THE ROLE OF ICT IN POVERTY REDUCTION

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"There is an on-going view that IT is totally irrelevant for the poor who are generally illiterate; IT is too expensive for them to reach out to; the poor don't need fancy IT, they need food. These are the voices of the sceptics. ... Now in three years there are more than 5000 Telephone Ladies in Bangladesh villages doing roaring business selling telephone service."

(Mohammed Yunus 2001)

I Introduction

The Issues and the Argument

Information and Communication Technology (ICT) plays a major role in all aspects of national life: in politics, in economic life, as well as in social and cultural development. It is rapidly transforming our lives, the way we do business, access information and services, communicate with each other and entertain ourselves. It fuels the global economy. It also relates to human rights, helping, at best, to support freedom of expression and right to information according to the Article 19 of the Universal Declaration of Human Rights.

Extreme poverty, experienced by about 1.2 billion people is considered by many to be the worst human right violation in the world. Consequently, the global development community has endorsed in the Millennium Development Goals its commitment to halving the number of people living under one dollar a day by 2015. (**www.un/org/millenniumgoals/**; **www.undp.org/mdg/**, 22.1.2003).

What is the role of the ICT in poverty reduction? Does ICT create new divisions between rich and poor or does it intensify existing socio-economic divides? Does it have any direct role in reducing poverty or is

it just a luxury that the poor can ill afford? There are two opposing "opinion camps": those that consider ICT to be the panacea for poverty reduction and those that claim that ICT has no reasonable role in poverty reduction as long as the basic needs of the poor are not met. The argument in this paper falls somewhere in between. It is argued that the ICT, if supported with the right policies and with cross-cutting and holistic approaches, will complement and strengthen other multisectoral efforts that are required for poverty reduction, including those meeting basic needs.

Definition of ICT

Before discussing the issues, it is necessary to define, what is meant by the ICT. There are many definitions. OECD's definition comes handy, as it makes a useful distinction between the manufacturing and service dimensions of the ICT. In 1998 OECD member countries agreed to define the ICT sector as a combination of manufacturing and services industries that capture, transmit and display data and information electronically. The important factor in this broad definition is that, as it breaks the traditional dichotomy between manufacturing and services, activities producing and distributing ICT products can be found everywhere in the economy. (OECD 2002). The definition, thus, paves way for understanding the multi-dimensionality of the ICT and its applicapability in helping reduce poverty across various sectors.

The manufacturing sector of ICT hardware and software contributes to the economic growth and creates employment in countries like China, Malaysia and Mexico. India, on the other hand, has been a beneficiary of global software outsourcing, achieving spectacular growth in this sector. India exports software to 95 countries around the world and serves as a major outsourcing hub. The main market for the Indian software has been the USA, and to a lesser degree Europe. 185 Fortune 500 companies outsourced their software requirements in India alone. ICT industry generated $7.7 billion in 1999 creating 180,000 jobs in India in 1998. (UNDP 2001b). Since these sectors rarely create direct employment for the very poor, who are mostly uneducated, we will review mainly the service role of the ICT.

The Divide

The role of the ICT in the so-called digital divide has been hotly debated: Whether it exists and if it exists is it narrowing? What is its relationship to poverty and does it reinforce existing divisions between the rich and the poor?

No one can deny the fact that the digital divide exists, although there has been progress in reducing some of the gaps. Judging by the ratio of Internet hosts and users in the regions, Africa is still lacking behind other regions as shown in table 1.

Table 1: Internet Host and Users as well as Number of PCs per 10,000 Inhabitants in 2001

Region	Internet Hosts	Internet Users	Estimated PCs
Americas	1340.96	2181.85	26.91
Oceania	876.38	2720.49	39.39
Europe	191.43	1840.02	18.32
Asia	29.23	434.12	3.33
Africa	3.45	85.09	1.06

Source: ITU 2002b

According to the regional statistics on mobile penetration (table 2) South-Asia and Sub-Saharan Africa were the two laggards in 2001.

