ICTs and Human Development in Asia

On Overcoming the 'Forever Pilot' Syndrome

A discussion paper prepared for the Asia-Australasia Regional Conference

of the International Telecommunications Society

Perth, Australia, 22-24 June 2003.

Stuart Mathison, FDC
info@fdc.org.au
www.fdc.org.au

The Foundation for
DEVELOPMENT COOPERATION

Abstract

Throughout the developing world, including in Asia, ICT for Development (ICT4D) has assumed the mantel of being the latest silver bullet in the fight against poverty. Indeed, many ICT4D pilot programs have been implemented and been shown to have a positive impact on poverty in a local context. However, the majority of these programs struggle to advance from successful local applications to programs of national and even regional significance. They are inflicted with a debilitating disease called the 'forever pilot' syndrome. At first glance, it is tempting to blame this malady solely on the Digital Divide but the fact that some pilot programs have been able to overcome the disease shows that the 'forever pilot' syndrome is more specific. This paper highlights some of factors that have enabled ICT4D initiatives to expand outreach to the multitudes.

Introduction

Over the last decade, hundreds of ICT for Development (ICT4D) initiatives have been implemented all over the developing world, including in Asia. They cover virtually every conceivable area of development application. Many hope that they will have a very positive impact for sustainable development and poverty reduction. However, the majority of these ICT4D initiatives seem to be inflicted with a debilitating disease called the 'forever pilot' syndrome - a malady whereby ICT4D initiatives are unable to progress from research pilot to an expandable and/or replicable program that has national and even regional significance.

The 'forever pilot' syndrome is not necessarily chronic or fatal, and the successful expansion and replication of a few ICT4D programs has highlighted a number of key success factors. This paper identifies and discusses these success factors and provides a number of examples of ICT4D initiatives that have been successfully up-scaled.

Human Development and Poverty in Asia

Approximately 24 per cent of the population of developing countries in Asia, or about 760 million people, live in poverty. All developing countries in Asia, except Malaysia, Thailand, Philippines and China have rates of poverty greater than 15 per cent of their respective populations. Nepal has the worst rate of poverty at 43 per cent, closely followed by Cambodia, Bangladesh and Pakistan. In terms of absolute numbers, India is by far the worst case, with more than 330 million people living in poverty. South Asia accounts for 61 per cent of Asia's poor. Poverty in Asia is both massive and pervasive.

The Millennium Development Goals

In order to provide focus to the tasks of sustainable development and poverty reduction, the UN has defined eight Millennium Development Goals (MDGs) to be achieved by 2015 (Table 1).

MDG	TARGETS
1. Eradicate extreme poverty and hunger	Between 1990 and 2015: - Halve the proportion of people whose income is less than USD 1 a day. - Halve the proportion of people who suffer from hunger.
2. Achieve universal primary education	- Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.
3. Promote gender equality and empower women	- Eliminate gender disparity in primary and secondary education preferably by 2005 and in all levels of education no later than 2015.
4. Reduce child mortality	- Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate.
5. Improve maternal health	- Reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio.
6. Combat HIV/AIDS, malaria, and other diseases	- Have halted by 2015 and begun to reverse the spread of HIV/AIDS. - Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.
7. Ensure environmental sustainability	- Integrate the principles of sustainable development into country policies and program and reverse the loss of environmental resources. - Halve, by 2015, the proportion of people without sustainable access to safe drinking water. - Have achieved, by 2020, a significant improvement in the lives of at least 100 million slum dwellers.
8. Develop a global partnership for development	- Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.

Table 1 Millennium Development Goals (Source: www.developmentgoals.org)

It is difficult to judge the extent to which developing countries in Asia are tracking against MDG targets because data is lacking for many countries and in many areas. However, analysis of the data that is available suggests that progress is generally behind schedule and, in many cases, far behind schedule (UNDP, 2002).

The ICT4D sector has emerged against the contexts of both the global information revolution and the continuing reality of massive poverty in the developing world. The emphasis of the ICT4D sector is not so much on the development of a global ICT industry but on the application of ICT to human development. In light of the current UN emphasis on the MDGs, many people are now asking*, 'How can we apply ICTs to achieve the MDGs?'* However, in light of the massive nature of poverty in Asia and elsewhere, a related question is, *'How can we hope to achieve the MDGs without widespread and innovative application of ICTs?'.* If the answer to this question is *'we cannot hope to meet the MDGs without ICTs',* then this gives additional urgency to the task of bridging the digital divide.

