

## **ICT IN DIGITAL ERA: A COMPARATIVE ANALYSIS OF SELECTED ASIAN COUNTRIES**

**Dr.Neelakanta N.T.\***

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### **Abstract**

ICT has the potential to enable closer interaction and universal bonds between and within national, individual, groups and institutions to portray specific and previously distant causes which may otherwise be discarded. ICT encompasses the collection, capture, processing, storage, retrieval and transmission of information, embodying text, data, sound (audio), vision (video) and graphics. Harnessing of ICT for the development of developing countries are calls for development of capabilities at different levels. This includes the capability to develop local content by taking in to account the development needs of different sectors and also the ability to make effective use of the same. Thus, it may be argued that the presence of a vibrant ICT sector capable of addressing issues like health, education, environment and gender inequality etc., It may be facilitates for the diffusion of Information Technology.

**Key words:** Information and Communication Technology, Challenges, Asian Region

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\* **Assistant Professor, Department of Studies and Research in Economics. Tumkur University**

## I. Introduction

Information and Communication Technology was emerged in South Asia after 90's. From the last one decade we had experience of new innovation and inventions in the ICT sector (Nagesh, 2000). People from one country to another country people can exchange their view, information and messages each other easily with low fare, due to the effectiveness of ICT in developed as well as developing countries. If we were remember situation of information and communication in early 80's then it is very difficult to compare present with past situation. Because of that time for communicating or exchanging information among the people takes more time as well as money (Srinivasan, 2005). But now, ICT not only attract the people but also satisfy their essential needs like education, employment, health, culture and entertainment aspects and so on. At present, not only urban people are exploiting the ICT but also rural people moving fast direction they won't live without ICT. In this way ICT becoming significant as well as one of the robust income source to the respective governments of developing countries. Following words of M.S.Swaminathan (who is a pioneer of green revolution in India) hold the relevance of ICT.

*“The Mission for achieving a knowledge revolution in India derives strength and confidence from the numerous outstanding initiatives underway in the country under the sponsorship of Central and state governments, civil society organisations, academia and the corporate sector. The beneficial impact of ICT on the rural economy and quality of life is now widely recognised”.*  
(Swaminathan, 2006)

In the case of Asian region, perhaps three stages of systematic technological development could be loosely demarcated. The first refers to advanced levels of industrial and technical skills in the pre-colonial era. This failed to serve as a sufficient basis for launching a successful of the Chinese experience, contrasting sharply with the British or Japanese case. The post-colonial state-centered of import-substituting technological industrialization was built massively in the time of two world wars. A third, dramatic episode of systematic technological change in South Asia takes place in the form of the recent, ongoing ICT revolution (Ashwini and Vijayabaskar, 2005).

ICT is encased by a new vision of exchanging information across borders and creating the scope of unique form of human relationship. This may create space for more democratic and creative expansion, or indeed, have the reverse effect; depending on the relative economic, social and political power specific internet groups can harness to champion their grievances. Analytically, the contribution of ICT to economy could be viewed at two different but interrelated levels: on account of ICT growth and on account of ICT diffusion. The former refers to the contribution in output, employment, export earning as well spreading social awareness etc., on account of the production of ICT related goods and services which are confined to just one segment of the economy or country (Kraemer and Dedrick 2001). But ICT has the potential to enable closer interaction and universal bonds between and within national, individual, groups and institutions to portray specific and previously distant causes which may otherwise be discarded. ICT encompasses the collection, capture, processing, storage, retrieval and transmission of information, embodying text, data, sound (audio), vision (video) and graphics. Harnessing of ICT for the development of developing countries are calls for development of capabilities at different levels. This includes the capability to develop local content by taking in to account the development needs of different sectors and also the ability to make effective use of the same (Joseph and Abraham., 2005). Thus, it may be argued that the presence of a vibrant ICT sector capable of addressing issues like health, education, environment and gender inequality etc., It may be facilitates for the diffusion of Information Technology.

