

ISSUES OF DIGITAL DIVIDE IN SOUTH ASIA: 'IT FOR PEOPLE' EXPERIMENTS IN THE REGION

Partha Pratim Sarker

Bytes for All, Bangladesh

Abstract:

This paper is aimed at examining the causes and consequences of digital divide in South Asia, a region that is often considered to be an area of major contributor to ICT developments. Development of major software-hardware industries, programmers, IT training schools, telecommunication businesses etc. that often get synonymous with South Asia, is also a region where a significant majority did not even hear a dial tone. The article will underline the scenarios that are contradictory and will review its relationship to social divides. Our idea is to focus on different access realities, policy issues, infrastructure etc through which this divide is being widened or entertained and to analyze the consequences that are natural to grow with this divide. But amidst this dismal backdrop the article will also focus on some alternative ICT initiatives that are directed to common people and to bring about a qualitative change to their lives. The article also recommends an outline on which ICT initiatives should be built up in order to bridge the gap that is already overwhelming in between information rich and poor.

Introduction:

The facts of 'Digital Divide' is not any surprising classification to South Asia and is rather a manifestation of other divides & disparities that already exist within the societies and have to be examined both in terms of technology ownership patterns and of resource distribution modes of our societies. Many other factors such as, lack of education, electricity and other infrastructures, language barriers, costly access to computers, lack of pro-poor ICT policies have also added more complexity to this situation. But unlike any other divides, digital divide deals directly with an economy that is entirely knowledge and information driven. In this economy the productivity and competitiveness of units and agents depends heavily on the capacity to generate, process and apply efficiently this knowledge-based information. Information itself has become the product of the production process.¹ As a result, the relationship between information and development stands in a way where it can be assumed, (a) information leads to resources; (b) information leads to opportunities that generate resources; (c) access to information leads

¹ The New Economy: Informationalism, Globalization, Networking: The Rise of Network Society, Manuel Castells, Page 78

to access to resources; and (d) access to information leads to access to opportunities that generate resources. For the poor without any access to this information would mean more acute form of deprivation of resources that are important for their livelihoods, education, health, survival etc. and recessions in perpetual ways of poverty. Where information is power, denying information to marginalized communities, actively prevents the rural poor from overcoming the unequal power structures that they are trapped within.² This position is also supported by the UNDP Human Development report where it says, the gains in productivity produced by the new technology may widen differences in economic growth between the most affluent nations and those that lack the skills, resources and infrastructure to invest in the information society: “The network society is creating parallel communications systems: one for those with income, education and literally connections, giving plentiful information at low cost and high speed; the other for those without connections, blocked by high barriers of time, cost and uncertainty and dependent upon outdated information.”³ Echoing these concerns, UNESCO emphasizes that the North-South divide may be exacerbated in a situation where most of the world’s population lacks basic access to a telephone, let alone a computer (UNESCO 1998). The 2000 Okinawa Summit of G7/G8 nations first describes ‘ICT (specifically, the lack of it) may be considered both as a cause and an effect of poverty’. The existing gap between information rich and information poor population was officially termed to be ‘digital divide’.

The issue of digital divide is therefore very important to discuss. South Asia being so widely known for software export and ICT based human resource development remains on the darker side of the divide and are experiencing the widest partition and consequences of information rich and poor on the other hand.

Is ICT a Real Need?

ICT may be Web-enabled, networked, or stand-alone and its penetration depends on few other access realities such as access to computers, access to tele-communication facilities, access to Internet, access to electricity, access to English language, access to education, access to skilled human resources etc. Data on Human Development Report published by UNDP illustrates an interesting fact that 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 South and South-East Asia), the lower the poverty index.⁴ This co-relation between ICT and poverty does not mean that poverty is being created or extended due to lack of ICT access but sets the background of poor governance of these countries for which ICT penetration is low and subsequently represents the low level of knowledge and use of these tools to eradicate poverty. Most of the decision makers of the poorer countries actually think for sequential mode of development where many other elements come first on development agendas rather than ICT and are unaware of the potentiality and the applicability of these tools in

² When a Modem Costs More than a Cow, Shahidul Alam, Bytes for All Issue, <http://www.bytesforall.org/2nd/shahidul1.htm>

³ UNDP Human Development Report 1999, United Nations Development Program, Oxford University Press: New York and Oxford, 1999

⁴ UNDP Human Development Report 1999, United Nations Development Program, Oxford University Press: New York and Oxford, 1999

development processes. Even if ICT gets a chewing priority it is more to be limited in rhetoric rather than in practical work and initiatives that might include the significant un-connected majority of these countries.

‘Digital Divide’ also confronts with the theme whether ICT is a real need for the poor or is just another marketing impulse of big players. To resolve this:

First: ICT needs to be viewed as a tool, as a means for development not as a magic bullet. ICT can not change the world poverty situation overnight unless some other developments do take place. For example, the impact of improved ICT access on farm earnings through increased knowledge of market prices will be of no use if there are no roads to carry crops to markets, or no markets because of an unreformed agricultural sector.⁵ As mentioned by Richard Heeks in one of his research articles ‘the poor needs knowledge to access, assess and apply existing information and need resources for action more than they need access to new information’. ICT can provide that knowledge (by providing information on market prices, creating job opportunities, enhancing productivity, sorting new e-markets etc.) and resource of action (by accommodating voices from the poor, translating knowledge into ground level inputs, improving government services etc.) in the fight against poverty. ICTs have many catalytic or leverage affects that can improve condition and access situations to education, medical facilities, economic opportunities etc.

Second: Even in demand driven economy electricity, telephony and other connectivity cannot grow as long as the demand for such resources is developed. Information network can be viewed as the pipeline through which capital can flow into the villages and poor areas through a new form of non-discriminatory, relatively clean and relatively unoppressive industrial and commercial activities. This ICT based network can actually compensate the rural or underdeveloped economy by providing an alternative means of communication such as online work, trade, payment, networked service delivery system etc. that might allow the users to overcome the problems of weak or poor infrastructure. And finally if the network system can allow the capital to be so readily and easily available to the rural communities, then it will mean more spending to finance basic infrastructure, including roads, dispensaries, water and sanitation systems and so forth.⁶

In a context where the poor has ‘lack of access to information that is vital to their lives and livelihoods: information about market prices for the goods they produce, about health, about the structure and services of public institutions; about their rights, lack political visibility and voice in the institutions and power relations that shape their lives’ it is unlikely that they would be able to effectively use the technology/solutions even if these are made available to them. In that case the role of intermediaries might be important who would introduce these technologies to the grassroots level and will run different pilot projects to make the ICTs owned and used by the communities and to

⁵ Information and Communication Technologies and Poverty, C. Kenny, J. Navas-Sabater, C. Qiang

⁶ A Social Investor’s Guide to ICTs for Development by Aditya Dev Sood, Page 7, Published by Center for Knowledge Societies, Bangalore

make it self-sustainable. ICTs can help a range of intermediary institutions and agents work more effectively and to be more responsive to the needs of the poor.

