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**for the**

# **Ministry of Information & Communications (MOIC)**

## **Review of International Experience**

*for*

**Study on Increasing ICT Access in Rural and  
Peri-urban Areas of Nepal (PS-4)**

**December 12, 2004**

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The consultants are grateful to MOIC for their permission to make this draft document publicly available. We welcome comments on the draft. Please note that this document is the responsibility of the consultants, and nothing in it represents MOIC's views or commits MOIC in any way.



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## Abbreviations

AMARC	Association Mondiale des Radiodiffuseurs Communautaires
AMUL	Anand Milk Union limited
ASA	Activists for Social Alternatives
BSNL	Bharat Sanchar Nigam Limited
CARD	Computer-aided Administration of Registration Department
CTC	Community Technology Center
DDS	Deccan Development Society
DECT	Digital Enhanced Cordless Telecommunications
DFID	Department for International Development
DTP	Desk Top Publishing
FAO	Food and Agricultural Organisation
GTZ	Gesellschaft für Technische Zusammenarbeit
HIV	Human Immunodeficiency Virus
IADB	Inter-American Development Bank
ICT	Information and Communication Technology
IEEE	Institute of Electrical & Electronics Engineers
ITU	International Telecommunications Union
LAN	Local Area Network
LDC	Least Developed Country
MAP	Mobile Access Point
MIT	Masachusetts Institute of Technology
MP	Madhya Pradesh
NIC	National Informatics Centre
PCtv	Personal Computer Television Telephone
PDR	Peoples' Democratic Republic
SARI	Sustainable Access In Rural India
SEWA	Self Employed Women's Association
TARA	Technology Action for Rural Advancement
TPRC	Telecommunications Policy Research Conference
UNESCO	United Nations Educational, Scientific and Cultural Organization
URL	Uniform Resource Locator
WAN	Wide Area Network
WSIS	World Summit on the Information Society
WiLL	Wireless in Local Loop



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# 1 INTRODUCTION

## 1.1 BACKGROUND

This report is an early deliverable in the project on increasing Information and Communication Technology (ICT) access in rural and peri-urban Nepal. As required by the Terms of Reference, it aims to advise the Government on recent experience in rural telecommunications and ICT sector in other countries, with particular emphasis on experience which may be relevant in the Nepalese context.

In Section 3 we present selected case studies on rural ICTs, and in Section 4 the main conclusions from international overview studies of the use of rural ICTs for poverty reduction. This follows the approach of last year's report to MOIC produced as part of PS-2: *Information and Communications Technologies in Rural Nepal - enhancing access and services delivery*. The relevant parts of this earlier report are reproduced here for convenience as Annexes 1 and 2.

As in last year's study, we use a broad definition of ICT, which includes not just Internet, computers and fixed and mobile telephones, but also radio and television. The new cases included here have been chosen from a large field using the following criteria:

- Recent experience in a country sharing some characteristics with Nepal.
- Thorough and objective information source available, preferably including personal contact for supply of up-to-date details.
- Learning available which seems relevant to the challenges faced in Nepal.
- Illustrating a variety of possible approaches to rural ICT provision.
- Meeting MOIC's specific requests.

In addition, through our team member Dr Roger Harris, we are fortunate to benefit from an early view of the findings of the ongoing UNDP APDIP (Asia Pacific Development Information Programme) project "*Information and Communication Technologies for Governance and Poverty Alleviation: Scaling up the Successes*". This is presented in Section 2.

## 1.2 LEARNING FROM INTERNATIONAL EXPERIENCE

When studying international experience, it is important to bear in mind how young most projects in this area are. Even the oldest and best established rural ICT projects tend to date only from the mid-1990s. A recent proliferation of new projects means that most are much younger. Usually they need at least a couple of years to get set up and start to show results. This means that in a great many cases, it is simply too soon to look for useful learning.



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It is also important to remember that many projects are using expensive prototype technology. Routine use of the technology in the developing world will usually depend on large cost reductions, which require volume production. But volume production will only happen if it is justified by commercial demand, which means finding large markets for the technology. This may be years away, or may never take place.

Although technology itself is international in scope, the applications which appear in case studies are specific to the circumstances and culture of the place in question. Nepal is always different. Even apparently relevant approaches could turn out quite differently if replicated in Nepal. Luckily, by now Nepal itself has quite a body of experience with rural ICTs. The Sector Overview report presented in parallel with this report aims to present some learning from Nepalese experience.