## **II. Objectives**

The Objectives of this study are very important for this research work. It is better to know what the objectives are. They are mentioned below.

- To assess the diffusion of ICT in selected South Asian countries.
- To study the impact of ICT on social as well as economic status of selected countries in terms of Elimination of poverty, Education, Health, Gender equality and environmental sustainability.
- Examine the emergence of India as a leader in South Asia in the field of ICT.

### III. Methodology and Type of Data used

The Methodology for this topic depends on the different programmes and projects in selected countries where it promote welfare of the people through diffusion of ICT. The Secondary data used for this study which is collected from various National and International institutions. Like World Bank, UNESCO, International Telecommunication Union (ITU) and Government Departments of selected countries and various UNDP Reports. The method of research has been done in the form of socio and economic perspective with referring to selected countries. Here notion of South Asia especially referring to only India, Pakistan and Sri Lanka.

### IV. Backdrop of ICT

It is important to recognise the history of ICT in terms of innovation. From the invention of the telegraph in 1844, the telephone in 1876, the light bulb in 1879, the first hydroelectric power station in 1881, radio waves in 1894, flow of electricity in 1904, radio with sound in 1906, birth of television in 1926, magnetophon in 1935, first working computers in 1943, the silicon chip in 1959, the telecommunication satellite in 1962, the first successful Personal computer in 1978, existence of internet with accessible to users via modern link in 1989, special connection to the internet accessible 1999, smartspce technology 2002, Video phone technology in 2004 and in futur anticipated Blue tooth with small electronic device in 2008 to enable access information from anywhere in 2008 and all above shows the entry of ICT to the world with broad sense. But in narrow sense, the first machine was invented in 1904 which was a Canadian design fom the [Ferranti-Packard](#) company, originally called the [FP6000](#). The story is that this machine with 'core store memory' fired up with its program still in store after its sea freight journey from Canada. One feature of these mainframes was the common instruction set throughout the range meaning that programs written and compiled on one machine would run unchanged on any other. In fact the hardware was different between machines. To achieve this program termed as "the executive" or *exec* encapsulated the hardware and supplied software routines to supplement the hardware supplied instructions. By 1968 ICT had merged with English Electric computers and become International Communication Ltd (ICL). There are two types of information handling device. The first is analogue. The second is digital, based on counting numerical digits. But ICT revolution tends to replace with analogue with digital. Today we can see so many digital systems in the world.

## **V. Influence of ICT on Socio-economic Status of Selected Countries**

UNDP's Human Development Report 2001 points out that, "technology is created in response to market pressures-not the needs of poor people, who have little purchasing power". In this climate, governments are started to look at urgently and closely in to the relationship between information and communication technologies, and development. The UNDP's Human Development report correctly asserts that it is a pre-requisite for governments to first recognize that technology policy affects a host of development issues, including public health, education and job creation. As we seen in the above statement of the HDI reveals that ICT will helpful not only to the society but also for economic development of each and every country. However, Influence of ICT on Socio-economic status can be broadly divided in to the following points.

- ❖ Elimination of Poverty
- ❖ Agriculture Development
- ❖ Improving in Quality of Education
- ❖ Impact on Health
- ❖ Enhancement of Gender equality
- ❖ For maintaining good environmental sustainability

### **5.1: Elimination of Poverty**

Asia context, especially South Asia is constituted with high level of poverty and this is become main obstacle to the development of country. For eliminating this social as well as economic disease form the world UNESO formulated different kinds of programme and projects. Apart form this programmes, ICT has its own impact on the elimination of poverty. Basic phenomenon is all new technologies that restructure production and raise productivity can, all things being equal, increase in the per capita income as well as reduce the incidence of poverty and hunger. How ICT contribute for the alleviation of poverty can seen through current examples, it can come either through the employment-generating effects of the diffusion of these technologies in to rural poor and urban areas or through enhancing returns from economic activities undertaken by poorer households.

