an important role in understanding and determining the levels of ICT penetration. At the upper end of the scale, it may be found that Maldives, Sri Lanka and India register a higher literacy rate of 98.40, 92.60 and 75.20, respectively (Fig. 2). While looking at the

Internet penetration indicators of the three countries, which are presented later in the paper, it will be noticed that all of them register a higher ICT penetration level. While low penetration rate in other countries can be attributed to low level of literacy levels.



**Fig. 2. Adult literacy rate of South Asian countries (ESCAP, 2013).**

### Language indicator

Hindi, Urdu and Bengali are among the most widespread understood and spoken languages in the South Asia. Regional language used on the internet for content provisioning is an important indicator to reflect the level of growth in usage of different language in ICT. Fig. 3 illustrates the leading

content provisioning language on the Internet. It is evident that not a single language from South Asia is represented on the list of top 20 languages being used for content provisioning on the internet. Each of the three languages, Hindi, Urdu, Bengali, collectively account for only less than 0.1% on the internet.

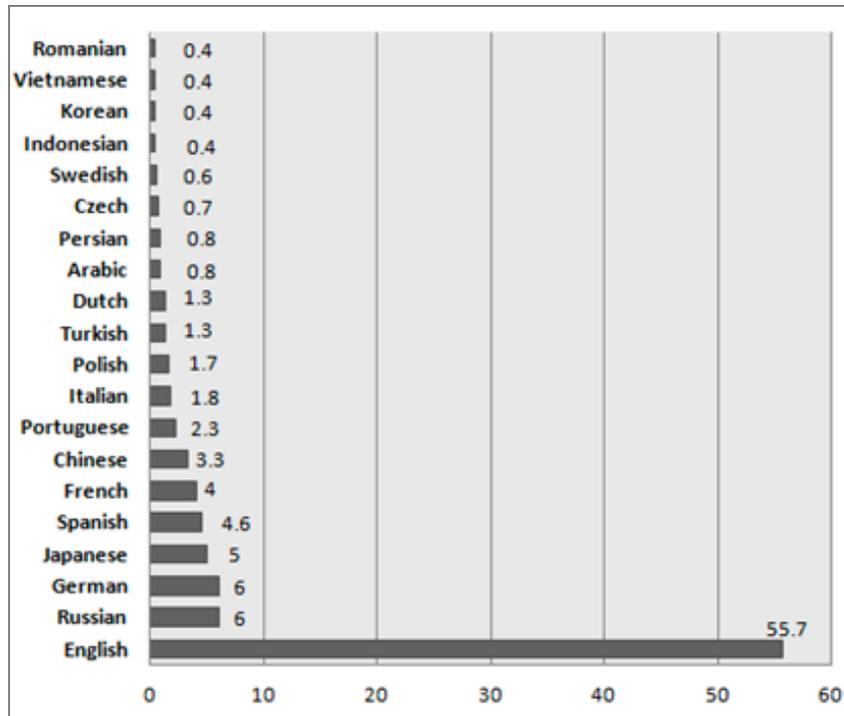


Fig. 3. Content language of websites most visited (Wikipedia, 2014). (Languages used on the internet. [http://en.wikipedia.org/wiki/Languages\\_used\\_on\\_the\\_Internet](http://en.wikipedia.org/wiki/Languages_used_on_the_Internet) [October 2, 2014]).

### Mobile cellular subscription

Maldives, although a tiny economy, holds the highest position in the South Asian region as of 2013 for number of mobile-cellular users per

hundred inhabitants, which is followed by Sri Lanka, as shown in Fig. 4. There is no significant difference in the mobile-cellular user density in the rest of South Asian countries.