As mentioned earlier in the article, the concept of digital divide has to be viewed in the context of few other access realities and these accesses can be compared and analyzed to each other as in many cases access to electricity, telephone, computers, internet are basically interlinked and are based on some common denominators.

Access to Tele-communication facilities:

The dismal picture of tele-communication penetration in South Asia illustrates the real reason of low ICT accesses to societies. As mentioned by one of the BBC online reports, ‘Two billion people on the planet have never made a phone call, let alone dialed up America Online. Even if they did manage to get to a phone line, it costs five times as much to log on in developing countries as in North America or Europe.’⁷ Bangladesh with over 135 million population remains as one of the nations of lowest tele-density in the world. With a combined density (0.46) of fixed and mobile, Bangladesh ranked 39th among the 40 countries of Asia Pacific region in 1999. Following figure (figure 1) shows the country specific position in South Asia in terms of tele-density.

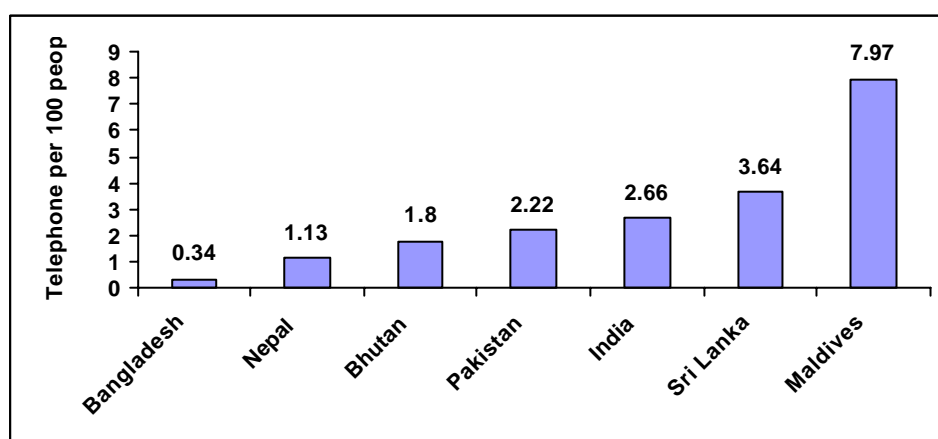


Figure 1/ south asia telecom indicator ⁸

High connection fees and prolonged waiting period coupled with severe corruption at the sector are seen to be the major obstacles for most of the people to get into tele-communication facilities. For example, Connection fee for fixed telephones in Bangladesh is Tk. 18,400 (US\$ 335), which is 27% higher than the per capita GDP of Bangladesh (US\$ 263).⁹ Following figure (figure 2) shows the tele-communication charges of different countries in South Asia. Interesting to note that the relationship

⁷ Is the web widening the poverty gap? <http://news.bbc.co.uk/1/hi/business/623643.stm>

⁸ ITU Asia-Pacific Telecommunication Indicators 2000, Page # 52.

⁹ ITU Asia-Pacific Telecommunication Indicators 2000, Page # 52.

between tele-communication charges and penetration stands at a point where we can say, the higher the telecommunication charges are, the less the penetration is and that is also visible for countries in South Asia.

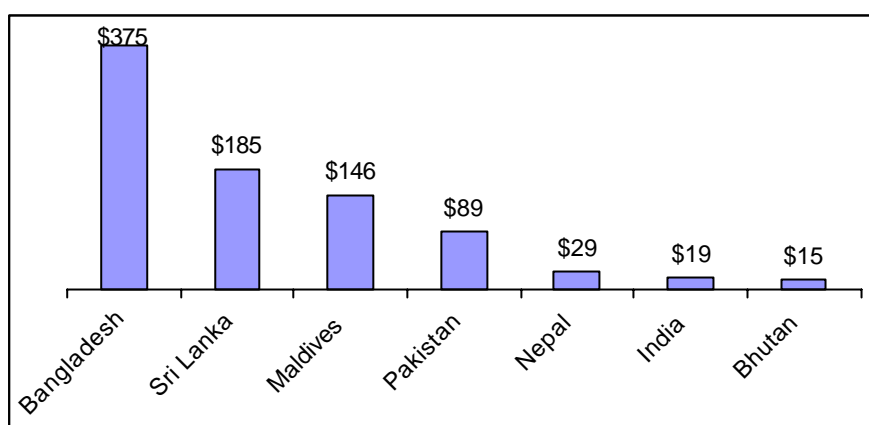


Figure 2 Connection fees in South Asia

Even within the country, the diffusion of tele-communication is not equal and this difference is again another divide within the countries of acute digital divide. This also clarifies the ownership pattern and the community that enjoys the benefits of being networked as to avail these opportunities might also require certain level of education and income attainments. As in the case of India, following table (table 1) is showing the unequal distribution of telecommunication accesses in different states of the country.

