Special Section 2: The Role of ICTs in Growth & Poverty Alleviation

The world today is revolutionized by information technology. It plays a key role in every sector, be it economic or social. This section discusses how Information & Communication Technology (ICT) contributes towards poverty alleviation and overall growth of the economy. ICT-based initiatives are only a tool that will be effective to pace up the process of poverty reduction; though given an environment of prudent policies and careful management according to the requirements of the economy. A few success stories and major government initiatives for Pakistan also form part of the discussion.

1.1 Introduction

Information and Communication and Technology (ICT) commonly refers to the newer technologies of computers, internet and phones and also believed to incorporate media such as radio, television and libraries, due to their role in the transmission of information. The Information Society represents an era where productivity and competitiveness for firms, regions and countries depend more than ever on information. Its creation, processing and dissemination are the most significant economic activity of today's global economy. In his works of 1969 Peter Drucker identified knowledge as foundation of the modern economy, and a shift from a goods' economy to a modern economy. ICTs have been the leading enabler of this transformation.

In order to better understand the impact of ICTs on Growth and Poverty Reduction it is important to understand the channels through which ICTs shape an economy. The two major channels are as follows;

1. **ICT-as a sector of the economy:** ICTs as an industry and its value addition to other industries contribute towards the growth of the economy at large.

2. **ICT-as enabler of socioeconomic development:** ICTs enhance the social impact of developmental projects. This facilitating and enabler role becomes apparent by looking at the following sub-categories
    - ICTs aid in enhancing human productivity and creating resource efficiencies by extending tools for optimizing contribution.
    - By providing access to information and shrinking time and space ICTs have opened up a wide new range of opportunities for their users.

However, the impact of ICTs in a country or a region depends on its nature, the purpose of its deployment and spatial spread, besides the economic, administrative and social environment backing up the strategy of its diffusion.

1.2 ICTs a Catalyst for Growth:

A historical correlation exists[1] between higher rate of economic growth and technological innovation. The real contribution of ICTs remained debatable till recently when computers themselves enabled researchers to analyze large amounts of data, providing some more definitive answers (see **Box 1** for success stories). Current world economic growth is primarily driven by innovation in processes, value chains and business models. Services have become a major part of economic activity and an increase in production is paramount for competitiveness.

Box 1: Success Stories

- Microfinance is an important tool for helping the poor. Smart card technology is helping Swayam Krishi Sangam(SKS), a microfinance institution in Andhra Pradesh in India to reduce transaction costs. IT has been a solution to high cost of delivery, with potential savings of 18 percent in SKS operations.
- 'Auto Bank E' of South Africa has developed a fully automated saving system aimed at poor depositors. An account can be opened with only US$8 and provides customers with a range of electronic banking services. The system is highly popular with 2.6 million depositors and 50,000 more being added each month.
- Naushad Trading Company; Kenya, a producer of wood-carvings, pottery and baskets saw its revenues growing from US$10,000 to over US$2 million in two years since going online.
- Chile Compra, a public online system for purchasing and hiring achieved great success since its inception in 2000. It is the largest business to business site in Chile with 900 purchasing organizations, including public services, hospitals, municipalities, universities, and the military. On an average 130,000 companies get registered each month and 70,000 business negotiations transacted. There were 270,000 operations with US$1.9 billion in transactions, reaching to US$2.5 billion in 2005.
- Chile's Inland Revenue's site launched in 1995 was a big success. Over 96 percent of Chilean taxpayers pay their income taxes through the internet. This has also led to high taxation compliance in the country.

Recent econometric studies have found strong evidence of a causal link between telecommunication development and economic growth. According to a study in 2002 on "Elasticity of Productivity with respect to Information Technology (IT)" by Kevin Stiroh[2], IT appeared to be strongly associated with higher firm level productivity. His research results showed that doubling the IT capital stock led to a 5 percent rise in productivity. Despite this relationship, various studies highlight huge variations in the average impact of IT on firm productivity. One of the significant reasons for this variation is the different environment into which IT is introduced.

[1] The Global Information Technology Report 2005-06, Leveraging ICT for Development, World Economic Forum.
[2] Federal Reserve Bank of New York.