For all these reasons, the findings of an International Overview can only be a minor element in working towards a rural ICT strategy for Nepal. Its main use may be in stimulating new ideas that could work in Nepal.

## 2 SCALING UP THE SUCCESSES FROM INDIAN EXPERIENCE

The Asia-Pacific Development Information Programme (APDIP) has embarked on a research study of 19 Indian projects involving ICTs for governance and poverty alleviation. The study is called *Information and Communication Technologies for Governance and Poverty Alleviation: Scaling up the Successes*. APDIP is an initiative of the United Nations Development Programme (UNDP) that aims to promote the development and application of ICTs for poverty alleviation and sustainable human development in the Asia-Pacific region.

The research goal is to document the lessons learned in establishing and operating community ICT projects for e-governance and poverty reduction in India with the intention of highlighting those factors that are capable of either fostering or inhibiting the scaling up successful projects to wider populations. The study evaluates the processes, technology, participation, services, business models, and policy dimensions surrounding the implementation and operation of the selected projects. The projects studied are a mix of those that are concerned with improving government services and others that are focussed on income generation and enterprise support. Some attempt both. They are listed and briefly described in Annex 3.

There was a survey of 2,100 respondents, of which 80% were male, 58% had attended lower secondary school or below, 33% were employed in agriculture, and 83% earned Rs 5,000 (US\$110) or less per month. A preliminary analysis of the survey data indicates that around half the respondents had used an ICT centre more than five times in the previous year and 81% of them had found it very useful or extremely useful. 92% placed high or very high value on the services of the centre from which 65% received increases in incomes ranging from reasonable to significant.



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In terms of empowerment, the centres did not seem to fare so well; 65% of survey respondents felt that the centres had only helped slightly or not at all in voicing their opinions and around 70% felt that they had either not helped at all or only slightly helped them make useful contacts or build relationships. However, 81% were satisfied or very satisfied with the services they received and 92% felt that more services should be added, especially government services. More than 84% felt the services were worth the charges that were made to them.

These examples from India suggest desirable development strategies that encompass one or both of two general areas:

- the improved delivery of government services, where such services are comparable to those available in the Indian examples; and
- support for the agricultural economy.

The first type is characterised by implementations of; Gyandoot; Bhoomi; Community Information Centers (Sikkim); Tamil Nilam Touch Screen Project; FRIENDS Kerala; Mahiti Shakti; and Computer-aided Administration of Registration Department (CARD), Hyderabad.

The second type is characterised by the implementations at; the Anand Milk Union; Tarahaat; E-Chaupal; Warna Wired Villages; and India Agriland. Other projects offer a mix of the two; Janmitra, Jhalawar (Rajasthan); SEWA, Ahmedabad (Gujarat); and. N-Logue Telecentres Project, Madurai (Tamilnadu).

In all cases, the development objectives seem to have been clearly targeted in advance of the installation of the technology, and suitable partnerships had been formed in order to achieve the required outcome. At the same time, close community engagement has been achieved and there are strong indications that the implementations are responsive to locally expressed priorities whilst working within an overall general framework.

However, we must be cautious when interpreting these findings in the context of Nepal, remembering that Indians on average are both better-off and more highly educated than the Nepalese<sup>1</sup>.

### 3 SELECTED CASES

The cases chosen for presentation here are:

- The Gramin Sanchar Sewak scheme from Madhya Pradesh in India, where postmen have been carrying mobile phones on their delivery rounds for use as “mobile PCOs” (Public Call Offices) by villagers. This pilot scheme appears to be going well and is a good candidate for replication in Nepal where mobile coverage is available.

<sup>1</sup> World Bank 2000 figures: GNI per capita \$450 for India, \$240 for Nepal; adult illiteracy 44% for India, 58% for Nepal.



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- The Rurtel scheme for rural telephony in Laos. A statistical study of matched pairs of households with and without telephony access shows that provision of telephony access has a significant positive effect on incomes.
- The Jhai Foundation's provision of computers to rural schools in Laos. Some installations are already achieving financial self-sufficiency.
- The DakNet Mobile Ad Hoc Connectivity installation in Uttar Pradesh, where bus-mounted Mobile Access Points touring the area permit rapid data exchange to village kiosks equipped with suitable computers. The economics of this model point towards it being possibly applicable in some parts of Nepal.
- Examples of e-post implementation in India and Bangladesh. E-post is of special interest in Nepal because of its potential for improving the two-way communications service which is most used by many rural residents. However, services elsewhere appear to be rather expensive and to rely on commercial mailings to break even.