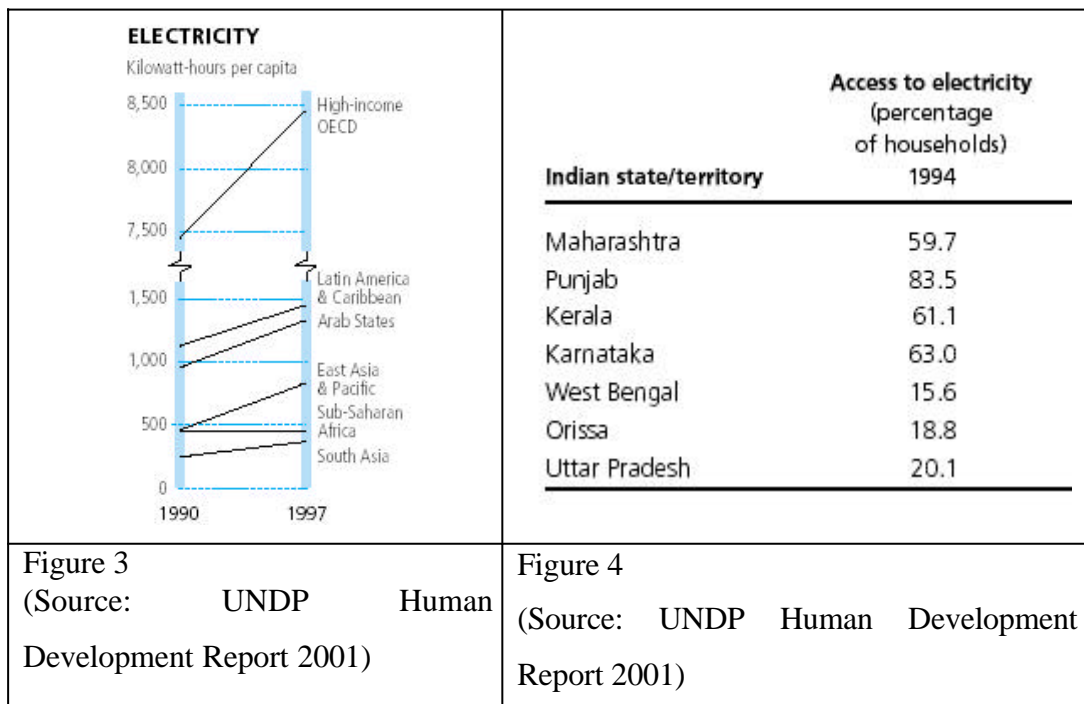
Name of the States in India	Access to Telephones (per 1000 people)
Maharashtra	43
Punjab	47
Kerala	43
Karnataka	29
West Bengal	16
Orissa	9
Uttar Pradesh	10

Table 2 (State wise telephonic penetration in India) ¹⁰

Access to Electricity:

¹⁰ UNDP Human Development Report 2001

Electricity is vital to run computers, to enjoy digital facilities or to get connected. *Electricity* has not reached yet some 2 billion people, a third of the world's population. In 1998 average electricity consumption in South Asia and Sub-Saharan Africa was less than one-tenth compared to OECD countries¹¹. Even within the country, a small portion of urban population (for example, in Bangladesh 30% of the population) is actually networked to electricity system. In most of the rural areas of the least developed economies electricity is not a regular feature or even a luxury item. Even if they have electricity, it doesn't last through the day and may be restricted to few hours. When electrical power is available, its voltage and frequency may not be at a satisfactory level to run a computer system. Following figures show the regional situation on electricity consumption with a low average consumption in South Asia (figure 3) and state level electricity usage (figure 4) in country like India. Uneven access to electricity and telephones are nothing new but demonstrates an important ground of digital divide as computer and network access rely heavily on these systems though progresses have been made on alternative, wireless or even solar powered based network buildups.



Access to Computers:

Access to computers is vital for any digital activity. ‘Moore’s law predicts the doubling of computing power every 18–24 months due to the rapid evolution of microprocessor technology. Gilder’s law predicts the doubling of communications power every six months—a bandwidth explosion—due to advances in fibre-optic network technologies.

¹¹ UNDP Human Development Report 2001

Both are accompanied by huge reductions in costs and massive increases in speed and quantity'.¹² Despite this low cost trend of computer and related hardware, all economies did not show an upsurge of computer and Internet usages. Though the Asian developed economies have shown a rising trend in the use of personal computers, other economies such as India that have even shown great successes in software export, did have far fewer numbers of personal computers per capita. In the following figure (Figure 5) one can see, South Asian countries do have lowest per capita computer in the list, ranging from one computer per 1000 people in Bangladesh to 4.3 in Pakistan. Obviously the cost and knowledge associated with the computer usages are treated to be one of the major reasons of such stumbling blocks.

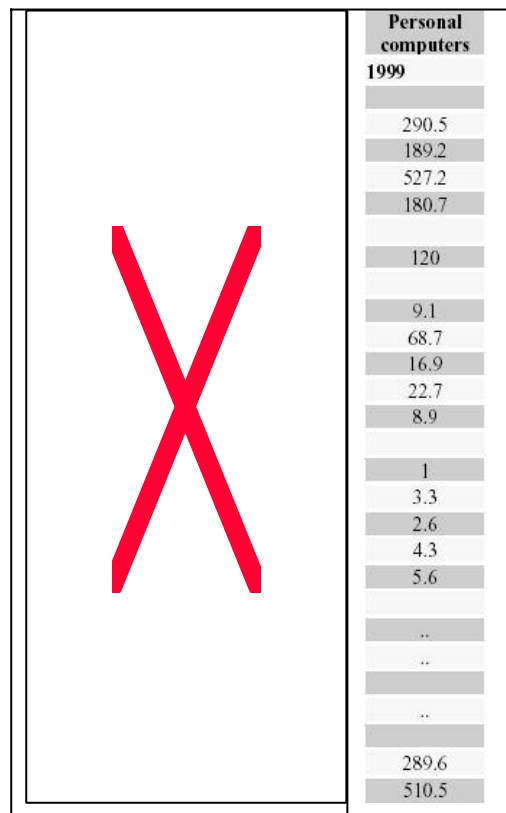


Figure 5 (Computer diffusion in selected economies) Source: International Telecommunication Union (2000), NUA Internet Surveys (2000).

¹² UNDP Human Development Report 2001

Access to the Internet:

The Internet (including the World Wide Web) is one of the most important technologies to affect not only communication but also computerization. Yet, it also breaks down boundaries between all forms of communication—new and old—by allowing multiple modes of communication such voice, data and video transmission in real time. The Internet is fast evolving, going beyond PCs and into palmtops, mobile phones and soon, appliances. It remains the only medium that gives scope - relatively inexpensively, and without the support of the gatekeepers – for a lone voice to be heard. But Internet diffusion across countries is significantly unequal. A recent study shows that Internet use is highly correlated with income. South Asia with 23% of world population has less than 1% of world Internet users. "The typical Internet user worldwide is male, under 35 years old, with a university education and high income, urban based and English speaking—a member of a very elite minority." (* UNDP Human Development Report 1999). Following figure (figure 6) shows how South Asia being a major contributor to software development industry has become a minor user of the Internet in the global context.