Some time, effect of ICT on poverty differs greatly, depending on which technology is better. As compare to Internet and PC, radio and telephony are cheap and for using these things require few

skills while in terms of content and language, they enjoy great flexibility. Now days, Radio and TV are becoming effective ICT tool in the rural development. These tools are used for penetration of education, health and agriculture services. One often cited example of successful ICT use in poverty reduction is the Grameen Bank's Village Pay phone initiatives. It is village based micro-finance organization in Bangladesh. In this most of member are women who received loan for to buy cellular phones at taka 18,100 a piece.

**Table.1: ICT uses for eradication of poverty and hunger**

Indicator	ICT contribution – Local content
<ul style="list-style-type: none"> <li>▪ Proportion of population below US\$ 1 day</li> </ul>	<ul style="list-style-type: none"> <li>▪ Employment opportunities- use of ICTs as methods of receiving local content on employment opportunities</li> </ul>
<ul style="list-style-type: none"> <li>▪ Poverty gap ratio (incidence x depth of poverty)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Market price-use of ICTs as method to transmit information on local market.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Share of poorest quintile in national consumption</li> </ul>	<ul style="list-style-type: none"> <li>▪ Micro credit and other credit information-increase the access to information on credit opportunities for creating enterprises.</li> <li>▪ Enhance the livelihood of poor people and communities by enabling them to benefit from the expression of their own knowledge and expertise through the use of ICTs and other media.</li> <li>▪ Access to new, overseas markets</li> <li>▪ Increasing fair trade opportunities by connecting local producers with fair trade networks</li> <li>▪ Strengthening small business and entrepreneurs- providing the tools for creating and printing flyers, managing accounts</li> </ul>

Source:UN ICT Task force, UNDP, 2003

Then they were able to rent the sets out to other villagers on a commercial basis. By in this way creating gain full employment as well as ensuring connectivity that can be exploited to various ends, *"I was not astonished to get the Nobel Prize in Peace ... Hunger is one of the main reasons of anarchy, If poverty is reduced, peace will prevail on earth"* and another statement of same person while referring to ICT, is *"I have been advocating for the creation of an 'international center for information technology to end global poverty'"*.(Mohammad Yunus, Managing Director and Winner Nobel prize for Peace 2006). However his words reveal the importance of removing poverty with technologies like ICT. **Table No.5** provides hints in terms of indicators and contributions of ICT which was prepared by UN's ICT task force for the poverty alleviation. Even though lack of credit also tends more poverty alleviation and will tends unpaid child labour from the poor family. Self help groups will play a significant role to resolve the poverty problem. Consequently, in India 'The SwayamKrishiSangam' (SKS) smart credit project is one of example of using ICT to reduce transactions costs and reduce the cost of credit provided by self-help groups. Similarly, in case of Pakistan ThreadNetHunza is another example for the use of ICT for elimination of poverty through generating employment. ThreadNet is e-commerce programme which is offers the products of local handicrafts, such as carpets and household accessories, for sale of over the internet.

## **5.2.Agriculture Development**

All most all countries in South Asia are highly depends on the agriculture. Here agriculture plays a significant role in terms of providing more employment especially for unskilled works. Some time we can find insufficient technology, but ICT is one of technology which full fill the needs of essential thing to the agriculture sector. Like, in the process of production and exchange of commodities will also be transformed by ICTs and it will also spurs the development of innovative programmes and research in the agriculture sector. Farmers are not only in the South Asia but also in world wide using ICTs to obtain market information, to bypass intermediaries and to obtain better prices for their produces. It will also enhance the food security and subsistence and by rationalization supply chain, will also ensure the productivity.