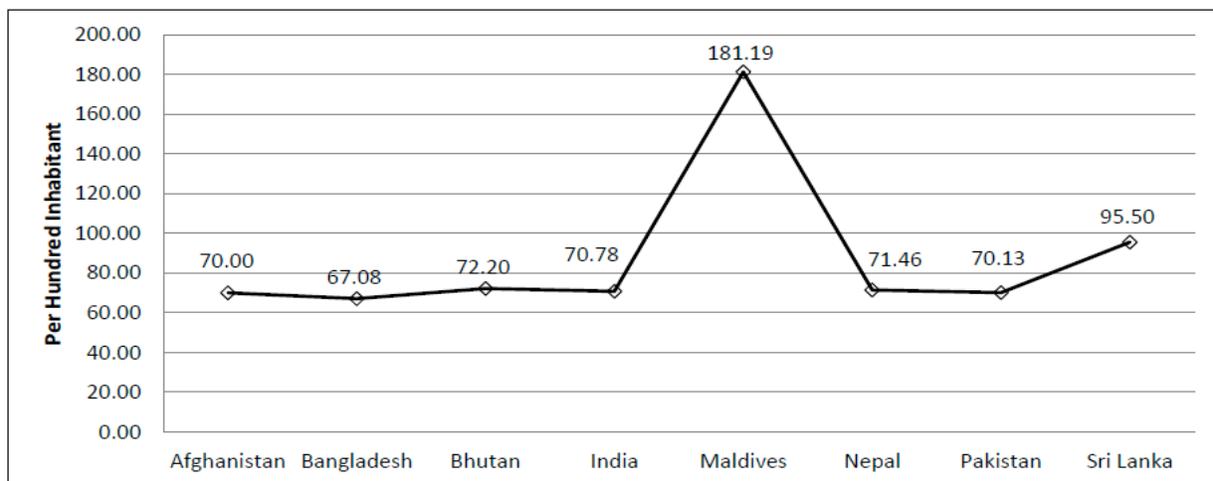
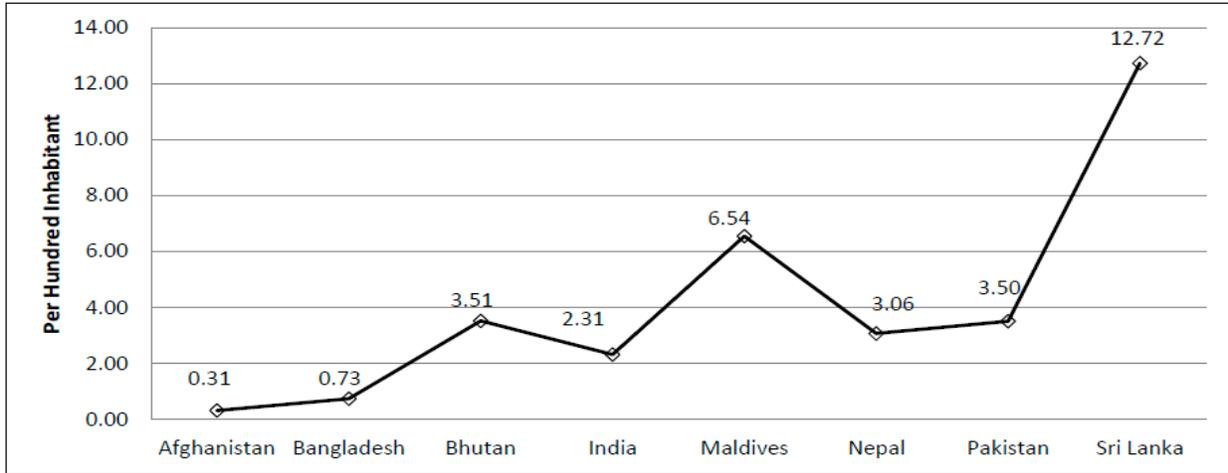


Fig. 4. Mobile-cellular telephone subscriptions per 100 inhabitants (ITU, 2014).

**Fixed-telephone line subscription**

Sri Lanka is positioned on top in the South Asian region as of 2013 for number of fixed-telephone line subscription per hundred inhabitants followed by Maldives. Bangladesh and Afghanistan

trail the South Asia, ranked on 7th and 8th place, respectively, as shown in Fig. 5.