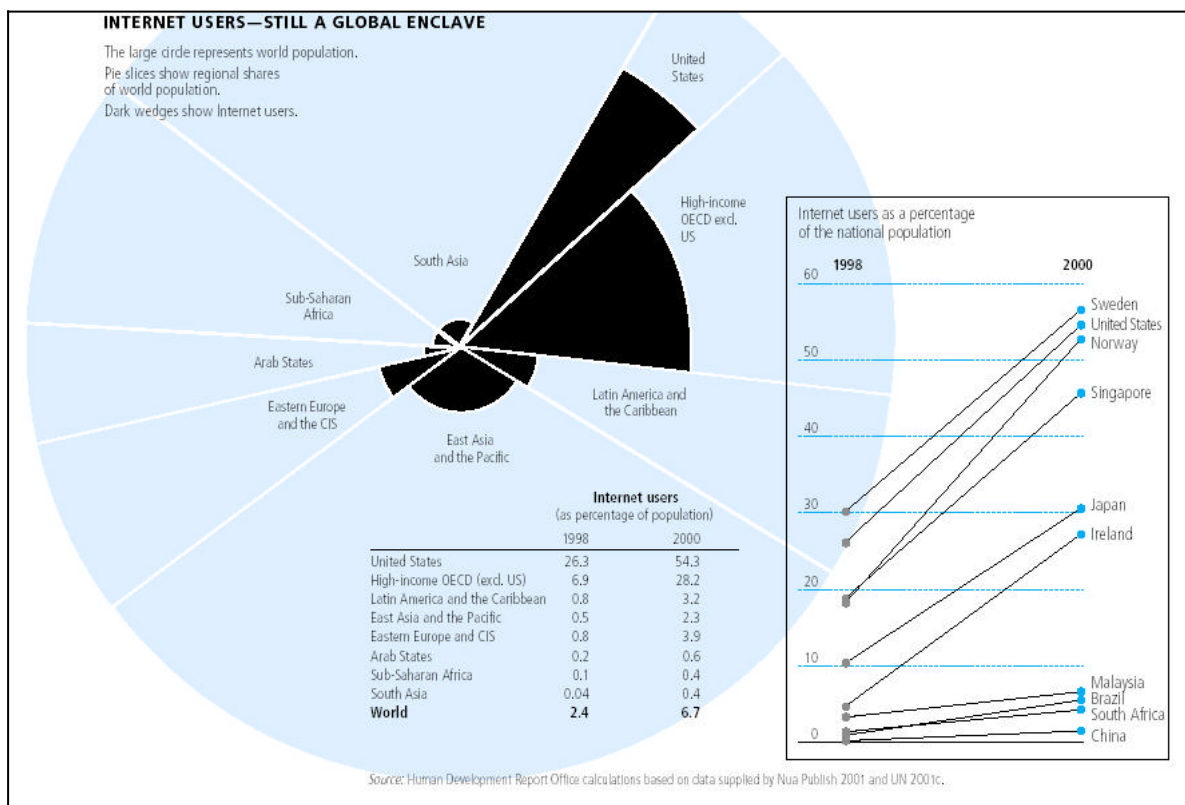


Figure: 6 (Internet Diffusion Across the World)

Source: UNDP Human Development Report 2001

‘Telephone use is strongly correlated with personal computers and Internet use. Internet has a high correlation with telephones largely reflecting their complementary nature. The connection between Internet usage and income level increases when controlled for

telephones. This suggests that when the telephone infrastructure exists, income level becomes the principal determining force.’¹³ Growth of Internet in South Asia is seriously retarded by government restrictions, high cost of tele-communication facilities, lack of infrastructure, education etc. For example, in Bangladesh traditionally the Govt. had been very restrictive on the use of Internet and allowed the ISPs to pay huge amount of taxes on VSAT holding and installations. Last time in 2000 when the Govt. decided to withdraw the huge taxes on VSATs and on computers, it shoots up the number of Internet users coupled with the feature of reduction of costs. Following figure might show the whole trend and growth of Internet users in Bangladesh but still most of the connectivity is centered round the cities, more particularly the capital city, Dhaka. Situation in other South Asian countries are almost the same. Government owned VSNL had been the one and only gateway for quite a long time in India.

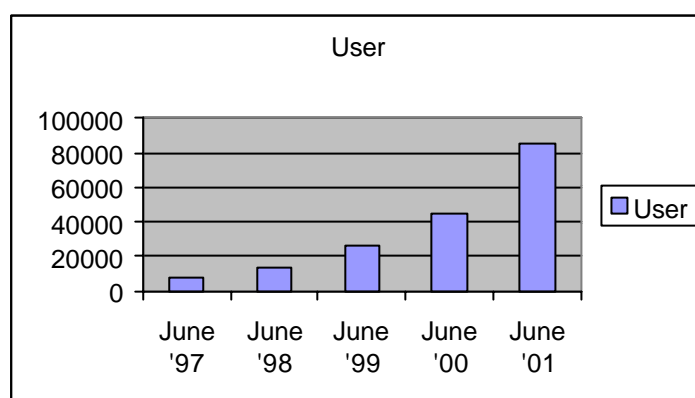


Fig.-7
Growth of
Internet users
in Bangladesh

14

Access to English Language and Education:

English language skill is a must for using a computer and operating an automation system. Modern computers are products of Western innovation. Most handbooks and guides are prepared in English. All popular operating systems and applications packages are available only in English. The reason for that is twofold: English is unofficially the *lingua franca*, and secondly, major computers manufacturers are from English-speaking nations. English dominates the Web (80 percent of all Websites are in English), as well as the digital content market, including CD-ROMs. The existing user interface paradigm of files and folders evolved because computers were essentially designed for a western audience familiar with real-life files and folders. There is no reason to assume why the same paradigm should apply to a trader in Tamil Nadu or a farmer in Bangladesh. Simple regression analysis in between ICTs, income and education shows that advanced ICT and Internet usages rest on the level of secondary and tertiary education. The general hierarchy of information on the Internet is very much in a ‘Top-Down’ mode and most of the information available on the Internet is of no use to the poorest of the world. Even at the global level, generation of information and content on the Internet is clearly unequal.

¹³ Information and Communication Technologies and Poverty: An Asian Perspective By M. G. Quibria and Ted Tschang January 2001 Published by Asian Development Bank Institute

¹⁴ Current Situation of E-commerce in Bangladesh, Md.Sharif Uddin, BTTB, Bangladesh

A recent host survey shows that Africa generates only 0.4 percent of global content. Excluding South Africa, the rest of Africa generates a mere 0.02 percent.

If ICTs are to be mainstreamed in the developing world, and local knowledge is to be shared, content in digitized form must also appear in local languages with a widely accepted standard format such as ASCII (American Standard Code for Information Interchange).