Table 2: Mobile Phones per 1000 People in 2001

Region	Mobile Phones
USA and Canada	341.25
Latin America and Caribbean	122.53
Europe and Central Asia	92.00
East Asia and the Pacific	69.76
Middle East and North Africa	29.97
Sub-Saharan Africa	17.42
South Asia	3.38

Source: www.ecomlink.org/E_Incubator/Indicators_Detail.asp?CategoryID=002&Tabl

There are, however, wide differences within the regions and sub regions. In Europe the penetration ratios vary widely from Finland's

720.37 mobile phones per 1000 people compared with 7.61 in Albania. In East-Asia we find Hong Kong, China with the ratio of 809.16 mobile phones against 2.33 in Lao PDR. In the Middle East and North-Africa we have United Arab Emirates with 548.02 against the ratio of 1.74 in Yemen Yemen Republic. The divide follows roughly the development status of the sub regions and countries. The average penetration ratio for the high-income countries was 780.32 as against 57.63 in lower middle-income countries and 5.36 in low-income countries, the world average being 123.14. There are exceptions, however, and one them relates to the low-income island countries, which tend to have comparatively higher rates of mobile phones within their region. This is the case, for example with Maldives (28.3), Mauritius (150.81) and Cape Verde (45.37), but not with Cuba (0.58).

There are also links between the digital divide and the human development indicators. According to Flor (2001), this is the case with South-East Asia regarding the literacy levels. UNDP's human poverty index (see table 3) is also revealing. The higher the human poverty index, the lower the number of ISPs, telephone lines, PCs and TV sets per 1000 persons. The higher the value of ICT indicators (as in the case of Singapore, Brunei and Malaysia), the lower the poverty rank. (Flor 2001).

Table 3: Internet Penetration Compared with Other Indicators in South-East Asia

Country	Internet Penetration	Adult Literacy %	Female Adult Literacy %	Daily Newspapers % of Population (1996)	Poverty Rank
Singapore	29.9	92.1	88.0	32.4	..
Malaysia	15.9	87	82.8	16.3	13
Thailand	3.8	95.3	93.5	6.4	21

Philippines	2.6	95.1	94.9	8.2	23
Indonesia	0.9	86.3	81.3	2.3	38
Vietnam	0.25	93.1	91.0	0.4	45
Lao PDR	0.1	47.3	31.7	0,4	66
Cambodia	0.05	68.2	57.7	0.2	78
Source: ITU 2002 and UNDP 2001)					

A digital divide also exists within countries: between economically more and less-developed regions, between urban and rural areas, between poor and the well to do, between the educated and the illiterates, between men and women, and between the young and the old. (ITU 2002c). We can also expect a divide between a majority population and indigenous ethnic minorities, which have traditionally been excluded from almost all development. According to ITU the digital divide is a result of socio-economic disparities, and thus it is little different from other income, health and education divides, linked to poverty. (Ibid). The digital divide, therefore, is often just a symptom of a much more profound and longstanding economic and social division within and between societies, and which existed prior to the ICT revolution.

There is also a digital divide between sectors. In Thailand and the Philippines, the business sector is fast catching up with its counterparts in Singapore, but the educational sector is lagging far behind. At the tail end of the ICT utilization spectrum are the agricultural and rural development sectors, with the least number of ICT users, applications and solutions, and with most of 'the information poor'. (Flor 2001).

The divide in access to ICTs is shrinking. Developing nations have raised their share of the world's Internet users from 2 per cent in 1991 to 23 per cent in 2001. At the same time the nature of divide is shifting from basic to advanced communications, and from quantity to quality. (ITU 2002c).

Many countries, alarmed about the digital divide, have started to address the problem and are making progress in narrowing some of the divisions and gaps. In November 2002 India added more mobile phone customers than ever before, bringing the total number of mobile users to almost 10 million. Although it has some of the lowest mobile phone prices in the world, only one in 100 Indians uses a mobile phone, whereas in China it is one in seven. China recently passed the US as the largest mobile market in the world. (CNN 13.12.2002). Russia comes third.

Access to Internet in China has grown exponentially since the country established its first connection in 1993. Marketing firms predict that China (PRC) will overtake Japan as the leading Asian country in Internet users by 2004. China has also witnessed a rapid increase in domain registrations and web sites— roughly 20 percent per quarter according to some estimates. 17 million people had access to the web by the end of 2000 (Kalathil and Boas 2001) and there were 59 million Internet users in China at the end of 2001 (CNN 23.1.2003). There were around 38.6 million GSM users in PRC in December 2002. (CNN 23.1.2003).