Some examples of ICT4D applications are listed in Table 2.

MDG	ICT FOR DEVELOPMENT APPLICATIONS
1. Eradicate extreme poverty and hunger	Microfinance: mobile portfolio management; smart card technology; ATM Telecentre: as a franchised business, as provider of SME support services. Tourism, especially eco-tourism and culture tourism. Farm MISs; Agribusiness; Fisheries (e.g. storm warnings in coastal India).
2. Achieve universal primary education	Teacher training by distance education. Combining Internet and Radio/TV. Youth Asia Television. Online libraries for school resources.
3. Promote gender equality and empower women	Online 'anonymous' space for discussing domestic violence issues etc. Development of gender-sensitive ICT strategies and policies.
4. Reduce child mortality **5. Improve maternal health** **6. Combat HIV/AIDS, malaria, and other diseases**	Tele-health – access to specialist; GP applications. Health databases. Health networks (doctor-doctor, doctor-hospital, hospital-community health worker) Community health education via radio – satellite, FM, short-wave.
7. Ensure environmental sustainability	Land and water resources management. Integrated pest management.
8. Develop a global partnership for development	Global policy and standards for e-commerce.

Table 2 The MDGs and ICT4D Applications

From Pilot Programs to National / Regional Strategies

Hundreds of ICT4D initiatives have been implemented throughout the developing world, including in Asia. The great majority of these initiatives could be described as 'pilot' programs or 'demonstrator' applications; showcase initiatives that are held up by both the development community and technologists alike as examples of how technology-based applications can be applied to achieve sustainable development and poverty reduction. The stated purpose of many of these pilot programs is not only to deliver poverty reduction outcomes for their immediate target communities but also to test methodologies and innovations, applications, content, etc. and to develop an agreed set of 'best practices' in ICT4D.

The research emphasis of the ICT4D sector has been financed by numerous international, regional and national organisations. For example, in 1995 the World Bank established *info*Dev (www.infodev.org) which, until very recently, operated as a global grant program to promote innovative projects on the use of ICTs for economic and social development, with a special emphasis on the needs of the poor in developing countries. Pan Asia Networking (www.panasia.org.sg) is an example of an Asia-wide regional grant program. PAN's aim is to promote electronic networking, the development and sharing of information resources, and the research and development of Internet systems, technologies and policies. On a national level, for example, Malaysia's Demonstrator

Application Grants Scheme (www.dagsclub.org.my) has provided seed funding for projects that contribute to community development through the application of ICT. Since 1998, the DAGS program has been an important feature of Malaysia's national ICT strategy.

While these ICT4D pilot programs have captured the imagination of many, the question remains whether or not they actually have a significant impact on poverty. Few of them have been able to quantify their impact; most rely on anecdotal evidence and presumption. However, even if we accept that these pilot programs are having a positive impact for poverty reduction, very few have achieved a level of outreach so that poverty will be impacted on a wider scale, beyond the local context of the pilot. For example, suppose there was an ICT4D initiative in India that was able to reduce poverty for 10,000 people. (The ICT4D community would consider this spectacularly successful). It is sobering to realise, however, that such a program would have to be expanded or replicated 30,000 times to reach all of the poor in that country. Clearly, small pilot programs that reach only a few hundred or even a few thousand people are not going to have a very significant impact on poverty no matter how successful they are as local initiatives; poverty reduction efforts need to reach the multitudes, one way or another.

It is becoming increasingly evident that the ICT4D sector is hampered by what we might call the 'forever pilot' syndrome - the inability to move from research pilot to an expanding program that has national and even regional significance. The 'forever pilot' syndrome is in contradiction to the assumed comparative advantage of ICT4D initiatives - that technology would overcome the tyranny of distance and facilitate a level of outreach that would result in a real and measurable impact for poverty reduction.

Fortunately, the 'forever pilot' syndrome is not necessarily chronic or fatal, and the successful expansion and replication of a few ICT4D programs has helped to highlight a number of key success factors. These success factors are outlined below. They have been gleaned from numerous case studies from throughout the Asia region (Kemp, Mathison, & Prasetyo, 2001; Mathison, 2002). Note that not every factor applies to every success story, although every success story exhibits a majority of these factors.

Financing expansion

Some ICT4D initiatives are inherently social welfare operations and these are not likely to be taken up by private sector interests for expansion. These programs are important and necessary, and they will always require grants to finance expansion. These grants will be sourced from either Official Development Assistance, private foundations or perhaps through the 'social conscience' grants of corporate entities.