Initiatives in South Asia:

The poor have information, knowledge and communication needs as do all people, yet they are often unable to address them. Given the multiple constraints they face, the poor are either unable to meet these needs, or must do so in costly ways that may perpetuate their disadvantaged position.¹⁵ In the context of access realities a number of creative and alternative solutions have also spurred up in the region, which has tried to incorporate the poor, their information needs and have addressed the barriers that exist in between information rich and poor. A list of such initiatives is also given below:

Name of the Project: Grameen Bank Village Pay Phone (VPP) Project
Country of Origin: Bangladesh
Categories: ICTs and Income Generating Opportunities
Supporting URLs: <http://www.grameenfoundation.org>
<http://www.grameen-info.org>
Contacting Address: Grameen Bank, Grameen Bank Bhaban, Mirpur 2, Dhaka 1216, Bangladesh
Project Description: A sister concern of Grameen Bank (GB), Grameen Telecom (which is also 33% shareholder of Grameen Phone) offers cellular telephony for rural users through a Village Pay Phone (VPP) Project. Through this project, a number of Grameen Bank borrowers who are poor women in the rural areas of Bangladesh are granted a revolving loan valued at Tk. 15,000 (equivalent to 300 US\$) in the form of a VP package containing a Nokia 1610 cellular phone, a battery, a fast charger, a sign board, a calculator stop watch, a user guide in Bangla and a price list for calling different locations. This loan is paid back within two to three years through an existing weekly payment system as with any other micro-credit programs of the GB. However the air time bills are paid monthly. So these 'phone-ladies' around the village run phone centers by renting out mobile phones across the villages and by charging on sent and received phone calls. The income derived from the VP was reported to be about 24 percent of the household total on average; in some cases it was as high as 40 percent. On average, a VP operator earns an income of Tk 14,400 or roughly \$300 per year from providing telephone services. This exceeds the

¹⁵ The significance of information and communication technologies for reducing poverty: Development Policy Development, DFID, November 2001

average per capita income of Bangladesh (of around \$286) by \$14. Through this process Grameen Phone hopes to build up the network across 68,000 villages in the country and are thinking to tag up email, Internet and fax services in the near future.

But there are several limitations to the success of VPP project. First: these 'phone-ladies' were selected under some strong conditions such as, good repayment records, experience of running small and profitable businesses, being literate, having children who are at least school educated and/or are residing near the center of the village. These were important to ensure the successes of the model but that also illustrates the fact that the poorest of the poor did not have any access to this technology at least as an operator or entrepreneur. Second: sustainability of the VPP projects depends on the demands of communication in a certain village. With the opening up rural market to different mobile companies and also with multiple number of VPP operators in a single village might cause a sharp downturn of VPP operator's businesses. In that case general users will get more and cheaper options while the VPP operators might loose the businesses.

(Project Description has been collected from TeleCommons Development Group, Grameen Telecom's Village Phone Programme in Rural Bangladesh: A Multi-Media Case Study, Final Report for CIDA, prepared by Don Richardson, Ricardo Ramirez and Moinul Haq, 2000, ADB Institute Working Paper on 'Information and Communication Technology and Poverty: An Asian Perspective' By M. G. Quibria and Ted Tschang).

Name of the Project: Gyandoot Project
Country of Origin: Dhar District, Madhya Pradesh, India
Categories: ICTs and Income Generating Opportunities, E-governance Models
Supporting URLs: <http://www.gyandoot.net>
Contacting Address: Chief Executive Officer, District Panchayat, Dhar, India, Zip Code: 454001
Project Description: Gyandoot (meaning messenger of knowledge) is a unique e-government project in Dhar district, Madhya Pradesh State in Central India. The project began in November 1999 and is serving more than 500,000 people. Important information of this population such as income, caste, domicile, land ownership and records, and loan records is computerized. An intranet network connects the computerized system from the district headquarters to 21 privately-run cyber-cafes (called *Soonchanalays*, meaning information centers) across the rural tribal district of Dhar. From the cyber-cafes, villagers are offered a number of different services such as the provision of domicile certificates, land-ownership certificates, the most up-to-date prices of agriculture products

(such as soybean and wheat) and information on welfare services available in the district. The cyber-cafes can be accessed easily since their locations are often at the roadside of the central villages where people normally pass. Farmers can also get daily updates on market prices of locally produced food grains and vegetable crops such as potato, maize, tomato or soybean in various markets around the district for Rupees Five.

In addition to these services, villagers can also file complaints to top officials of the district administration about non-delivery of public services such as absences of teachers, malfunctioning pumps, irresponsible officials or poor seed/fertilizer provided by certain traders. These complaints can be sent through an electronic form online and replies are guaranteed within seven days.

Another remarkable feature of the project is its financial sustainability and customer orientation. An initial fund of Rs. 2,500,000 (equivalent to \$55,000), borne by the elected village councils, was invested in the whole network of 21 cyber-cafes—an upshot of the decentralization drive embarked on by Madhya Pradesh. The selection of services, operators, and the design and testing of the network were all performed through regular consultations with the local villagers prior to operation. The operators (called *soonchaks*) selected by the council were mostly youths from the village and a government employee. They were trained at their own expense to run the cafes (equipped with a computer, a modem and a printer) at their own cost. Each has to pay the councils 10 percent of the income earned through user fees. (Project Description has been collected from ADB Institute Working Paper on 'Information and Communication Technology and Poverty: An Asian Perspective' By M. G. Quibria and Ted Tschang., A Social Investor's Guide to ICTs for Development By Aditya Dev Sood, The Stockholm Challenge Award Information on Gyandoot <http://www.stockholm.se>)

Name of the Project: M S Swaminathan Research Foundation
Country of Origin: Chennai, India
Categories: Rural Telecenters
Supporting URLs: <http://www.mssrf.org>
Contacting Address: Third Cross Road, Taramani Institutional Area, CPT Campus,
Chennai (Madras) 600113, India

Project Description: M S Swaminathan Research Foundation is one of the pioneers in developing participatory Village Information Centers (or Tele-centers) in the rural areas of Southern India. This foundation has established five centers (in different villages of Pondicherry) that can communicate with each other as well as to the Internet. A hybrid of technologies is used—wired with wireless for communication and solar with mains for power supply. The hub provides connectivity to the Internet through dial-up telephone lines, and the staff there creates locally useful content. The village centers receive queries from the local residents and transmit information, collected from the hub, back to them. An important feature of this project is the strong sense of ownership that the village communities have developed towards the village centers. The other key feature is the active participation of rural women in the management of the village center as well as in using it. A system of close consultation between the project staff and the rural users has been evolved, so that information needs are realistically assessed. Quantitative data are collected on the use patterns, and stories of deriving benefit have been chronicled. These centers have also made some interesting mixing of offline-online information delivery methods. Like for example, in one of the fishermen's villages in Pondicherry, MSSRF tele-center downloads regular weather information via US commissioned spy satellites and transfer these in local language for local needs. This information is then transmitted via loudspeaker to the bay or lagoon areas from where fishermen go into deep sea.