There are also differences in the level of hardware and software capabilities. Philippines, for instance, is considered to be the second largest exporter of ICT professionals and software developers next to India. Yet, it has hardly caught up with broadband and wireless technologies. (Flor 2001).

Increasingly, ICT is being used as a tool of development. Among the developing countries at least India, Jamaica and South Africa have given a high priority to policies aimed at promoting the use of ICTs for development.

The Many Dimensions of Poverty

The question is, whether economic growth and globalisation – together with the ICTs - alone will reduce poverty. According to recent economic research the relationship between growth and poverty is rather complex, and depends largely on the existing inequalities (such as illiteracy and land ownership) and initial conditions that favour or discourage the distributional effects of growth. (Ravallion and Datt 1999). Nor is globalisation necessarily a solution to high levels of poverty and inequality. According to Birdsall (2002) the global economy can be stacked against the poor. In particular, the countries that are caught in an "institutional poverty trap" will not necessarily benefit from a healthy global market. The same applies to the regions. A study of the impact of globalisation on poverty in Vietnam (Thoburn and Jones 2002) concluded that although globalisation did have clear economic benefits for Vietnam on the whole and helped to reduce poverty, the gains were less in the Mekong Delta region where there are inequalities in the pattern of land distribution. Research by Wider (2001) endorses such conclusions.

Economic growth is necessary but not sufficient when it comes to poverty reduction. We cannot pre-empt the role of economic growth in creating necessary resources for social development, but complementary social and environmental policies are also required. If poor people do not have access to basic education, how will they take advantage of employment and income opportunities created by economic growth? If there is discrimination and social exclusion, how will the discriminated and excluded people take advantage of the expanded economic activities and share the benefits of the economic growth?

Poverty stems from situations where gross inequality in the ownership of assets persists because of vested interests and entrenched power structures. Markets can provoke collusions that block the potential benefits of competition to the poor and the disadvantaged easily fall outside distributional coalitions. Market, thus, can be biased in favor of the more affluent and powerful social groups and against poor and

disadvantaged groups. (Leyshon and Thrift 1997). Such biased coalitions are considered to be the most significant cause of inequality within societies. The level of the playing field is not even for the poor. Even under otherwise ideal market conditions, the poor may end up paying more and earning less, and face a number of constraints to an extent not experienced by others. (Bowles 1999). At the national as well as local levels economic gains may be captured by elites who may form patronage and clientele networks for the redistribution of benefits. The lack of good governance, together with inadequate legislation or its inadequate enforcement may further reinforce such capture. (Kelles-Viitanen 1999).

Poor people often lack essential assets such as good productive resources and capital. Their employment situation is insecure and fragile, and their incomes seasonal and meagre. They live in remote, unhygienic and resource-poor areas, in distant villages and in appalling slums. Their poverty results from lack of incomes, poor health and lack of education, lack of social safety nets, and discrimination. They also lack information, and suffer from poor government services and corruption. Assistance may also not reach them because of the lack of political will, poor governance and corruption, and inappropriate public policies and programs. (World Bank 2001a).

Poverty, thus, is a highly complex socio-economic problem, that needs to be tackled concurrently in various sectors in order to untangle the 'Gordian knot' of poverty. It is the synergy of combined efforts that produces the most sustainable results. (Asian Development Bank 1999).

2. ICT's Role in Various Poverty 'Sectors'

ICT in Employment and Income generation

ICT manufacturing sector can provide some direct employment for the poor, although their educational and skill levels are usually too low. There are better employment prospects for them in the service sector. Grameen Bank in Bangladesh is a good example of this. With the

exception of China and the Philippines most of the manufacturing is also taking place in more developed countries such as Malaysia or Taiwan. (Jha 2002) Although an export focus can produce significant national economic benefits, these gains do not automatically translate into progress on broader development goals. However, using ICT in pursuit of development goals allows countries to achieve a wide diffusion of benefits, which will benefit broad-based economic growth, as well. (UNDP 2001 b).