Finally, we include a look at a multifunctional item of terminal equipment currently under development, the PCtv. The aim is to combine video, audio and text communications in a single low cost device with a simple user interface suitable for illiterate users.

### 3.1 GRAMIN SANCHAR SEWAK SCHEME<sup>2</sup>

In December 2002, BSNL Madhya Pradesh launched a scheme to provide mobile PCO service. Initial coverage was of 433 villages spread in 35 Short Distance Charging Areas (local call areas), covered by 72 postal delivery rounds. Since launch, service has been extended to 14 more Secondary Switching Areas, using another 64 postal delivery rounds.

The postmen carry small integrated CDMA WLL equipment with charging display facility. Calls are charged at normal rates, plus a service charge of Rs 2 per call. A similar fixed service charge is made for receiving incoming calls. Each postman will also deliver messages from incoming calls received before his arrival in the intended recipient's village.

The postman gets a 20% commission on total revenues generated and keeps the service charges and incoming call charges. So far the service has been working well, with postmen still able to complete their usual postal duties. The Madhya Pradesh pilot is already being copied elsewhere in India, including in Jammu and Kashmir.

This operational model looks well worth the Nepal Postal Department exploring for application within wireless telephony coverage, which is now expanding. But in planning services it will be important to consider:

- The prices at which calls can be offered to customers – can a margin be available to cover Postal Department costs, while prices overall remain acceptable to villagers?

<sup>2</sup> Main sources: BSNL Madhya Pradesh, personal communications with Mr Lalit Mohan Sanwal of BSNL MP.



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- The frequency and predictability of postmen visiting each served locality. It will be hard for people to use a mobile PCO service if they have little idea when it will next be available.
- Likely competition from private entrepreneurs, who can get a phone and resell service once a locality comes within wireless coverage.

### 3.2 RURAL TELEPHONY IN LAOS<sup>3</sup>

Laos is similar to Nepal in being a landlocked Least Developed Country in Asia, still strongly dependent on agriculture, with per capita income only a little higher than Nepal's<sup>4</sup>. Population density is low and the terrain is generally hilly.

The German government has been providing aid to Laos for rural telecommunications (the RurTel project) since 1992. Completion is planned for 2004, by which time 73% of the 128 rural district capitals should have been provided with telephone exchanges, each of 24 to 48 lines capacity.

In 2000, when only 40% of the Districts had yet been reached, a German-funded research team surveyed use of the facilities provided, and carried out a matched analysis between households with and without telephony access. Key findings included:

- Annual revenues per line were DM 1,700, well above initial projections of DM 780.
- 45% of people surveyed from villages with telephony access were using the phone. Users on average made 3 local calls and 6 long distance calls a month. Some usage was not charged for (eg if a phone at work was used). Paying users on average were spending 3.7% of their total cash expenditure on phone use (and three times that amount on transport).
- There is a positive correlation between phone use and level of education. The occupational categories with the lowest proportions of users were agriculture and fisheries (both 15%).
- There is a higher proportion of phone users among higher income groups, over 80% among those with incomes over US\$200 a year. But even among the lowest income group identified (up to US\$100 a year), 27% of respondents used the phone.
- Reasons given for non-use were predominantly "see no need for it" (86%). Only 4% said the phone was too expensive. Other reasons given were "too far away" and "don't know how to use".

<sup>3</sup> Main sources: *Information and Communication Technologies for Development: a five-country review*, GTZ 2002; *ICTs and Rural Development: examples from Lao PDR*, paper for 2002 TPRC by Gi-Soon Song and Romeo Bertolini.

<sup>4</sup> World Bank 2000 figures: GNI per capita \$290, adult illiteracy 52%.



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- Both users and non-users expressed a wide range of information needs, many of which users were able to satisfy by using the phone. Non-users may not have understood the benefits that a phone could deliver.
- Matched analysis between user and non-user households showed that telephone use had a positive effect on household income (measured by consumption) of more than 20%.

The implication of this study for Nepal is that, as in Laos, the telephone will be found to be “an appropriate rural technology” whose costs of use will be more than repaid for most people by identifiable financial benefits. When phones are first provided in an area, awareness campaigns on phone use may be worthwhile.