The main benefits from the centers were improved access to information, which helped make livelihoods more secure, sustainable (profitable) and safe; and development of skills. The skills developed included simple information seeking skills, while others were more complex, e.g., some volunteers learned Hypertext Markup Language (HTML) (needed for Web site development). This may be the first sign of progression to higher levels of technological sophistication. The access to opportunities, skills and information also illustrated the value of ICTs—as a means of putting some people on the path to careers with greater incomes.

Although the project displays outstanding sensitivity to local needs and has conducted pioneering participatory experimentation and documentation, it has not developed a strong economic model to ensure its financial sustainability. For this reason, the project could not be expanded or scaled up to other areas of the same region. (Project Description has been collected from ADB Institute Working Paper on 'Information and Communication Technology

and Poverty: An Asian Perspective' By M. G. Quibria and Ted Tschang., A Social Investor's Guide to ICTs for Development By Aditya Dev Sood, Assessment of Impact of Information Technology on Rural Areas of India, MS Swaminathan Research Foundation, <http://www.mssrf.org>)

- Name of the Project: Kothmale Internet Radio Experience
Country of Origin: Kothmale, Sri Lanka
Categories: Community Radio with Internet Connectivity
Supporting URLs: <http://www.kothmale.net>
http://www.unesco.org/webworld/netaid/com/sri_lanka.html
Contacting Address: Kothmale FM Community Radio Riverside,
Mawathura, VIA GAMPOLA, Sri Lanka ph (61) (08) 350 421
Email: kc_radio@email.com
- Project Description: Kothmale Community Radio experiment is a unique experience of serving the community through radio means and of marrying Internet with that of traditional technology such as radio. The Kothmale community radio serves a target area of almost 8000 sq. km, which includes a number of rural settlements such as Gampola, Nawalapitiya and Thispane. Radio programs are broadcasted mainly through FM channels and are listened by a large number of rural audiences. The Kothmale community radio, connected to the Internet, serves as a link between this powerful source of information and rural populations. The radio team browses the Net for information requested by the audience, translates it into the local languages and then broadcasts it in a daily programme. If requested, it also provides printouts of the downloaded information. The community radio also develops its own computer database compiling information from the Internet that is often requested by community members. Much of the information on this website is available in local languages. This database attempts to solve the problem of non-availability of packaged information on the Internet adapted to rural needs. In addition, a collection of CD-ROMs will be made available at the community radio for public use.

In parallel, local communities are provided with free Internet access. Besides its own Internet Café, the community radio has set up two free Internet access points at Gampola and Nawalapitiya community libraries. This has a big advantage for rural users, since even those of them who may have access to the Internet have to pay a long distance telephone call each time they use it, a luxury that only very few can afford. The access points are also used as direct links to radio station to produce and air live broadcast programmes.

Despite its outstanding nature of integrating community with the Internet and the radio, the financial sustainability of the project is yet to be placed in a strong base. The telecommunication costs of dedicated Internet access at the community radio and the other two access point are absorbed by the Government for two year period within which community radio will have to develop an income generation strategy to sustain the facility. This would mean that the community radio would have to generate additional income of US\$ 1,000 per month. Some income will come from charging for print outs of the public domain Information retrieved from the Internet. Already work has begun to host a number of commercial WEB sites at the Internet server available at the radio station. The local youth have been trained to design and develop WEB sites for private sector. The Server also has facilities to provide seven additional access points, which the community radio intends to rent for governmental and non-governmental organisations. With the "Radio Browsing the Internet " programme management hopes to get more income from radio advertising.

(Project Description has been collected from UNESCO report on Communication – Projects

http://www.unesco.org/webworld/netaid/com/sri_lanka.html,

Internet Radio in Sri Lanka by [Wijayawanda Jayaweera](#)

http://www.unesco.org/webworld/highlights/internet_radio_13059_9.html)

- Name of the Project: BHOOMI Project
Country of Origin: Karnataka, India
Categories: E-governance Model, Land Records Computerization
Supporting URLs: <http://www.revdept.kar.nic.in>
Contacting Address: Additional Secretary, Revenue Department
Room No. 603, III Stage, 6th Floor
M S Building, Bangalore 560001, India
- Project Description: BHOOMI is a major Govt. of Karnataka initiative to computerize land records across the state. The programme, in simple terms, is the computerisation of 20 million records of land ownership in Karnataka's farming community. Any farmer in the state can today get a copy of the Record of Rights, Tenancy and Crops (RTC), a critical document of ownership required to avail bank loans, for a user charge of Rs.15. All the farmer has to do is go to the Bhoomi centre at the sub-district office and obtain the required document, be it the RTC, a mutation extract for a piece of land that has been sold or a title deed. Before Bhoomi, the process took weeks and was riddled with corruption. Farmers claimed they had to pay

anywhere between Rs.100 and Rs.2,000 in bribes to officials. Now Bhoomi directly impacts 6.7 million farmers across Karnataka.

One important element of BHOOMI is its model of sustainability. "The popularity of the programme is evident from the revenue that the state has earned in the last three months. We have been getting Rs.7-7.5 million every month since March," said Rajeev Chawla, additional secretary in the state revenue department. "It means that nearly 400,000 records have been issued every month from one or the other of our Bhoomi kiosks since October 2000, when the project was launched in one sub-district."