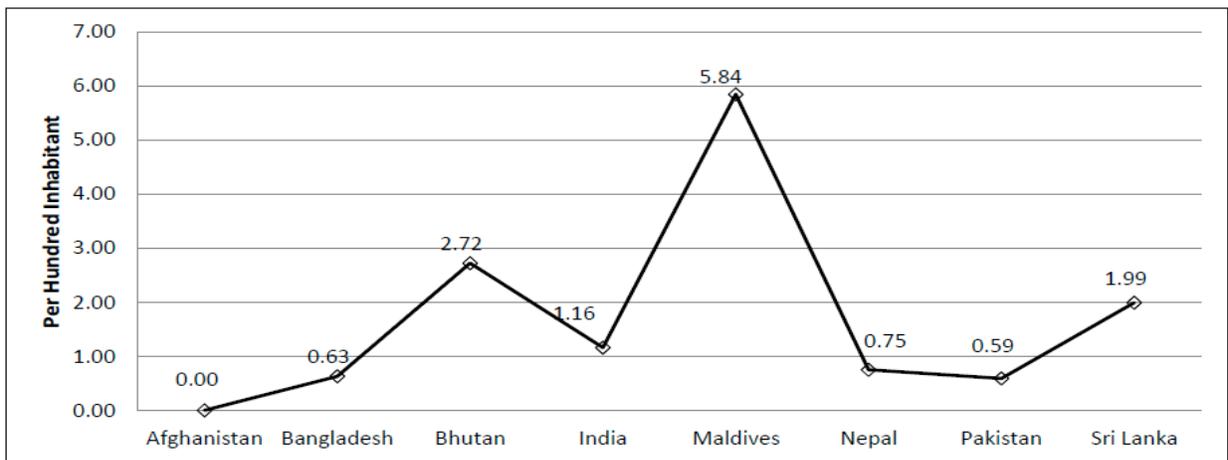


**Fig. 5. Fixed-telephone subscriptions per 100 inhabitants (ITU, 2014).**

**Fixed (wired) broadband subscription**

Maldives holds the highest position in the South Asian region as of 2013 for number of fixed (wired)-broadband subscriptions per hundred inhabitants. There is no significant difference in the fixed broadband subscription density in the rest of south Asian countries with the exception of

Afghanistan due to internal turmoil and economic instability *vis-a-vis* rest of the regional countries (Fig. 6).



**Fig. 6. Fixed (wired)-broadband subscriptions per 100 inhabitants (ITU, 2014).**

**Internet users**

In term of percentage of individuals having internet access or using the internet services, Maldives and Bhutan are ranked at 1st and 2nd,

respectively, in the South Asian region which is followed by Sri Lanka, as shown in Fig. 7. There is no significant difference in the Internet users in the rest of South Asian countries.

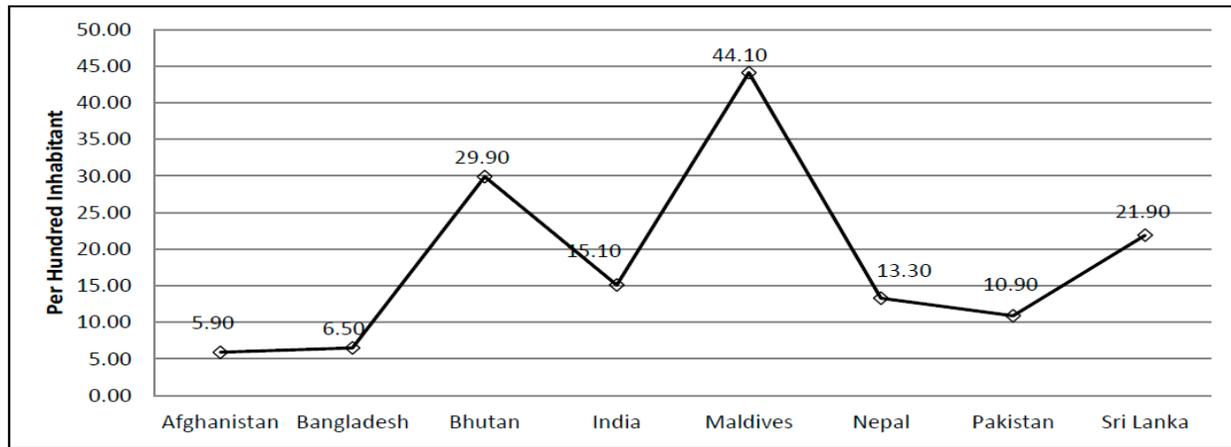


Fig. 7. Percentage of individuals using the Internet (ITU, 2014).

### Conclusion

The divergence in ICT diffusion in the South Asian countries is probably one of the reflections of difference in literacy level and economic growth (income as measured by gross domestic product (GDP) or per capita income). The penetration of ICT among the population significantly increases with improvements in the economic condition of the country as well as with the provision of better opportunities for masses to educate themselves. Thus, the better literate and growing economies, like, India, Sri Lanka, which have a higher GDP and also have higher ratios of population with access to ICT.

Regulator and legal framework is also an important driver for fast pace diffusion of ICT technologies. Liberalisation, privatisation and demonopolisation of this sector can act as catalyst for ICT adoption, which in turn is linked to economic growth of a country.

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