### 3.3 JHAI FOUNDATION COMPUTERS IN SCHOOLS<sup>5</sup>

The Jhai Foundation is a US-supported non-profit foundation with two major ICT projects in Laos: the Internet Learning Centers and the Remote IT Village Initiative. As well as ICT, the Foundation is involved in general economic development in the villages where it works, and in particular with a coffee co-operative. Its work is based on an ethic of reconciliation (following hostilities) and grows through close involvement with the communities concerned. There are now four Jhai Internet Learning Centers in Lao high schools, one in a town and three in rural areas. Each school gets 10 personal computers linked by a Local Area Network to each other and to a range of peripherals. The primary use of the facilities is 10-week courses in basic computer and internet skills. Use is free to school students, and available to the public on a charged basis outside school hours.

The Remote IT Village initiative is linking computers in five remote villages wirelessly to each other and to the Internet Learning Centers. A new, rugged design of personal computer is being made especially for the purpose. Power is provided by solar panels or by a stationary “bicycle” which feeds a battery. For the time being the system remains a prototype with each computer being hand-assembled. Factory production, which will substantially reduce costs, will require an order for at least 10,000 units.

What particularly marks out the Jhai Internet Learning Centers from a number of other similar initiatives is their success in moving towards full financial viability. This is attributed to a combination of factors, including:

- Business as well as technical training for responsible staff.
- Sensitivity towards local needs, coupled with flexibility to provide outside support to meet those needs at any time and for an indefinite period.

The founder, Lee Thorn, sums up Jhai’s approach as follows:

“Jhai is not focused on typical development goals. Jhai is interested in making friendships and serving their friends with their whole selves.”

<sup>5</sup> Main sources: Jhai Foundation <http://www.jhai.org>, including personal communication from Lee Thorn; case study material provided on World Resources Institute Digital Dividend website at [http://www.digitaldividend.org/pubs/pubs\\_02\\_jhai.htm](http://www.digitaldividend.org/pubs/pubs_02_jhai.htm).



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Jhai's combination of generous and flexible outside support with charismatic local leadership, and basing Internet provision in High Schools, sounds like a model that could also work in Nepal – if the right people and funding sources come forward.

### 3.4 MOBILE AD HOC CONNECTIVITY: DAKNET<sup>6</sup>

The DakNet installation in a 100 sq km area near Lucknow in North India has attracted a good deal of attention. It uses new “hot-spot” wireless technology to provide occasional broadband connectivity. Mobile Access Points (MAPs) are mounted on buses which travel around the area on their normal business. When a MAP stops near a wireless-equipped terminal point (typically, a computer in a public kiosk or school), a rapid exchange of data takes place between the two. For example, outgoing emails are collected and incoming emails are delivered. When the bus stops near its base which has a permanent Internet connection, a similar data exchange takes place so that, for example, emails are sent and received.

The MAP can also be mounted on motorcycles (as in the Cambodian Motoman pilot service) or even on a bicycle (as in Yuri Gitman's Magic Bike, originally designed for use in New York) or ox-cart. The running of the vehicle generates the power needed for the MAP unit to operate.

The cost of an MAP is estimated at US\$580, and the cost of equipping an existing village kiosk to communicate with an MAP at US\$185. Assuming that one bus-mounted MAP can serve 10 villages, this works out at a connectivity capital cost of \$243 per village, which is certainly low compared with two-way alternatives. Operating costs are assumed to be very low, as the buses are running on their normal routes.

Proponents of the system say that occasional broadband connectivity is a better fit to rural requirements than permanent voice telephony, because poor rural residents will know few people with whom they can have a telephone conversation. They also believe that the cost of suitable interactive terminal devices (providing simple functions like email or voicemail) is falling rapidly, and could soon be as low as US\$25. A village voicemail system is under development.

It is worth noting an estimate<sup>7</sup> that an Indian village with a population of around 1,000 can sustain a village information kiosk financially, given corDECT wireless coverage and management support such as is provided by the rural service provider n-Logue. The main costs in this case are the initial investment in a computer. As above, adjustments would need to be made for Nepalese conditions before applying any such estimate to Nepal.