Grameen Bank is best known as a micro-credit institution and an NGO, but less for its pioneering ICT work among the poor. It started with the mobile telephone program called Grameen Phone and has become the largest mobile operator in Bangladesh, having 70 per cent of market share. It has lately expanded to other ICT sectors, becoming the largest Internet Service provider. Grameen Communication has set up Internet kiosks in villages in Bangladesh and Grameen Software and Grameen Star Education are franchising IT education all over Bangladesh to build human resource base for the growth of IT businesses. Simple e-healthcare services are also being tried out in collaboration with Hewlett Packard and NEC. (Yunus 2001)

ICT technologies can be used to increase efficiency, competitiveness and market access for developing country firms. An InfoDev-sponsored organization called People Ink, for example, has established an e-commerce programme allowing local artisans in developing countries to bypass middlemen and market their products directly to first world customers. Its success is based on the business development applications that were grounded in local language and relevant content. (ITU: New Technologies for Rural Applications).

In Kenya, the Naushad Trading Company (**http://www.ntclimited.com**, 22.1.2003), which sells local wood-carvings, pottery, and baskets, has seen revenue grow from USD 10,000 to over USD 2 million in the two years since it went online. Consumers and shopkeepers can access constantly updated color pictures of N T Limited's product line, place orders, and make inquiries of other types of handicrafts. (World Bank 2001a).

In Tanzania, the government has embarked upon improving the business environment through revision of regulatory and tax regimes to stimulate private sector-led growth, and developing entrepreneurial business management skills of small business associations. Tanzania has placed a short-term emphasis on the urgent need to develop ICT skills, rather than just enhance the primary education system. (UNDP 2001 b).

Although such businesses are unlikely to be in the hands of the very poor, when profitable they can provide –on site or outsourced - employment to the very poor. Outsourcing is already very common in non-ICT areas among the poor, and many poor women work for merchants or other middlemen as home workers, albeit with very low wages or piece-rates. (Singh and Kelles-Viitanen 1987).

ICT can also change and invigorate old occupations, and add new public services, as with the postmen in India. In addition to carrying letters, they can also provide mobile phone services to rural people, including poor people, as shown in the example below.

Box 1: Example on Changing Occupations with the Mobile Phones

A large army of postmen will take mobile phones with their letter delivery and reach out as mobile Officer to villagers across the length and breadth of India. Bharat Sanchar Nigam Ltd (BSNL), the government owned telecom incumbent, will convert all of the 170,000 village post offices into mobile centers. As each post office serves three to four villages, the entire country of one billion plus people will be covered by telecom access in this imaginative scheme. The e scheme will make use of WLL (wireless in local loop) Technology, with a mobile handset that will show the bill for the call on the screen that the postman renamed Gram Sanchar Sevak will carry with him.

(Source: Convergence Plus Journal, 2 January 2003)

ICT can play a major role in enhancing the activities of the poor and increasing their productivity. It can help to increase access to market information or lower transaction costs of poor farmers and traders.

Poor people are often unaware of their rights, entitlements and the availability of various government schemes and extension services.

Through infokiosks or even with the help of mobile phones (as above) farmers can access information on market prices or on extension services. Workers can get information on available jobs and minimum wages. Timing is often crucial when it comes to the sale of produce. Such interventions, however, can only be successful when accompanied by other supporting infrastructure such as access roads, storage facilities and competitive markets, including the global market.

ICTs can boost access to many other services, as described in box 2. In a tribal district in Madhya Pradesh, in India the most commonly used services related to various grievances, market information and land-records.

Box 2: Successful Information Network

The 'Gyandoot' community network, aimed at creating a |cost effective, replicable, economically self-reliant model for taking benefits of Information Technology to the rural population, is an intranet network using Wireless in Local Loop (WLL) technology to set up in 5 blocks with 21 kiosks, each catering to about 15-20 villages in tribal Dhar district n Madhya Pradesh. The success is largely due to targeting the information interest of the people. The examples are: rates of agriculture produce, land record rights, computer training, caste certificates, online public grievance redressal, health services, e-mail, rural e-auction, matrimonial alliances, information on government programmes, information for children, online employment exchange, availability of applications for jobs, local weather report, e-news papers etc. Between January 2000 and June 200l, 68500 villagers used various services. The most commonly used services were grievance redressals (41%), market rates (25%), land-records (20%). Interestingly, one out every six users of the network was illiterate with no knowledge of reading or writing. It is a disappointment that only 13 % of users are women.

(Source: Samiullah and Rao 2002)

It is important that women, who in many countries work as farmers, are targeted by the ICT services. It has been known, for long, that women are particularly disadvantaged, when it comes to access for rural extension services, and technical, agricultural and market information. Firstly, their low educational status and high illiteracy incapacitates them form benefiting from and tapping new information and improved practices. Secondly, they lack a socially accepted decision-making in production.