The reality, however, is that grant funding is a very finite resource and only a very few ICT4D initiatives will be seen to be worthy of expansion. The naïve expectation of public sector funding for expansion of ICT4D initiatives is, perhaps, the primary cause of the 'forever pilot' syndrome. Most pilot programs are far too expensive on a per unit basis to justify public sector investment. On the other hand, a key feature of ICT4D initiatives that have been expanded under public sector funding is that these programs could be expanded at low marginal cost. A good example of this is the 'Digital Broadcasting Initiative', where the Worldspace Corporation sets aside five per cent of its satellite capacity for development-oriented digital radio broadcasts such as AIDS education in South Asia. The development NGO ('Equal Access') negotiated this arrangement that enables expansion on a regional and even global scale, enabling it to reach literally millions of people with important development messages. The UNDP provided funding to enable the NGO to develop the ground-level activities and content.

The majority of ICT4D pilot programs will not be eligible for public sector grants for expansion. Consequently, many NGOs need to change their mindset and accept that private sector investment (with a profit motive) will be the only way to expand outreach.

Many ICT4D pilot programs, by definition small and community-based, discover that they are ideally suited to a franchising model to facilitate expansion. Two examples of this are Drishtee in India and the Village Phone Project of Grameen Telecom in Bangladesh. Franchising is a good way to spread risk and to encourage 'entrepreneurial momentum' for the expansion. It also encourages local ownership and 'connection' with local circumstances and needs. In the case of Drishtee, local Community Information Centres are purchased by village entrepreneurs with loan finance provided by state government authorities. The Village Phone Project is similar, except that in this case, mobile phones are purchased by village entrepreneurs with finance provided by Grameen Telecom's sister company, the Grameen Bank. Phone access is sold at margin to village users.

The 'financing expansion' issue is one of a number of themes that will be addressed and discussed as part of the 'ICT4D platform', which is one of the official events associated with the upcoming World Summit on Information Society to be held in Geneva in December 2003.

Target the critical issues

ICT4D pilot programs should address one or more of the most critical issues for poverty reduction. The issues addressed by the Millennium Development Goals are a good starting point, although in the final analysis the most critical issues are context-specific. For example, in Asia, where there is a looming HIV/AIDS epidemic in a number of countries including India and China, an ICT initiative that improves access of general practitioners to specialist advice is not going to have the same impact as an initiative that effectively communicates messages about HIV/AIDS to millions of people.

To address these critical issues effectively, ICT4D initiatives need to utilise and develop local applications and content. The first and most basic requirement relating to content is that it is delivered in the local language – something that native English-speakers often overlook. Furthermore, to ensure relevance and appropriateness, content should be developed in the context of a local community and with the active participation of that community. This process might be referred to as 'information and communication needs analysis'.

Targeting the right people with the right technology

ICT4D pilot programs should specifically and deliberately serve the needs of the poorest people or, given the reality of the digital divide, they should specifically focus on intermediaries that work with the poorest people.

Whether an ICT4D initiative targets the poor directly, or indirectly through intermediaries, will depend largely on the technology solution employed. Indeed, an important area of innovation in ICT4D is to exploit the particular strengths of different ICTs by combining them to deliver a more complete communication package. For example, while Internet-based initiatives may be irrelevant if targeted directly to the poor, they can be effective if targeted to community intermediaries that can obtain information from the Internet and communicate it using other ICTs (e.g. radio, television, video, etc.). While the poor *'will only reap the fullest benefits of ICTs when they own and control both the technology and its related know-how'*, the sheer magnitude of the digital divide means that targeting intermediaries is a '*currently-necessary mechanism'*, and will remain so for the foreseeable future (Heeks, 1999).

Demonstrating impact

ICT4D pilot programs should be able to demonstrate positive impact. We measure the impact of an ICT4D initiative in the same way that we measure impact of any other poverty reduction initiative. We need to know who is impacted, how many are impacted, and in what ways are they impacted (either positively or negatively)?

With respect to the specific impact of ICT, the question is the extent to which application of ICT brings competitive advantage in comparison to projects with similar goals that do not use ICT in the same way. Competitive advantage might be achieved by increasing outreach, achieving greater impact through the application of a more effective mode of communication, introducing additional benefits through access to new information sources, or through efficiency gains.

Viable business models

An ICT4D pilot program should be able to demonstrate that it is a viable operation. Sometimes, financial viability is not possible for pilot projects prior to an expansion phase - in these cases, there needs to be a clear business model and strategy to demonstrate how financial viability is to be achieved.