(Project Description has been collected from A Social Investor's Guide to ICTs for Development By Aditya Dev Sood and BHOOMI Website

<http://www.revdept.kar.nic.in/rev/Circular.nsf/rtc>)

Name of the Project: Honey Bee Database
Country of Origin: Gujarat, India
Categories: Local Language based Indigenous Knowledge Bank
Supporting URLs: <http://www.sristi.org/knownetgrin.html>
Contacting Address: SRISTI
P.O. Box : 15050
Ambavadi P.O., Ahmedabad 380015 , Gujarat
India

Project Description: Honey Bee Network is a local innovator's network with two objectives at hand. First: to ensure that when we collect knowledge of people we should ensure that people don't become poorer after sharing their insights with us. Second: to connect one innovator with another through feed back, communication and networking in the local language. Over the years this network has documented innovations, traditional practices & collected outstanding examples of contemporary knowledge to form a 10,000 strong database (Honey Bee Database of Grassroots Innovations) part of which has been converted as multimedia database. Honey Bee Network expresses the concern "We write in the English language which connects us globally but alienates us locally. We cannot reach the people from whom we have learnt. Thus while we grow in our careers and achieve wider recognition and professional rewards, the people often suffer silently. The ethics of knowledge extraction, its documentation, dissemination and abstraction into theories, institutions or technologies is thus our central concern". This Honey Bee network is rather run voluntarily by Sristi which is a registered non-governmental organization that works to strengthen the creativity of grassroots inventors, innovators and

ecopreneurs engaged in conserving biodiversity and developing eco-friendly solutions to local problems.

(The information has been collected from Honey Bee Network website)

Name of the Project: Center for the Development of Advanced Computing (CDAC)
Country of Origin: Pune, India
Categories: Local Language Initiative
Supporting URLs: <http://www.cdacindia.com/html/qist/qistidx.htm>
Contacting Address: Center for Development of Advanced Computing, Pune University
Campus
Ganesh Kindh Road, Pune 411007, India

Project Description: C-DAC has been a pioneer in developing and proliferating the use of Indian languages on computers. This technology is now extended to include multimedia and multilingual computing solutions covering a wide range of applications such as publishing and printing, word processing, office application suites with language interfaces for popular third party softwares on various operating platforms, electronic mail, machine translation, language learning, video and television and multimedia content in Indian languages. These have been successfully commercialized. The two groups of C-DAC involved in the development of multilingual technologies are: (1) [Graphics and Intelligence based Script Technology \(GIST\)](#) The GIST Group of C-DAC facilitates use of Indian languages in IT. In its endeavor to stay abreast with technologies worldwide, GIST has been adopting the latest concepts to be able to stay tuned with the Internet enabled world. (2) [Applied Artificial Intelligence \(AAI\)](#) The AAI Group of C-DAC is involved in a number of activities such as knowledge-based understanding systems, Web-based solutions include Chat Server, and many other strategic software developments and solutions.

CDAC standards are now be legislated for use in most of the Indian government applications. Some of their productions are free to download while the rest especially the most advanced ones are prohibitively expensive for most users. Their strategy is to develop software suits parallel to Microsoft or Linux versions, rather than marketing plug-ins for them.

(The information has been collected from CDAC website and A Social Investor's Guide to ICTs for Development By Aditya Dev Sood)

Name of the Project: The SIMPUTER

Country of Origin: Bangalore, India
Categories: Low Cost Solutions of Connectivity
Supporting URLs: <http://www.simputer.org>
Contacting Address: The SIMPUTER Trust
Computer Science and Automation Management Services
Indian Institute of Science, Bangalore 560 012, India

Project Description: SIMPUTER is a small hand-held device, which can read a SIM card and also has advanced audio and text processing capabilities in several Indian languages. When a couple of years earlier the idea of SIMPUTER was announced, this simple, inexpensive, multilingual computing device were greeted to be one of the break through of technologies for the rural and illiterate users of a developing country. The hardware and software specialists involved in making the SIMPUTER comprise a world-class team that could scarcely be assembled anywhere in the developing country. Originally the device was expected to cost US\$ 200 to be affordable even by rural communities or entrepreneurs and is built around LINUX operating system. To make the Simputer easier to use, it incorporates icons, graphics and multi-lingual abilities. It also seeks to offer image/sound output and a touch-based input with voice feedback. The Simputer would have applications for education and literacy. Given its fairly high resolution 240 x 360 pixels screen, for its small size, it could be used for local language applications. Other applications for the Simputer are being worked out in the field of health and telemedicine; micro-banking; police work (information-retrieval, filing of first-information reports); land-records; meter reading; e-governance; and ticket-collection.

But some critics argue that increasing capacity and falling prices in the world hand-held PC market may have eroded some of its cost benefits that SIMPUTER used to enjoy. Moreover, the hand-held PC remains a person specific device, which may not be enough for serving the whole community.

(Information has been collected from SIMPUTER website, THE SIMPUTER GETS ITS FINAL TOUCHES AT THE FACTORY by Frederick Noronha (<http://www.bytesforall.org>) and A Social Investor's Guide to ICTs for Development By Aditya Dev Sood)

Name of the Project: Learn Foundation
Country of Origin: Sylhet, Bangladesh
Categories: ICTs and Education for Women
Supporting URLs: <http://www.domaindlx.com/learnbd/scripts/html/home00.html>
Contacting Address:

Project Description: Learn Foundation has pioneered a 'process approach' towards a technological capacity building in rural Sylhet where the process centers around village children acquiring latest computer skills, their collaboration with city based computer professionals and their growing eagerness to get to the Internet in order to become a part of the knowledge driven networked communities. LEARN's process approach has two components - social engineering component and the ICT (Information and Communication Technology) component. The agents for change in the social component are the children who are not only acquiring the ICT skills but also at the same time influencing their communities and their parents to accept ICT for social and economic advancement of their physically remote communities. This acceptance is reinforced by the fact that computing jobs are now being offered to the rural children from Dhaka and the US in exchange of scholarships. The ICT component lays the physical infrastructure in the community information and learning centers that combine computer literacy training facilities with online Internet connectivity through spread spectrum microwave links in villages where rural children obtain high level computer literacy skills for exports, and at the same time produce local content like webzines and provide a variety of computer related services to the local community such as word processing, desktop publishing, e-mail, voice- mail, personal photos for loan applications, access to government forms, etc.

Sustainability is aimed through two separate processes in the Tree-Child symbiosis within LEARN's knowledge pipeline loop. One is the environment pipe (the top arrow) where thousands of high value fruit/timber trees are planted where blocks of 35 trees are linked to each child. TEEF - Tree Education Endowment Fund - certificates for each tree offered to LEARN partners / associates for Tk 750, redeemable in 20 years at Tk 7500, for human resource training (HRT), knowledge management and software development collaborations over the Internet. The bottom layer is the knowledge pipe which starts at the LEARN's knowledge hut (age 3-5) and runs through school (age 10-17) and professional levels. Both the pipes physically meet at the technology parks which are being prepared at three sites in the picturesque tea estates in Sylhet - AXON, SYNAPSE and DENDRITE - named after the neural network in the human brain. Each site links clusters of rural learning schools called DLI centers as part of the DRIK LEARN Initiative steered by Media Lab of M.I.T, USA.