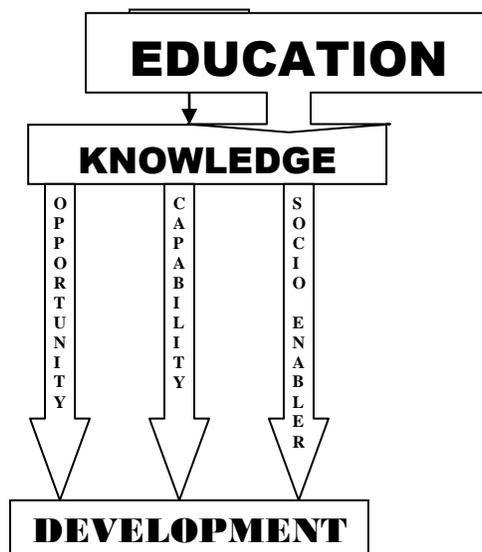
In case of India ITC Ltd has set up a network of internet connected kiosks, know as e-Choupals<sup>1</sup>, to serve the soybean, cotton, tobacco, and shrimp farmers in its procurement network. Through the e-Choupals farmer not only allowed to sell their produce directly to ITC, but also to buy agriculture inputs and consumer goods for daily household use. This “win-win” business model helps in providing both ITC and farmers low costs as well as high revenues respectively. It is also helps to prevent middlemen from farmers and buyers.

### 5.3. Improve in the quality of education

As per as education concern, ICT is playing a significant role in aim improvement in quality of education. Illiteracy is one of main obstacle for the socio-economic development of South Asian Countries. Here ICT makes effective communication between teacher and students with standardized technology. It is also creating new possibilities for reaching the unreached and also for making lifelong education feasible for all. Here concept of the quality of education is divided in to Formal Education and Distance Education.

There is interrelation between Value of ICT, Education and Development. This can also see in the Figure.5. For any human beings life starts with Education, because it is essential criteria for personal development. If we include ICT as value addition then it will create a knowledge which will enable to exploit the opportunity, capability and social enhancement. Obviously this will help to developing countries to overcome illiteracy.

**Figure.5: The value of ICT in Education**



Source: Banuri et.al.2003, Figure 1, pp21

### **5.3.1: Formal Education**

Human infrastructure facilities like schools, educational institutions and information. Most significantly, in countries with vast land areas that make assured access to education difficult, ICT is proving a boon since it reduces costs and renders distance learning much more viable than it was earlier. The teachers benefit by taking advantage of the interactive systems then it will help them to understand learner's needs and perform more accurately. By increasing motivation, facilitating acquisition of basic skills, promoting inquiry and exploration and preparing individuals for the technology-driven world. Virtual University of Pakistan promoted to government to prepare policy on IT. Then government has executed a programme of IT training in 26, March 2002 covering around 25,000 teachers who are from different parts of school. This project has taken with assistance of UNDP. In order to successful utilization of ICT in education then there is essential criteria to pursue certain long and short run objectives for development of ICT. It can be explained in following points.

- ✓ To build the physical infrastructure such as computer networks and rooms in schools, to ensure connectivity, and to provide access to various database and resources for teaching and learning activities.
- ✓ To develop educational software that uses ICT as a tool to aid innovative thinking problem- solving and processing skills
- ✓ To improve educational management by designing student, teacher and administrative database.

To achieve above objectives, South Asian countries like India, Sri Lanka and Pakistan have taken different kind of programmes. Let us start with Inida, in June 2003, the Government of India executed a programme called "VidayaVahini", purpose of this programme is to facilitate Internet access, an online library, academic service and web casting across 60,000 schools financed by it. Benefit of this programme gained by states like Madhya Pradesh, Andra Pradesh and Goa etc., Karnataka state has launched the programme called Yuva.com and the main purpose of this programme to provide basic computer skills through subsidized fees to every

unemployed person who passed out at least 10<sup>th</sup> standard. Ministry of Education, Government of Sri Lanka has started to conduct developing training centers, at 800 selected schools. At the same time, it also included IT studies as an optional subject for the General Certificate of Education (GCE). Pakistan also has made progress in developing the infrastructure through the Pakistan Education Network (PEN) initiative, at the cost of US\$ 5.18 million, to provide connectivity across universities, secondary and primary schools. PEN is a major ICT infrastructure project being administered by the Higher Education Commission- the federal government's regulatory agency for universities. The PEN initiative will utilize exiting telecommunications infrastructure, the recently launched and placed net works and servers, to ensure connectivity across 60 universities initially and eventually, thousands of secondary and primary schools. It has a 155MB optical fiber backbone, and was launched in early 2003.