Multi-sector partnerships

Since poverty is massive and complex, a cooperative approach from stakeholders in all sectors of society is needed to combat it. Governments must enact enabling policy and legislation, allocate public resources, and serve as content providers. It will be difficult to expand a pilot program on a national level without the explicit and enthusiastic support of government bodies. The strength of civil

society organisations is their connection with the grass-roots; they are therefore well-placed to implement participatory processes for information and communication needs analysis, strategic planning and evaluation. Private-sector entities can offer management and technical expertise, business acumen, market development strategies, and access to credit.

Effective partnerships involve exploiting the core competencies and strategic interests of each partner, and creating synergies so that the strategic interests of each partner are achieved. These partnerships are often difficult to negotiate and maintain. However, it is difficult to see how any ICT4D pilot initiative can be expanded and replicated to the point where it makes an appreciable impact on poverty reduction, without utilising workable multi-sector partnerships.

Each of the three programs mentioned above (DBI, Drishtee and Grameen VPP) had negotiated and maintained effective multi-sector partnerships.

Conclusion

The ICT4D sector is at a critical juncture. The focus needs to move from small, local 'demonstrator' applications to national and regional expansion and replication. This is, after all, the supposed competitive advantage of ICT - that it can overcome the tyranny of distance and reach, in theory at least, virtually unlimited numbers of people. Unfortunately, many otherwise successful pilot programs are struggling to make the transition. While the reality of the Digital Divide means that expansion will always challenging, a number of programs have been able to expand, reaching thousands, hundreds of thousands and even millions of people.

The major stumbling block to expansion and replication is financing. Very few ICT4D pilot initiatives will be considered appropriate candidates for utilising public sector funding for expansion. Most pilot programs are far too expensive on a per unit basis to justify public sector investment. Some kind of private sector investment will be necessary for most ICT4D initiatives to be expanded. The franchising model has been particularly successful in facilitating private sector involvement, through the investment of many small operators that bring 'entrepreneurial momentum' at the local level.

Some Examples of National / Regional ICT4D Initiatives

1. Equal Access's Digital Broadcast Initiative (DBI)

PRIMARY FACILITATOR: **Equal Access** (http://www.equalaccess.org)

Equal Access is a not-for-profit organisation that delivers critical development-related information to under-served regions through an information infrastructure that combines digital technology innovations with community collaboration, cultural appropriateness and interactive feedback.

PROJECT FOCUS: **HIV/AIDS prevention**

Although the initial pilot program focuses on these issues, the technology infrastructure and community consultation processes associated with this project could be applied to address virtually any educational need.

COUNTRY: **Nepal**

BACKGROUND: (World Bank: AIDS in Nepal)

"Though the absolute number of HIV/AIDS cases is low (adult infection rate 0.5%), Nepal has entered the stage of a 'concentrated epidemic' with HIV/AIDS prevalence constantly exceeding five per cent in one or more high-risk groups, such as commercial sex workers (CSWs) and injecting drug users.

Increasing vulnerability of young people is mainly due to a widening generational and cultural gap between adolescents and the older generation. In many cases, even if girls and women have knowledge of STDs and AIDS their access to protection is restricted as a result of their lower status.

Seasonal and long-term labour migration to neighbouring countries, such as India, is necessary for the economic survival of many households. Thousands live away from their families as migrant

workers. Removal from traditional social structures has been shown to promote unsafe sexual practices, such as engaging in multiple sexual partners and in commercial sex.

Nepal runs the risk of an increased epidemic due to high rates of girl trafficking to India for sex work. It is estimated that there are approximately 100,000 Nepalese CSWs in India.

Immediate and vigorous action must be taken now to prevent further spread of HIV among high-risk groups and stop the infection from taking a foothold in the larger population. Without effective interventions, it is predicted that there may well be a generalised epidemic by the end of this decade."

PARTNERS: **WorldSpace** (http://www.worldspace.com)
Solaria (http://solaria.light.net/solarialn1.htm)
UNDP

Equal Access also works in partnership with community-based organisations (CBOs) such as Village Development Councils and community radio organisations, Communications Corner Independent Production House (http://www.comconnepal.com), Radio Nepal (http://www.radio-nepal.com), and local solar energy systems providers Lotus Energy (http://www.lotusenergy.com).