Thirdly, agricultural and other field-based extension officers, who are usually men, mainly consult other men. Fourthly, women are less mobile, more culturally constrained and often too overburdened with various chores to be able to participate in technical trainings. In many countries, women, who work in the informal sector lack market information as well. (Kelles-Viitanen 1997).

ICTs can also play a major role in relation to the natural disasters that are common in low-income countries. For example, between June and December 1996, a total of 1,689 people died in Andhra Pradesh (AP) in India, in heavy rains, floods, and cyclones. The total economic loss caused by the 1996 disasters in AP was estimated at US$2 billion. The following year, a World Bank backed project was implemented, designed to help set up a hazard management program in high- risk areas and improve warning capacity. Both elements invoked a significant ICT component—especially in cyclone warning, communication and response, awareness raising, education and community involvement in hazard reduction activities. (World Bank 2001).

ICT can also play a major role in helping to monitor food security related issues (weather, droughts, crop failures, pests etc.), and to inform government on impending food scarcities and famines. According to Amartya Sen (1981) and Jean Dréze (1999) information plays a key role in preventing food scarcities from turning into famines.

ICT in Education and Health Programs

There are many success examples of the role of the ICTs in promoting education of the poor. In Brazil's urban slums an ICT facilitated educational program not only improved the skills of the poor and the employability of the youth, but it also in many ways transformed their lives.

Box 3: ICT Application on Education

In Brazil's urban slums, the Committee to Democratise Information Technology (CDI) has created 110 sustainable and self-managed community-based "Computer Science and Citizenship Schools," using recycled technology, volunteer assistance, and very limited funds. CDI schools train more than 25,000 young students per year in ICT skills that give them better opportunities for jobs, education, and life changes. CDI also provides social education on human rights, non-violence, environmental issues, health and sexuality. CDI cites many cases in which participants have developed renewed interest in formal schooling, resisted lure to join drug gangs, and greatly increased their self-esteem.

(Source: World Bank 2001)

There are also many examples of how ICT has improved health programs, one of them took place in Ginnack, a remote island on the Gambia River. Nurses used a digital camera to record patients' symptoms, sending pictures electronically for diagnosis by a local doctor in a nearby town, or abroad to get a specialist's view. (UNDP 2001).

Another ICT based project in West Africa helped to erase river blindness as described below.

Box 4: ICT Applications in Health Programs

Networked computers have played a vital role in controlling Onchocerciasis, or river blindness, in West Africa. Data collected by sensors along 50,000 km of rivers were fed into computers by local inhabitants. From the computers the information was beamed to a network of entomologists by satellite radio, and used to calculate the optimum time to spray against disease-carrying blackfly. River blindness has now been eliminated in seven countries, protecting 30 million rural people from the disease and opening up 25 million hectares of land to settlement and cultivation.

(Source: World Bank 2001)

ICT in Promoting Democracy

According to the Okinawa Charter on Global Information Society "everyone, everywhere should be enabled to participate in and one should not be excluded from the benefits of the global information society. The resilience of the society depends on democratic values that foster human

development such as the free flow of information and knowledge, mutual tolerance, and respect for diversity."

ICT can, indeed, play a major role in supporting a culture of democracy, democratic processes and civic values that uphold a democratic system. Interventions on the so-called ' e-democracy' usually involve processes on electronic interaction between Government and the citizens. The aim is to i) provide for citizens access to information and knowledge about the political process, services and available choices, and ii) facilitate transformation of passive information access to active citizen participation by informing, representing, encouraging to vote, consulting and involving the citizens. ICT can have a major role in 1) creating a more well-informed and active citizenship; 2) undermining closed and undemocratic regimes; and 3) supporting the watchdog role of citizen groups. (Walch in :**http://www.opendemocracy.net/debates/article.jsp?id** 24.1.2003)

There are also other views. Some argue that the Internet can also become a tool for disruption, undermining existing organisations, and promoting fragmentation of society into various disagreeing groups. (see Crabtree in **www.opendemocracy.net/debates/article.jsp?id** 24.1.2003). Another debate centers on role of the ICT in controlling freedom of expression, and promoting crime and vice. This is an important subject that merits a longer discussion.