### **5.3.2: Distance Education**

Not only ICT having significant role in the formal education but also have vital role in distance as well as non-formal education. According to the Human Development report 2005 reveals that South Asian countries have very low rate of Education Index (0.58) as compare to other countries except Sub-Saharan Africa. In fact, it is less than thousand of a child's entire lifetime. Fewer than half of primary school-age children are enrolled in school and more than two-thirds of those who do enroll fail to complete three years of schooling. While it will take massive efforts to change this situation as an interim measure, ICT can be employed in formal as well as informal settings to deliver essential knowledge and information. ICT-based distance education has been used not only to overcome from above consequence but also to over come from time, space and geographic restrictions.

In case of Distance and informal education, Pakistan has provided distance education to encounter adult illiteracy in rural areas. With help of NGOs, it has initiated training and capacity building for mid-career in the social sector. Another major project for underprivileged pre-schoolers is based on *Sesam Street*, produced by the US-based Children's Television Workshop, the project has taught children concepts such as numeracy, communication and social awareness etc. In case of Sri Lanka has adoption of distance education in 1997. After this, with help of University of Colombo, School of Computing and Singapore Informatics began to introduce

web-based distance education in professional courses. In 1984, India has launched the programme called 'the Countrywide Classroom for combating with traditional compartmentalized system. It has under supervision of Union Grants Commission (UGC). Then UGC used the Indian National Satellite (INSAT) system to telecast education via Doordarshan as well as audio system. At present, 17 autonomous media centers functioning under decentralized mode and these centers provided more than 60,000 educational programmes in almost all subjects. The countrywide classroom reaches out to four million viewers a day for an average programme. However, distance learning in both formal and non-formal environments has helped to raise the quality of education and contributed to economic and social development in most countries where ICT implemented effectively.

#### **5.4: Assurance of better Health**

Ailment is one of big obstacle for the socio-economic development of developing countries especially in South Asian countries. A proverb called as 'Health is Wealth' is became all time truth in the modern world. HIV/AIDS, Malnutrition, Cancer and other uncontrollable ailments are major barrier to development of these countries. Technical interventions must focus on prevention via means such as immunization and the launch of public health campaigns as well as on treatment delivered through a strengthened basic healthcare system. ICTs can help these efforts by improving the effectiveness of health promotion and disease prevention programmes as well as facilitating health-service delivery. Before adoption of any technology in a country, there will be curious to know the return of that particular technology like ICT. Here broadly some points discussed which are helps to ICT in assuring better health or encounter with sever ailments. These points recommended by ICT task force under UNDP.

- a) Responding to ailment epidemics via sharing lessons, treatment practices and guidelines with healthcare professionals, researcher and policy makers.
- b) Increasing access of rural caregivers to specialist support and remote diagnosis, and delivering healthcare services through tele-consultation to remote places.
- c) Enabling governments, NGOs and health establishment to increase access to health information through various forms of ICTs for example, radio or television programme and the Internet.

- d) Facilitating intra-government coordination on healthcare, enhancing government planning, increase health awareness and purveying disease prevention content across all actors and departments, particularly in the most crisis-affected countries.
- e) Enhancing the delivery of basic and in-service training for healthcare workers and serving training for health workers and serving as a medium of continuing education or life long learning for healthcare professionals to keep abreast of the latest knowledge.
- f) ICTs can be potentially used to increase the transparency and efficiency of governance, thus improving the availability and delivery of public health services.

With help of these advantages, ICT is providing services through following different types of channels.