TECHNOLOGY:

The majority of people living in the developing countries in Asia do not have regular or reliable access to telephony or the Internet. Consequently, Internet-based solutions have had limited success in achieving widespread impact. Even in areas where power and telephone services exist, the high costs of these services, slow connections, lack of relevant content, etc. limit the effectiveness of Internet solutions. Even the print media is of limited value, given the high levels of print illiteracy that exist. To overcome these shortcomings, Equal Access has established the 'Equal Access Asia Development Channel' (ADC) on the WorldSpace Digital Satellite System. ADC is a digital audio broadcast that can be received across Asia. The technology allows a clear digital audio signal to be received by an inexpensive, handheld portable receiver direct from the satellite. This technology is capable of providing, at low set-up and ongoing costs, information to even the most remote locations, independent of local telephony or electricity infrastructure. In selected locations where electricity infrastructure is lacking, the project's solar systems integration partners, Solaria Corporation and Lotus Energy, provide solar power solutions to the project site.

ADC can therefore be a conduit for organisations to provide information to audiences anywhere in Asia on a common platform that is inexpensive, available in remote areas, culturally appropriate and allows communities to benefit from a wide range of content.

The receiver, when linked to a computer, also allows large files of data, video imaging, text and graphics to be downloaded direct from the satellite. Note that signal transmission is one-way only; there is no mechanism for clients to send information via ADC.

PROJECT DESCRIPTION:

Three core teams carry out project implementation:

1. **The Content Group**: a coalition of NGOs, government, community leaders and People Living With HIV/AIDS produce, in local languages, culturally appropriate and entertaining content in a variety of formats including soap operas, facts of the day, interviews and music/song.
2. **The Outreach Team**: CBOs chosen for their depth of experience and established presence in the communities being served. These CBOs orient participants to the program, establish active listening groups and learning centres and conduct discussions following the broadcasts. Participants provide feedback and this information is fed back to the content group.
3. **The Assessment Team**: assesses the efficacy of the projects and sets up feedback loops between community participants and the Content Development Group. The University of California, San Francisco Centre for AIDS Prevention Studies and an in-country assessment and monitoring group collaborate on project assessment. Feedback from participants will provide development organisations with a broadened basis for informed project planning.

OUTREACH:

The first phase of DBI is operative in Nepal with over 400 community-based sites. Programming is also re-broadcast through Radio Nepal and a number of local community radio stations, with a combined audience reach of 18 million (over 80% of the Nepalese population).

Preparation for the expansion of DBI to India, Southeast Asia and Afghanistan is underway.

2. Drishtee.com

PRIMARY FACILITATOR: **Drishtee.com Ltd** (http://www.drishtee.com/)

PROJECT FOCUS: **Governance**

COUNTRY(S): **India**

BACKGROUND:

Approximately 70 per cent of India's one billion people live in rural villages of less than 5000 people. Technology-assisted strategies represent the only realistic hope of improving government service-delivery to these villages.

PARTNERS: **Various local and state governments**

PROJECT DESCRIPTION:

Drishtee is a software platform for enabling governance, commerce, education and health services. It facilitates information interchange within a localised intranet between villages and a district centre. Dishtree services are delivered via Information Kiosks that are owned by local villagers. Each kiosk, located at a prominent central location in its district, caters to the needs of the surrounding villages. Typically, the kiosks are financed through a Government-sponsored loan scheme. User fees are charged at the kiosks for the services provided.

TECHNOLOGY:

Information Kiosks: The Information Kiosks facilitate public access to the services and information offered by Drishtee. Each kiosk computer runs Drishtee application software. The database of the kiosk is updated whenever the kiosk is connected to the district server or the web server. Mail and other messages queued at the Kiosk are uploaded to the District or Web Server.

District Server: The District Server acts as the local content provider, providing data such as commodity prices, etc. It also acts as a sub-administrator processing the requests of the local kiosks, facilitating communication, monitoring kiosks and administering the district database.

Web Server: The Web Server acts at the main administrator of the complete system. It co-ordinates communication between districts and acts as national level content provider.

OUTREACH / REPLICATION:

Drishtee is now active in 5 states and has 225 kiosks in operation.

3. Grameen Telecom's Village Phone Project

PRIMARY FACILITATOR: **Grameen Telecom** (http://www.grameen-info.org/grameen/gtelecom/)

PROJECT FOCUS: **Mobile Phone Access for Rural Villages**

COUNTRY(S): **Bangladesh**

PARTNERS: **Grameen Phone**

Grameen Bank

PROJECT DESCRIPTION:

The Village Phone Program began in 1997. It works as an owner-operated pay phone, providing telephone services in rural areas where no such facilities existed before. It allows the rural poor who cannot afford to become individual subscribers to avail the service. Typically, a (female) borrower of Grameen Bank takes a loan and buys a handset and subscription of the mobile service. VP staff provide training on how to operate the phone and how to charge the users.