The International Monetary Fund (IMF) noted[3] that between 1995 and 2000, ICTs contributed to an average increase in total factor productivity (TFP) growth of about one-third of a percentage point per year in industrial countries and that the contribution of ICTs can be significant to productivity growth in Asian economies as well. Within this background, India introduced major reforms that led to a dramatic increase in IT's growth from 3 percent per annum in 1991 to the present[4] average of 6.1 percent annually

Moreover, India is operating the largest[5] telecom network in Asia and is the 10th largest in the world measured in terms of number of phones. The annual growth rate of India's software exports has been consistently over 50 percent since 1991 and the revenue has increased from US $150 million in 1991-92 to over US $2.15 billion in 2003-04. The country has been able to expand its industry-related employee base to over one million in 2004-05.

While many have benefited from the use of ICTs, Pakistan was a little late in joining the bandwagon. However the current regime, realizing this lag, has undertaken various initiatives to gain from opportunities offered by ICTs.

Table 1: Pakistan ICT Competitiveness FY06

Networked readiness index rank	67
Environment component index	76
Market environment	58
Political & regulatory environment	79
Infrastructure environment	101
Readiness component index	67
Individual readiness	79
Business readiness	73
Government readiness	41
Usage component index	61
Individual usage	109
Business usage	64
Government usage	35

Source: The Global Information Technology Report 2005-06

According to Networked Readiness Index (NRI) [6] of FY06, Pakistan has been ranked[7] 67th amongst the group of 115 countries. Though this is an improved position as compared to 76th in FY 04 amongst the group of 102 countries, still the penetration of ICTs in the economy remains low. Detailed analysis of the index explains that the penetration of ICTs is the lowest in the government's category as indicated by

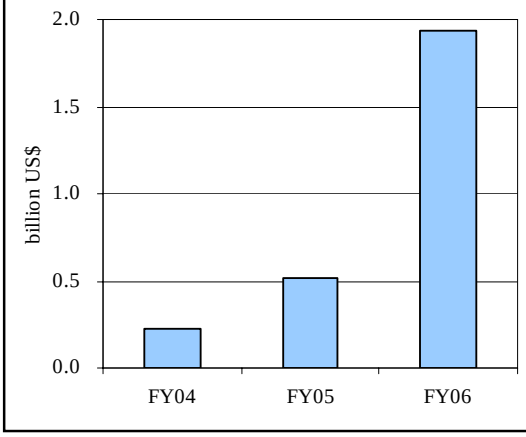
[3] The Global Information Technology Report 2005-06, Leveraging ICT for Development, World Economic Forum.
[4] Uptill 2005-06
[5] Source: www.indiacore.com
[6] NRI is benchmark of the overall success of a country in participating and benefiting from ICT. This index is the combination of three indices i.e. Environment, Readiness and Usage.
[7] The Global Information Technology Report (2005-06), Leveraging ICT for Development, World Economic Forum

Government Readiness and Government Usage (see **Table 1**) while Individual Usage (109th position) of ICTs is substantial. The position of the country in the category of Infrastructure Environment (101st position) represents a conducive environment for penetration of ICTs into the economy.

Better position of Infrastructure Environment can be associated with significant growth of the IT sector over the last five years. An integrated IT policy focusing on human resource, infrastructure, and software industry development was implemented in August 2000.

Investment incentives like income tax exemption for 15 years on income from export of software, zero custom duty on imports of software and hardware were introduced. Exporters can now retain 35 percent of foreign exchange earnings, and have a permission of opening Internet Merchant Account[8]-a move to promote e-commerce. Regulations are being legislated for venture capital companies and funds. Pakistan Software Export Board (PSEB) has been established to ensure the developments and implementation of a national policy framework. Telecom Deregulation Policy and Cellular Phone Policy were announced in 2003 and 2004 respectively. To enhance the rural Teledensity and to provide basic telecom services to under and un-served area of the country, the government has brought legislation for developing Universal Service Fund (USF) framework.