In just two years, the LEARN legion has more than 800 students over 5 rural centers, about 20 PCs, a mail server, a wireless link, more than 10 software partners, 4000 trees planted over 10 acres at

site AXON and dozens of village kids conversant with Visual Basic, SQL and database, HTML, Java, Photoshop and ASP (Active Server pages) technologies. A dozen students have started to work professionally for software companies in exchange of scholarships. An offshore cell will be operational in Toronto in December for porting back end web based technologies in Bangladesh for supporting Application Service Providers (ASP) in Canada and USA.

(Project Description has been collected from Learn Foundation website:

<http://www.domaindlx.com/learnbd/scripts/html/home00.html> and Laying " Knowledge Pipelines" in rural Bangladesh - LEARN Foundation's process approach in bridging the knowledge gap By Imran Rasheed (<http://www.bytesforall.org/3rd/learn.htm>)

Conclusion: What needs to be Taken Care of:

Digital Divide is as real as of other existing disparities. Therefore the causes of digital divide are not always a set of 'lacks' but also are other realities that maintain those disparities in the societies. Poverty cannot be addressed unless one addresses exploitation and distribution modes of the society. This applies not only to regional power relationships but also to global imbalances. While it is in the interest of the powerful in society to restrict such access, it is also in the interest of the powerful nations to deny access and maintain domination. In this context where information means power, ICT initiatives need to address this core concept of power relationship and should involve opportunities that might break the dependency structure. To initiate what would mean to empower poor people and to reduce the digital divide, ICT projects should (a) be developed in local language prioritizing the local needs and content (b) be a model of low cost solution so that poor people can replicate this model or can own or share the system (c) be owned and participated by the community in general (d) be sustainable in long terms (e) be able to adopt and utilize innovative ICT means that might be low cost and alternative solutions to century old access problems (f) be sensible to gender issues as issues such as infant mortality rate, family size, family income etc. has a direct relationship with women empowerment (g) be supportive to local and public access points as in rural areas where the divide is the widest ICT solutions need to reach the people through public access points.

Reference Studies:

Poverty Trends and Voices of the Poor, Fourth Edition, May, 2001, The World Bank Group <http://www.worldbank.org/poverty/data/trends/>

The Dimensions of Poverty, Social Watch Report 1997 (<http://www.socialwatch.org>) (An NGO watchdog system aimed at monitoring the commitments made by governments at the World Summit for Social Development and the Beijing World Conference on Women)

THE INTERNET AND POVERTY: Real Help or Real Hype? Panos Briefing No. 28 April 1998

Poverty Trends and Voices of the Poor: Social Indicators (Worldbank PovertyNet) (<http://www.worldbank.org/poverty/>)

Measuring Poverty, World Bank PovertyNet (<http://www.worldbank.org/poverty/>)

World Development Report 2000-2001 Published from the World Bank (<http://econ.worldbank.org/wdr/>)

The Commitments to Poverty Reduction, UNDP Poverty Report, 2000

Poverty Reduction Strategy Sourcebook: Information and Communication Technology (World Bank PovertyNet <http://www.worldbank.org/poverty/>)

The significance of information and communication technologies for reducing poverty, Development Policy Department, DFID, November, 2001

Income Poverty, World Bank, PovertyNet

UNDP Human Development Report 2000, 2001

Okinawa Charter on Global Information Society, G8 Scholarly Publications and Papers, University of Toronto G8 Information Center

Talero, E. and Gaudette, P. (1995) Harnessing information for development: a proposal for a World Bank Group vision and strategy, *Information Technology for Development*, 6(3/4), 145-188

The New Economy: Informationalism, Globalization, Networking: The Rise of Network Society, Manuel Castells

ICT for Economic Opportunity: Final Report of the Digital Opportunity Initiative, Accenture-UNDP-Markle Foundation Report

ICT and Poverty: The Indisputable Link, Paper for Third Asia Development Forum on “Regional Economic Cooperation in Asia and the Pacific” organized by Asian Development Bank 11-14 June 2001, Bangkok

A Social Investor’s Guide to ICTs for Development by Aditya Dev Sood, Center for Knowledge Society, Bangalore, India

Driving Information and Communication Technologies for Development: A UNDP Agenda for Action 2000-2001

Information and Communication Technologies and Poverty By C. Kenny, J. Navas-Sabater, C. Qiang (www.worldbank.org/poverty/strategies/chapters/ict/ict0409.pdf)

ICT AND POVERTY: THE INDISPUTABLE LINK By *Alexander G. Flor* Paper for Third Asia Development Forum on “Regional Economic Cooperation in Asia and the Pacific” organised by Asian Development Bank 11-14 June 2001, Bangkok.

Information and Communication Technology and Poverty: An Asian Perspective By M. G. Quibria and Ted Tschang. Published from Asian Development Bank Institute.

Assessment of Impact of Information Technology on Rural Areas of India (Implemented by [M.S.Swaminathan Research Foundation](#), Chennai, India. Supported by [International Development Research Center](#) (IDRC), Canada

"Digital Opportunities for All: Meeting the Challenge" Final Report of the Digital Opportunity Task Force Review by Madanmohan Rao, India.

Information and Communication Technologies, Poverty and Development By Richard Heeks, University of Manchester, Precinct Centre, Manchester, M13 9GH, UK

Information and Communication Technologies for rural development and food security: Lessons from field experiences in developing countries By Hilda Munyua, CAB International, Africa Regional Centre (<http://www.fao.org>)

Lessons for Development from the 'New Economy' [Richard Heeks](#) IDPM, University of Manchester, UK 2000

Software Applications and Poverty Reduction: *A review of experience* (Jane Millar , Robin Mansell University of Sussex, 30 June 1999).

World Telecommunication Development Conference 2002 The New Missing Link: The Digital Divide (International Telecommunication Union Publication <http://www.itu.int/ITU-D/>).

The Internet and Developing Nations: Issues in Developing Countries A Project by Karan Mahajan for CS99i: Business on the Information Highways. Last updated: April 3, 2002. (<http://www.stanford.edu/~kmahajan/cs99i/>)

Examples of Use of IT in Poverty Eradication in UNDP India (UNDP India website <http://www.undp.org.in>)