Participation by the poor in development that affects them is very important. Often the poor know their problems, but they lack knowledge of the wider socio-economic context of their poverty. They also lack information on various solutions to improve their situations. This is where technical experts can help the poor. Experts, too will benefit of having a better understanding of the living and working conditions of the poor people and hearing their views.

In Honduras, the poor used ICT to prevent the destruction of their habitat. An organization of small-scale fishermen sent Congress a video of the illegal destruction of their mangroves by politically powerful commercial farmers, raising awareness of and protesting against the loss of their livelihoods and habitat. As a result, in the future, there will be virtual

committee rooms for the citizens to testify on various issues. (UNDP 2001).

ICT in Governance

The quality of governance is critical to poverty reduction. Good governance facilitates pro-poor policies as well as sound macroeconomic management. It ensures the transparent use of public funds, encourages growth of the private sector, promotes effective delivery of public services, and helps to establish the rule of law.

Public sector inefficiency, corruption, and waste leave insufficient resources to support public services and anti-poverty programs. Since effective and efficient delivery of basic services by the public sector matters most to the poor, weak governance hurts them disproportionately. Denial of basic services to the poor is not just a matter of lack of investment. Often, it results from i) institutional structures that lack accountability, ii) domination by local elites and the well to do, iii) widespread corruption, iv) culturally and socially determined inequality, and v) lack of participation by the poor. (Asian Development Bank 2002).

ICT can facilitate speedy, transparent, accountable, efficient and effective interaction between the public, citizens, business and other agencies. This not only promotes better administration and better business environment, but also saves money in costs of transactions in government operations (IICD 2001).

The lack of systematic and transparent recording and public documentation of government data that the poor need has a negative effect on development outcomes. This is the case, for example, with land records. As documented by Hernando de Soto (2000), even if the poor have lands, without records the capital is ‘dead’. Without land records as collateral, they cannot apply for loans, and often they cannot get assistance from government poverty alleviation programs intended for small farmers. (Warschauer 2003).

For the poor, getting access to even the most common type of government information or documentation can be a nightmare requiring multiple visits, waste of time and bribes. ICT, as described below, can be used to get rid of such malpractices and to speed processing of documents.

Box 5: Examples on ICT's role on Improving Governance

In Andhra Pradesh, India, networked computers have been used in the reform of processes to register deeds and stamp duties. Using traditional methods, this took 13 cumbersome steps in a highly opaque process that invited bureaucratic delay and corruption . It took from three to as many as 15 days—and the process involved the registration of over 120 million documents a year. Using a new networked system, the same task can be accomplished in just over two hours, with far less opportunity for graft. Again in Andhra Pradesh, a program to computerize the issuance of caste certificates, essential for obtaining government service vacancies and access to educational scholarships, managed to decrease the time for certificate issuance from 20 to 30 days to only 10 minutes.

(Source: World Bank 2001)

Top-down provision of information is not sufficient, without an opportunity for feed-back. Citizen feedback to government provides a check on bureaucratic abuse and corruption, alerts the government to citizen's needs and concerns, and gives citizens a sense of having a voice in society. (Ibid) ICT can assist people in monitoring development programs that they produce what they promise to do.

Box 9: Examples on the Feed-back Role of Information

A. When residents of a district in the poor desert state of Rajasthan heard of a road-building scheme, of the money spent on it and of the wages that were claimed to be paid to local hires, they demanded to see the payrolls and hear an account of where the money went. It turned out no road was built.

B. A pressure group in Rajasthan exposed corruption in government projects and forced the state Government to agree to make public all documents related to such projects at the village level, to allow citizens to make photocopies of them, and to punish those responsible for corruption.

C. The residents of a town heard on official radio that children were being immunised. They demanded form health officers details of the scheme, including how may children had been immunised and how much medicine was bought. They were told the local health board was not obliged to reveal any information.

(Source: South China Morning Post 4.9.2000)

Not all the experience has been successful. For example, a program established by the Indian National Informatics Centre to provide ICT support to local governments for the storage of land records and monitoring of Ministry of Agriculture programs, after 15 years of operation, made only marginal impacts. The task of changing administrative cultures, which would have been necessary for effective ICT processes, had never been properly tackled. (World Bank 2001).