Figure 1: Trends of FDI in Communication



A considerable rise in foreign direct investment (FDI) can be observed in IT sector as a result of a conducive and liberalized environment in the country. FDI has jumped (see **Figure 1**) from US $ 0.22 billion in FY04 to US $ 1.94 billion in FY06. Global System for Mobile Communication (GSM) [9] Association has awarded Pakistan its prestigious Government Leadership Award for introducing successful reforms in the country's telecommunication sector. Mobile phone

[8] State bank has granted this permission.
[9] GSM is the global trade association that exists to promote, protect and enhance the interests of mobile operators globally.

subscribers have shown a growth of 98 percent over the last five years and reached 16 million in FY05 from almost 0.3 million in FY00. Teledensity has been improved from 2.4 percent in FY00 to 13.7 percent in FY05. Internet users at growth rate of 76 percent increased over 2 million in FY05 as compared to 0.5 million (see **Table 2**) in FY00. Given these positive trends, there is still room for Pakistan to explore various dimensions of ICTs leading towards economic growth and poverty alleviation.

Table 2: Penetration of ICTs

Years	No. of payphone companies	Internet users (millions)	Cellular subscribers (millions)	FL+WLL subscriber (millions)	Total density (percentage)*
2000	32	0.5	0.3	3.1	2.4
2001	64	0.8	0.7	3.3	2.8
2002	99	1	1.7	3.7	3.7
2003	164	1.6	2.4	4.0	4.3
2004	281	2	5.0	4.5	6.3
2005	364	2.1	12.8	5.5	11.89

* Teledensity is for Fiscal Year

Source: Pakistan Telecommunication Authority(PTA) Web site

1.3 ICTs a Tool for Poverty Alleviation:

Poverty is generally understood as individuals living below subsistence income levels. According to this definition, the World Population Data Sheet[10] 2006 report that of the world's 6555 million people, 3474 million are living below the poverty line of US $ 2 per day with 36 percent residing in South Asia. Over time policy makers have broadened the definition of poverty by including in it the state of malnutrition, lack of shelter and inaccessibility to health and education services, unemployment, powerlessness and lack of freedom. According to this redefinition, the figure for the world's poor population has automatically become greater than the above mentioned number.

Many would argue that lack of access to ICTs is not as serious as malnutrition, inadequate shelter, access to medical facilities and clean drinking water- the basic survival needs. However the majority now believe that ICTs have the potential to enable countries that missed out on opportunities of agriculture and industrial revolutions, leapfrog stages of growth. Now the establishment of the World Summit on the Information Society (WSIS) would help in mainstreaming of ICTs

[10] World Bank Publication

for development that would help to curtail excessive enthusiasm and skepticism for ICTs.

ICTs can play an effective role in poverty alleviation but reducing poverty through ICTs is not guaranteed. ICTs can enhance poor people's opportunities by improving their access to markets, health care and various government services. Progressive technologies not only contribute towards a pro-poor growth by increasing production in IT sector (as a sector of economic activity) but also through their strategic use in others areas (as an enabler for enhancing Human Productivity & the Choice of opportunities). The Millennium Declaration 2000; a unanimous resolution adopted by the world community against poverty, has also highlighted the importance of ICTs towards poverty alleviation by making it a part of the Millennium Development Goals (MDGs)[11]. Few countries[12] have defined ICTs as a strategic component of poverty reduction and refer to it as an independent item in their PRSPs. Although most countries have not included ICTs as an independent strategic component, but they still refer to the telecommunication sector development as a major contributor towards the growth of the economy.

ICTs can facilitate achieving of MDGs by enhancing livelihoods, optimizing delivery of services, and empowering the local in planning processes e.g. Major ICTs based reforms in Chile have reduced the percentage of people below poverty line from 40 percent[13] to 17 percent. Similarly continuation of prudent policies in Taiwan over the last few decades, have resulted in a dramatic reduction in poverty and the country joining the ranks of progressive competitive economies.