*Telemedicine*, the potential of ICTs to traverse time and distance allows humans to interact with each other in new ways. Telemedicine helps to extend the scope and reach of clinical services, and allow for the capture and analysis of clinical data from multiple sources to assist in the formulation of improved treatment programmes. In rural communities, where access to specialized care is almost non-existent, patients can seek advice from distant specialists without leaving the community. Telemedicine has its own merits like it will help in reducing the need of transfer of patients from remote place and decrease the cost of health care etc. If we take country wise, Pakistan was established TelMedPak.com in April 1998. The main purpose of this launch is to interconnect hospitals and local doctors and update all kind of health news and articles. It was set up in Taxila and a small town 20km from Islamabad. One attractive thing is that this website having local language in maternal and child healthcare. In India, Apollo Telemedicine Enterprise Ltd has launched the telemedicine facility with help of IndianSpaceResearchCenter. One of the main attractiveness of Apollo telemedicine is covered and entered in to villages. This facility spread different remote places like Andaman and Nicobar, Tripura, Leh and Assam.

Information is vital in improving the health status of a population and preventing the spread of communicable diseases. ICT is very important in managing of such information, through database storage and retrieval of information. An interesting part of ICT for health project in India is ‘Community Access to Sustainable Health’ (CASH) which uses Personal Digital Assistants (PDAs) loaded with a database of patient records. It is also providing service with covering 4 states and around 100 Villages. Electronic Medical System (EMS) is another

kind of technology which is providing information more than four thousand patient records. This will help to the doctor to take next action related to a particular ailment.

Developing countries are suffering from lack of information and awareness and education. In this critical situation one can say that ICT play a significant role to encounter these obstacles. All kinds of health information can transfer to all levels of people with help of traditional ICTs like radio, video and television programmes. These are very less cost as well as very quick in providing information as compare to print booklets, news letters. ICT has another advantage for spreading health awareness in local language and it will also help full to illiterate those who especially from the village. At the same time ICT is playing a significant role in preventing diseases like HIV/AIDS, Malaria and Tuberculosis (TB). Nowadays these are becoming one of barrier to the economic development of South Asia countries. Unless and until avert these disease it is very difficult to develop in the entire sector. Therefore ICT is must and should; due it will create awareness especially to rural areas via effective communication technology. However, Precaution is only the factor can prevent this ailment and including India other countries started several programmes. In India, Saathi (Solidarity and Action Against the HIV Infection in India) is an organization that seeks to disseminate research, training and funding-related information on a real-time to those with limited access to libraries and the Internet. It is also collaborated with AIDS-India e-forum to disseminate India-relevant information on a daily basis.

### **5.5: Enhancement of Gender Equality**

Gender bias is word will create huge discussion and debate in the world among different kinds of people. Because it is one of the adverse effect to the society which will put down the one race of generation by pull up another race (gender). In this context, South Asian countries are very far behind in enhancing gender equality. For this we may make several social, culture and historical reasons. In turn, time has changes the entire situation while world moving towards modern society. On contrary, economic growth of a country need not necessarily generate improvements in the socio-economic status of women. With referring to this, ICT is a fast and accurate mechanism in removing gender bias. For empowerment of women ICT has its own advantage. That can be seen as follows.

- a) Directly, through the agency of the affected women themselves, who exploit the benefits of the technology to improve their status.
- b) Indirectly, by those who are exploiting the technology to improve the delivery of services to women, to increase awareness about the status of women and to advance their advocacy.

In South Asian region, ICT is assuring women to participate in e-commerce, distance education and e-governance. Thereby women can overcome socio-economic and cultural barriers. India, Sri Lanka and Pakistan are started to implement different programmes for providing platform women in ICT. The Siyath Foundation in Sri Lanka provides information to women at the grass roots level by collecting information from the internet, translating in to local language and distributing via fax. Along this, the Center for Women's Research (CENWOR) has launched a Women Electronic Information Network, which consists of online training to women. Similarly, Pakistan initiated programme like Sustainable Development Networking Programme (SNDP). Apart from the above facility, objective of the programme is to assist women who can overcome fear of technology. In India, under the supervision of the National Institute of Agricultural Extension Management (MAAGE) provides data base information to the women who are involved in the agriculture.