ICT interventions have to be introduced together with a broader reform program. They cannot act as a substitute for such a reform. (Ibid). Free and fair flow of information is an exception rather than a rule in poor countries and public access to information can be systematically denied or restricted. (Skuse 2001). ICT interventions on governance, therefore, need to be accompanied with legislative reforms. Some developing countries have introduced such laws. Three states in India have passed laws on right to information while others have tried to enforce it in some form through executive instructions and guidelines. (Commonwealth Human Rights Initiative 2003). (Among the developed countries Sweden was the first to enact a Freedom of Information Law. The US is known to have the most open and transparent system of government (Ibid), while Finland is the least corrupt country in the world). Cyber legislation is also required to safeguard the privacy of citizens and to support paperless administration.

Other institutional reforms are required to address bureaucratic resistance and to increase the commitment to openness and transparency. At the same time capable institutions with effective policy frameworks and clear operating systems are required for smooth functioning of ICT based development.

III Broad based Poverty Reduction Program with Holistic ICT Approach

A comprehensive poverty reduction program is required to turn the vicious cycle of poverty into a virtuous cycle of well-being. It would need to include: i) sustainable and pro-poor growth with investments in both physical and social infrastructure; ii) inclusive social development programs that promote equity and empowerment of the poor; iii) efforts in

good governance with effective policies and institutions, efficient and accountable public sector management, and legal and judicial reform; and iv) efforts in promoting participatory decision-making. (ADB 2002).

Economic growth needs to be broad-based and pro-poor involving the sectors that are most important for poverty reduction. There cannot be a one-fit policy for all, but the most effective strategy needs to be worked out in each country taking into consideration historical trajectories and the socio-economic and political context of the country. Benefits of growth need to be distributed as evenly as possible, across the regions and social groups. Any strategy will not succeed if it bypasses geographic areas or sectors where the poor are concentrated, or if it fails to make intensive use of the unskilled labour of the poor. (Lustig 2002).

Government, market, civil society, and the community, all need to work together to create conditions that will enable the poor to overcome their poverty, build their physical, economic and social assets, improve their capabilities, safeguard their security and reduce their risks and vulnerability to various external shocks.

The role of ICT is catalytic in this complex task of poverty reduction by leveraging the effects on earnings opportunities, on educational and health services, on good governance and on promoting democracy. Since information exchange is part of nearly every element of the economy, the impact of improvements in the capacity for information exchange will depend critically on how the rest of the economy functions. This suggests the centrality of **a holistic approach** in evaluating the impact of ICT. For example, the impact of improved ICT access on farm earnings through increased knowledge of market prices will be muted if there are no roads to carry crops to markets, or there are no markets because of an unreformed agricultural sector. (World Bank 2001).

Any approach using ICT in the interest of poverty reduction has to be broad-based and tailored to various sectors and build inter-linkages. (Ibid). According to a study carried out in India, Jamaica and South Africa the effectiveness of ICT in combating poverty depends on i) complementarities with other local level poverty reduction and development initiatives, ii) responding to the local community needs, and

iii) involving stakeholders in applications development. (Millar and Mansell 1999)

Care should be taken to make sure that the novelty factor of the technology does not drive decisions regarding the most appropriate technology for poverty reduction. (Potashnik and Capper quoted by World Bank 2001). The goal of using ICT with marginalized groups, such as poor, is not only about overcoming the digital divide, but rather enforcing and furthering the process of social inclusion, which is required for transformation of the environment and social system that reproduces poverty. Technology can assist in this process, but efforts should not be just limited to it. (Warschauer 2002).

IV ICT Strategy

The various success cases, as described above, are possible only if the ICT infrastructure and an enabling policy environment have been put in place. It has been proposed (UNDP 2001 b) that strong linkages need to be established between direct ICT interventions and national-level programs that deploy ICT as an enabler in development. At the same time a strategic compact needs to be built upon old and new partnerships to redefine roles and responsibilities at the global, national and local levels. The global networked economy demonstrates that development strategies can no longer be pursued in isolation, but must be pursued within the global context, while simultaneously addressing the needs and opportunities emerging from the local context. (Ibid).