The use of technology for poverty reduction varies from country to country depending upon country's limitation towards implementation of modern technology. Pro-poor ICT policy demands for a greater investment on infrastructure development which complements already prevailing flow of infrastructure to have a multiplying effect of technology and modernism on poverty reduction and growth. However, most of the developing countries[14] lack resources and are unable to direct sufficient funds for infrastructure development and thus remain short of exploiting the true potential of ICTs. With these obstacles, developing countries can depend mainly on widely available technology

[11] Goal 8,Target 18, "to make available the benefits of new technologies, especially information and communications"
[12] 12 out of the 29(Aug'2003)
[13]By 2005 Chile was able to increase its foreign direct investment to US $ 74.6 billion, an 88.5 percent increase as compared to the beginning of 1990s.
[14] With larger number of poor population

like television and radio that can reach a larger portion of population at relatively lower cost. Moreover the use of technology like television and radio requires very low level of skills and in this way also covers the hurdle of low literacy in developing countries. **Box 2** provides an insight of few international success stories where developing countries have adopted traditional technology depending upon their resources and economic growth to improve the socio-economic conditions.

1.3.1 ICT's Based Initiatives in Pakistan:

The Pakistan government widely recognizes the role of ICTs and is adopting the policies to maximize the benefit from them. ICTs are being used for human development with their penetration in education, health and employment. However, a matter of concern remain that ICTs require prudent policies and careful project designing, because even if IT infrastructure reaches the poor there is no assurance that they are going to access or benefit from it. The government of Pakistan is trying to enhance the coverage by offering maximum possible opportunities in almost all major sectors of the economy. Following are the major initiatives taken by the government to capture all the possible aspects of poverty (see **Box 2** for International stories).

Pakissan (www.pakissan.com) is the first portal of its kind providing comprehensive information about agriculture in Pakistan in both the languages English and Urdu as larger portion of population linked to this profession is not highly educated. This portal does not only act as a point of contact for farmers and the communities related to agriculture but also provides useful information like corporate financing techniques and marketing techniques. Moreover this information portal contains the details of all government rules, policies, procedures and incentives to facilitate the farmers. However, lack of infrastructure limits the scope of this kind of projects.

The government is trying to increase e-commerce business revenues. In this regard the most significant step is the establishment of Pakistan's first B2B (business-to-business) portal, "Industrial Information Network" (IIN). IIN is serving as the largest source of exchanging and disseminating business information in the country.

The major initiatives of the government in the education sector involve establishment of seven IT universities (including one virtual university as a distance learning and information portal). Allama Iqbal Open University (AIOU) is the largest distance learning institute in South Asia. IT and telecommunications

ministry is in the process of making 25 existing universities specialize in IT discipline.

Considering language as the main barrier in accessing ICTs, the government is trying to introduce and develop tools like Urdu fonts, proprietary software for Urdu on Windows XP and commercially developed Urdu word processors. Grants have been awarded to develop software commercially in local languages.

Telemedpak, and PAkmedinet are two main websites providing telemedicine services (data bank of doctors, medicines, online consultation) to the public. In this regard, two major projects in Taxila and Gilgit are having significant impact by providing online services and are creating awareness about telemedicine. TelMEDPAK along with the help of Allahtuwakkal network (ATN) Group, is also trying to establish 50 telemedicine centers in rural areas of Pakistan

IT sector is providing considerable employment opportunities (o.68 million) in the country. Moreover the government has established an Overseas Employment Corporation (OEC) that holds a data bank of information about skilled labor force and the availability of job opportunities abroad.

ICTs have the potential of empowering people by providing them access to information. An example of this can be utilization of information kiosks at various government offices like NADRA, Passport Office providing information to the citizens. This would help masses to save money they used to end up giving to the private agents for information available to them through these kiosks.

Government of Pakistan is promoting E-Government projects to enhance public participation and make procedures more transparent. Central Board of Revenue (CBR) and the Export Promotion Bureau (EPB) have an on-line interaction with the public, providing them with necessary information and receiving feed back on government policies.

Given that ICTs bring tremendous opportunities with them, their implementation remains complicated. Infrastructure development plays a key role in the implementation of pro-poor ICT policy and like many other developing countries Pakistan is unable to dedicate required level of resources to infrastructure development. Moreover the diffusion of benefits of ICTs for poor also suffers from widespread illiteracy[15]. These problems undermine the utility of ICTs though the negative impact of all these can be minimized by exploiting benefits of

[15] 47 percent of population(2004-05) is illiterate in Pakistan

suitable technologies. Keeping these hurdles into consideration the role of widely available technologies like television and radio can help in enhancing access to information at relatively lower cost, requiring lower skills. Radio, one of the most accessible technologies[16]can be used as an effective tool making maximum population benefit from advantages of technology. Through the more readily available technologies like radio and television, government can disseminate already existing information on portals like Pakissan to a much larger segment of population. This does not undermine the potential of new technologies like computers and internet however reinforces the pragmatism and adaptability required in technology transfer and its utilization in developing nations.