### **5.6: Ensuring Environmental Sustainability**

Pollution of environment is becoming worst day by day, due to rapid industrialization and modernization especially in the developing countries. For preventing pollution, there is huge debate are going on in international level. Another task is transform or creating awareness about environment sustainability to each people of different countries. ICT can do this task with help of GIS technique. GIS will provide database relating to what is the situation of forest land, animals with respect to country's geographical structure. By knowing these things government can easily take policies. According to Berkhout and Hertin ICT will give the good service to the production process, product and distribution in different meaning like Dematerialization<sup>\*</sup>, Virtualization<sup>\*\*</sup> and Demobilization<sup>\*\*\*</sup>. For example, predicting the future production of agriculture commodities. It can be done with collection of database related to existence of respective irrigation channels or dams. GIS was used for the rehabilitation of the water distribution system between water zones of Mizpur in Uttar Pradesh in India. In Sri Lanka GIS has used to detection

of change in the forest cover. The result of GIS showed that after four year of period 1.2 per cent of area become deforested.

## **VI. Potential Emergence of India in ICT sector**

India is emerging as potentially in ICT as compare to other South Asian countries like Pakistan, Sri Lanka and Bangladesh etc. This potentiality is providing leadership to India in the South Asian region especially in ICT sector. For supporting to this statement there are few indicator are there. Namely Employment, Output, Export, Revenue etc. If we take in terms of employment opportunities to work in the IT sector has been increased from 4500 in 1999-00 to 107200 in 2001-02. At the same time, revenue of the IT services also raised in robust manner. Revenue from IT service has been increased from 24 billion rupees in 1999-00 to 71 billion rupees in 2001-02. Here we see that within three to four year there was 50 billion rupees of revenue gained from the IT sector. This much of revenue collection cannot imagine non other than IT service or ICT sector.

An estimates made by the Nation Association of Software and Service Companies (NASSCOM) suggest that the share of IT exports increased from the 14 per

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\*getting more output for less resource input, \*\*the substitution of information goods of tangible goods, \*\*\*the substitution of communication.

cent in 1999-00 to 19 per cent in 2001-02. If we consider in terms of dollar India's IT exports has increased from 0.25 billion dollar in 1990-91 to 8.04 billion dollar in 2001-02. Obviously, there is eight fold increased in the IT exports. (C.P. Chandrashekar 2005). Last but not least, there is impressive increase in the ratio of IT sector output to the total GDP. It was 0.38 per cent in 1991-92 but it has increased to 3.00 per cent in 2001-02. From these tips we can make out that India has all qualities to become Leader in ICT in South Asia region as well in the world.

## **VII. Challenges to be confronted to ICT**

As we seen different kinds of programmes and projects to implementing ICT to solve the socio-economic problems. At the same time how ICT has diffused among these countries. However, there are well defined challenges faced by these countries. These are discussed in detail.

- The benefits of applying ICTs in health care are constrained by limited human and institutional capacities. Common to most poor developing countries. There is a large gap in basic infrastructure availability. The ability and willingness of health workers and other to make use of the opportunities, the availability of relevant and localized digital content, government regulations and policies and ICT sustainability.
- There is lack of computer skills which has prevented many health care professionals from harnessing the potential of ICTs. Inertia and the fear of new technologies have also prevented many from utilizing of ICTs.
- These countries main challenge is that information economy function mainly in English. While a majority of the total global online population comes from non-English speaking areas. 68.3 per cent web pages are written in English. Here, each countries government should take action either invest on development of local language or invest on developing English skills among the people.
- The digital revolution has created a dilemma for less educated on the one hand, it creates new and better jobs but, on the other end it raises the bar on high demand skills which they do not possess.
- In the part of education, main challenge of ICT is lack of effective promotion to create awareness, limited transmission, lack of videotapes which can increase to reach and lack of telecast in other language apart from English and National language of respective country.
- Another challenge is as compare to developed countries. Developing countries has limited resource, inequality, inefficiency. Because of this ICT lagging behind in developed countries.
- In terms of gender equality in South Asian region. Women or girls internet users quantity constitute less than one per cent of the population. And Most of women internet users belong to the predominantly urban, educated elite rather than rural and poor family women.
- Women from rural area facing so many challenges as compare to urban women to embrace the benefits of utilizing ICTs. Because of socio-cultural notion of male superiority and hierarchy, low level of literacy and lack of computer education.
- Women in many developing countries have put themselves to different responsibilities like take care of children, husband and other family members. Especially rural women have lack

of time to learn vocational and formal education. But where she can only have little time to spend on ICTs.