An enabling regulatory and policy environment is required for the ICT sector, including coherent national plans, that integrate ICT-based development. They should help to build national and regional Internet backbones and community access points; adopt enabling policies for telecommunications and electronic commerce; encourage the creation and dissemination of locally relevant content and applications that fit with the cultural and social context, reflecting the linguistic diversity; significantly expand education and training programs, both in general and with regard to ICT in particular; and help to create a facilitative environment and access to ICT for the civil society, private sector and government. (Drake

2001). ICT policy also needs to address connectivity, ICT governance, privacy, security, intellectual property, and resource mobilisation issues. Although each country would need to tailor a strategy best suited for its conditions, there are, according to the World Bank, also common principles that need to be included, such as effective separation of policy and regulatory functions. (World Bank 2002).

An enabling national climate is also a must. As reported by CNN (Mark Tully 13.1.2003) the success of IT sector in India –in contrast to other sectors- has been that "IT took off without the government noticing it and so escaped the licenses, permits, controls, and other bad habits our bureaucrats love." Clearly not all countries have escaped this. According to the Grameen Bank leader ICT will only gradually spread within some poor countries, because governments are keeping their doors shut to the private sector and continue with old-style public control over the telecommunication sector. (Yunus 2001).

According to the World Bank (2001) the experience with the African Internet Service Providers suggests that countries with a highly liberalized telecommunications network had costs of Internet access eight times lower than those with a completely closed market. According to the World Bank retail segment of the market needs to be liberalized with no prohibition of reseller activity, at least when it comes to phones. At the same time, it is worth noting that liberalisation does not always increase household access to telephones. This has been the case in Eastern Europe and Latin America. A wider policy reform is therefore required that includes a pro-poor ICT policy together with reforms in investment policy, education and special support to ICT provision in rural areas.

But the market alone may not be able to meet all socially and economically desirable objectives of the ICTs, and it will be the role of the government to safeguard access to the poor, even with targeted subsidies (Ibid).

Care needs to be taken to see that the ICT programs are not just technology-driven but respond to the needs of the poor, when it comes to content, language, skills, design, and price. It is important to address the sectors and areas that are of direct relevance to poverty reduction and

where the use of ICTs can make a difference. Local communities should be involved in the design of universal access programs through consultations, surveys and demand studies.

Hardware too could be developed in close consultation with the poor, and in line with the developing country conditions, responding to various constraints such as lack of mains energy supply or interrupted supply. Techniques such as voice mail translation of content, and icon-based telephones could be used. Such research and development already exists in developing countries. India and Indonesia are developing their own customized, low-cost IT terminals and devices. (ITU, Ibid). The Indian Institute of Science has invented an inexpensive Simputer, based on the Linux operating system to provide Internet and email access in local languages and with touch-screen functions. Future versions will have speech recognition and text-to-speech software for illiterate users. India, Brazil, Thailand and Niger have also developed software for illiterate users. (UNDP 2001). For such endeavours public financing is required, at least initially. According to the World Bank (2001) 81 percent of telecommunications investments in projects with private participation went to just ten developing countries in 1998, 52 percent of the investments were in Latin America, while less than 3 percent were in Sub-Saharan Africa during 1990-98.

In the long run, it is necessary to develop financing frameworks that attract private investment. As the Indian example cited earlier (on bringing down the mobile call rates) indicates, the private sector – with the right goals and accompanying policies – can be a friend of the poor.

It will be difficult to predict the future, not only regarding the kind of technologies that will emerge, but also regarding the reaction of the consumers: what they will adopt and for what purposes, and what they will reject. Increasingly, the technology needs to be developed in close consultation with the people, including the poor. There is a huge market to be tapped among the poor, if the design, content and price are right.

V Conclusion

It has been argued here that ICT can contribute to poverty reduction, if it is tailored to the needs of the poor and if it is used in the right way and for the right purposes. It can also boost economic growth, that helps to reduce poverty, but this is unlikely to happen in countries where there are persisting and fundamental socio-economic inequalities. Complementary social policies are required to prevent market failures and promote sustainable development.

Like all technologies, ICT offers tools and applications but no solutions. The solutions to the problem of poverty are what they have always been: economic growth, enabling infrastructure, the creation of livelihoods, education and healthcare, and sufficiently democratic government to ensure that economic benefits are not cornered by the powerful elites. By providing cheap and efficient tools for the exchange of the information, ideas and knowledge ICT can become an enabling tool for wider socio-economic development. When properly used, it can greatly increase the ability of the poor people to benefit from economic development and from development programs meant to help them.

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