- Subscription cost: USD 244 with lease financing provided by Grameen Bank.
- Average billing for the month of January 2003 was USD 106
- Average annual income of a VP operator is around USD 700, which is nearly twice the per capita income of Bangladesh

OUTREACH / REPLICATION:

Presently, there are 25,000 Village Phones in operation in 23,000 villages located in 51 administrative districts(out of a total 64 districts). The initiative is now being replicated in India and Uganda.

Bibliography

Badshah,A. and Jha,S. 2002. *Taking the Expansive View: From Access to Outcome*s. Digital Partners Institute, New Delhi. http://www.digitalpartners.org/pubs/expansive.pdf

Flor,A. 2001. *ICT and Poverty: The Indisputable Link*. SEARCA. Paper for the Third Asia Development Forum on "Regional Economic Cooperation in Asia and the Pacific". Bangkok.
http://www.worldbank.org/html/extdr/offrep/eap/eapprem/infoalexan.pdf

Heeks,R. 1999. *Information and Communication Technologies, Poverty and Develop*ment. Institute for Development Policy and Management. Manchester. http://idpm.man.ac.uk/wp/di/di_wp05.htm

Kemp,M., Mathison,S. and Prasetyo,J. 2002. *Digital Dividend or Digital Divide? A World of Difference*. The Foundation for Development Cooperation. Brisbane. http://www.fdc.org.au/publications/20021107_51.html

Kenny,C., Navas-Sabater,J. and Qiang,C. 2001. *Information and communication technologies and Poverty.* World Bank. Washington D.C.
http://www.worldbank.org/poverty/strategies/chapters/ict/ict0409.pdf

Marker,P., McNamara,K. and Wallace,L. 2002. *The Significance of Information and Communication Technologies for Poverty Reduction*. DIFD. London. http://www.dfid.gov.uk/Pubs/files/ict_poverty.pdf

Mathison,S. 2003. *Digital Dividends for the Poor: ICTs for Poverty Reduction in Asia.* The Global Knowledge Partnership Network. Kuala Lumpur. http://www.fdc.org.au/files/ictandpovertyinasia.pdf

Michiels,S. and Crowder,L. 2001. *Discovering the 'Magic Box': Local appropriation of information and communication technologies (ICTs).* FAO. Rome. http://www.fao.org/sd/2001/KN0602a_en.htm

O'Farrell,C., Norrish,P. and Scott,A. 1999. *Information and Communication Technologies for Sustainable Livelihoods*. Intermediate Technology Development Group. Warwickshire.
http://www.rdg.ac.uk/AcaDepts/ea/AERDD/ICTBriefDoc.pdf

OECD. 2001. *Understanding the Digital Divide*. OECD. Paris.
http://lacnet.unicttaskforce.org/Docs/OECD/Understanding%20the%20Digital%20Divide.pdf

Rana,S. 2001. *Using ICT in Development: Perspectives on Nepali Experiences*. MahilaWeb, Kathmandu.
http://www.itcd.net/itcd-2001/papers/doc_pdf/doc_19.PDF

UNDP. 1995-2002. *Human Development Report*. Oxford University Press. New York.

Useful Links

Asia Development Bank ICT4D Strategy	http://www.adb.org/Documents/Policies/ICT/
Development Gateway (World Bank)	http://www.developmentgateway.org/
Digital Opportunity Initiative	http://www.opt-init.org/
e-ASEAN Task Force	http://www.e-aseantf.org/
Global Knowledge Partnership Network	http://www.globalknowledge.org/
WSIS ICT for Development Platform	http://www.ict-4d.org/
Pan Asia Networking	http://www.panasia.org.sg/
UN ICT Task Force	http://www.unicttaskforce.org/index.asp
UNDP APDIP	http://www.apdip.net/
UNDP ICT4D	http://sdnhq.undp.org/it4dev/
UNESCAP ICT Activities	http://www.unescap.org/escap_work/ict/
UNESCO ICTs for Education in Asia/Pacific	http://www.unesco.org/bangkok/education/ict/
UNESCO WebWorld: Communication and Information	http://www.unesco.org/webworld/
World Bank InfoDev	http://www.infodev.org/
WSIS	http://www.itu.int/wsis/