- With respect to environment sustainability. ICT are used mainly for environment monitoring and less alteration is given to risk and vulnerability analysis.
- The Role of NGOs and private organization in ICT promotion for environmental sustainability remain weak. Because most of ICT tools are governed by state controlled organizations.
- Last but not least. Lack of Public awareness, remains weak in the environment sustainability area. The shortage of budget results in ICT measures being focused only on major environment problems.

### **VIII. Policy Implications**

Every challenge or consequence has its own kind of resolution. Similarly, in the part of ICT in developing countries also can found many challenges. To overcome these consequences and to enhance success then there is need policy inference as resolution. Any country in the world especially developing countries should realize that execution of policy implications effectively is one of the major secrete of success. However with reference to South Asian countries following some policy implications are mentioned.

- ✓ Technological intervention should be supplemented by strong content provision and must be combined with well planned development programme.
- ✓ To provide good infrastructure facility for rural where people can exploit the ICT sector more then there is possibilities for to overcome socio-economic obstacles.
- ✓ Efforts should be made to co-ordinate viable ICT for poverty alleviation programmes across agencies in the spirit of networking. At the same time, the small, spontaneous, but fragmented initiatives among private agencies. Another thing is NGOs are not only be encouraged and facilitated but also mainstreamed and coordinated.
- ✓ Access to ICTs enhances traditional or formal education system and these countries should concentrate on those technologies that compensate for the factors that are not available.

- ✓ There is need to focus on technological alternatives that at low cost, bring the imagination and creativity of a few excellent teachers to student. Another point is to stress on how to fund, implement and maintain the educational part of ICT networks for reaching majority of poor, uneducated rural populace.
- ✓ There should be an allocation of financial resources on the national budget to support strategies to increase women's participation in the information economy, including funding for NGOs to strengthen opportunities for women's empowerment through ICTs.
- ✓ In ordered to realize girls participation there is essential to add ICT education as part of school curricula and be based on gender equality. However, proactive role of state on improving socio-economic status of women so that they can embrace ICT technologies and reap the vast benefits that they afford.
- ✓ Efforts should be made on educating health professionals on the use of ICTs and providing them with necessary connectivity rather that to the population at large.
- ✓ There is need for sufficient policy and law which can help these countries to cop with the process by adapting ICT. In this ways it will allow them to utilize the benefits of ICT and minimizing its adverse consequence.

## **IX. Conclusion**

Information and communication Technology has to be remember for long period of time. Because ICT emerged as quickly as compare to other technology and it is reaching at peak level around the world. Every day there is a different kind of innovations taking place in the ICT sector. Diffusion and impact of ICT in South Asian countries, reveals that there is lot of effective efforts needed complete utilization of ICT for socio economic development. There is one major thing is to conclude that still there is lack of cooperation among the neighbourhood countries. It will adversely impact on the development of the ICT to encounter problems like poverty, illiteracy, health problems and so on. Another major issue can be take from the study is role of R&D is essential factor for ICT. Even we can see a big gap between R&D and ICT. It means quality and quantity of R&D projects and programmes are depleted manner. Standardized and Deterministic programmes are only can enhance the usefulness of ICT. There is more political will and cooperative method like Public and Private Partnerships (PPP) are needed to compete with the developed countries. However, people from developing countries are habituated with

traditional values and ethics. It will create fear to accept any technology or innovation. Unless and until any technology understandable to lay man then only ICT or any technology will knock the door of people mind. International Institutions like UNESCO putting huge efforts to implement ICT for the resolution of socio-economic problems then only ICT could be appreciable.

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