1.4 The Way Forward

According to the International Labor Organization (ILO), ICTs have the potential to contribute towards socio-economic development but investment in them alone is not sufficient for development. Technology is just a tool for development not a goal. It is vital for people involved in developmental work to consider ICTs as a means for achieving development and not as an end in itself. An integrated approach having a focus beyond technology; including contemporary and earlier ICTs- radio in particular - can add in poverty eradication. Prudent policies, careful planning, government support and community participation are necessary for any ICT-based initiative to reduce poverty. The debate has now moved from substituting to complementing, therefore rather than making choices, ICTs should be used to lift people from the slums. There is a dire need to capitalize on the true potential of ICTs in areas of economic growth, empowerment, education, health, and environment. Lack of resources should not become an impediment in using ICTs to improve socio-economic conditions. The government should follow a pragmatic approach and use all available technologies for growth enhancement and poverty reduction. Pakistan has taken steps in the right direction; however it has an extra mile to go.

[16] Radio is the cheapest form of mass media, can easily penetrate into remote geographical regions and does not require high level of skills or education as well

Box: 2 Role of ICT in Poverty Alleviation

Education

- In China where only one out of 20 young people receive higher education, distance learning has facilitated the education process and provided access to the masses because traditional universities can not meet the demand. China Central Radio and Television University has 1.5 million students and lectures are broadcasted through radio and television.
- In Mexico over 700,000 secondary school students in remote villages have access to the *Telesecundaria Program*. Based on comprehensive course curriculum, lectures are delivered through close-circuit television, and teleconferencing between students and teachers.
- Committee to Democratize Information Technology (CDI) of Brazil has created 110 sustainable self managed community-based schools. These schools with limited funds and voluntary assistance train more than 25,000 young students per year in ICT skills which provides them better opportunities for jobs.
- Distance learning based National Open University of Taiwan was able to reach 30 percent more students than the National Taiwan University while spending less than one third of its budget.

Health

- Radio-based awareness is increasingly playing a crucial role in the fight against HIV/AIDS, tuberculosis and other diseases.
- In Andhra Pradesh India, handheld computers have enhanced auxiliary nurse midwives efficiency by eliminating cumbersome data entry and related paper work. One nurse is generally responsible for 5,000 people's immunization, family planning, and mother child education. Handheld computers have approximately reduced the time spent on these activities by almost 40 %.
- In Ginnack a remote island village on the Gambia river nurses use digital camera to take pictures of symptoms for examination by a near-by doctor. Data such as X-rays are compressed and sent to various parts of the world for a more specialized opinion.
- ICTs played an important role in the creation and implementation of programs to control river blindness in West Africa. Data collected along the 50,000 km of rivers with aid of sensors was fed into the computers and beamed to a network of entomologists by satellite radio. These efforts have protected 30 million rural people and eliminated river blindness in seven countries.

Employment:

- ILO notes that some developing countries have been able to create employment for thousands of women and men through community access points and telecentres. A group of ladies in Kizhur village Pondicherry established an incense-sticks firm. Initially they started of as subcontractors however their confidence grew by utilizing a telecentre. By acquiring necessary skills today they are seeking more distant clients using the telecentre.
- Grameen Bank in Bangladesh has provided around 1,100 telephones to the rural poor women through micro credit loans. These women are now making profit by reselling airtime to the others in village.
- ICTs empower small farmers and artisans in the rural areas. In Gujarat India computerized milk collection centers with integrated electronic weights, fat testing machines and plastic card readers ensure fair prices to the dairy farmers. Because of the new system farmers now not only benefit from a more transparent and efficient system but are also paid on the same day of delivery as compared to the earlier 10 days wait period.
- In Ghana radio the cheapest form of mass media has helped farmers increase their revenues and improve their farming practices by making information on regional market developments accessible to them.