<sup>6</sup> Main sources: *DakNet: rethinking connectivity in developing nations*, by Alex Pentland (MIT Media Laboratory), Richard Fletcher and Amir Hassan (First Mile Solutions), IEEE Computer Outlook, January 2004 and other materials at <http://www.firstmilesolutions.com>

<sup>7</sup> *n-Logue: the story of a rural service provider in India*, by Ashok Jhunjhunwala, Anuradha Ramachandran and Alankar Bandyopadhyay, Indian Institute of Technology, The Journal of Community Informatics, (2004), Vol. 1, Issue 1, pp. 30-38



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This is certainly an interesting development for Nepal. Its successful deployment elsewhere has depended on existing village kiosks or computers in schools, with an existing client base using established applications (eg India's well-known e-governance applications).

It is obviously easier to serve relatively densely populated areas that are reached by roads and served by public transport. Of course, similar conditions normally make it economic to serve the area by cellular mobile, which would provide real-time voice service in competition with the voice message capability of this system.

A useful service to remote hilly or mountainous areas depends on regular visits by a vehicle, which in Nepal may have to be set up especially for this purpose and will add to the cost. However, there may be parts of Nepal where this type of connectivity will prove appropriate.

### 3.5 E-POST IN INDIA AND BANGLADESH<sup>8</sup>

Following two years of trials at 205 Post Offices in five States, namely, Andhra Pradesh, Gujarat, Maharashtra, Goa and Kerala, nationwide e-post was launched in India in January 2004. About 650 Post Offices have been designated as e-Post Centers covering all districts and major towns. These e-Post Centers are provided with Internet connection, computers, printers and other necessary equipment. Customers can take their documents to any e-Post Center for scanning. All ordinary Post Offices which are not e-Post Centers will accept original documents and forward them to the nearest e-Post Center. Scanned documents may be delivered to any email address in the world, or to another e-Post Center to be printed out and delivered as physical mail to any address in India. The service costs Rs 10 per page per addressee.

Various private services exist, also called e-post, targeting Indians abroad who have access to the Internet. These offer to receive email, print it out and put it in the post to addresses in India, thereby shortening delivery time by the period needed for international carriage.

In most developed countries, a technically similar service has existed for some years, known as "hybrid mail". Because of the high availability of home email in these countries (and the generally acceptable level of ordinary postal service), the main market for hybrid mail is commercial mailers who use the Post Office to print, envelope and deliver bulk mailings. The Indian Post Office is also targeting a similar commercial market in India.

The Bangladesh Postal Department introduced a similar service at a number of Post Offices five years ago. It charges Tk 20 per page. With the spread of cyber cafes which charge a similar amount per hour, people who can use cyber cafes instead of e-post have every incentive to do so, and the Postal Department is coming under pressure to reduce its prices.

<sup>8</sup> Main sources: India Post, Universal Postal Union, Bangladesh Daily News Monitoring Service.



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The Pakistan Post Office appears to be steering a middle course by installing Internet terminals for public use in its larger branches.

Implications for Nepal include:

- The need to think carefully about the business case before investing in e-post. The potential commercial market is much smaller and less developed in Nepal than in India, and it seems unlikely that there would be a large personal market from residents of rural Nepal if prices were pitched at similar levels to those being charged in India and Bangladesh.
- The possibility of linking with postal departments in other countries, in particular in India, for delivery to addresses in Nepal of messages sent from e-Post Centers abroad.
- The possibility of providing physical delivery services to addresses in Nepal of messages sent via the Internet from abroad.

There is an important related potential market for a secure, low cost funds transmission service for remittances from abroad.

### 3.6 THE PCTVT<sup>9</sup>

Carnegie Mellon University is developing a device especially designed for shared use by poor, illiterate people. The PCtv (illustrated below) will combine the functions of a personal computer with purely visual interface, a television with video recorder, and a telephone. The Korean firm Trigem is manufacturing prototypes for \$450 and the aim is to reduce the unit cost to \$250 by 2007. Field trials are starting in India in November 2004 with narrowband wireless dial-up connections. All applications except video mail and video conferencing are expected to work to acceptable standards. The development is planned to improve on the Indian Simputer, a hand-held computer based on Personal Digital Assistants, also intended to be sold at low prices for rural applications, but with primarily textual user interfaces.

However, the PCtv device will obviously come into its own with broadband connectivity. The developers comment that illiterate users have better applications for broadband than do highly educated users, because good quality moving pictures need high bandwidth. The Andhra Pradesh State Government plans to deploy PCtv in a proposed Rs 700-crore<sup>10</sup> broadband project. The broadband project aims to reach Government services up to the village level in a phased manner with the first phase touching up to the district level, the second, mandals and the third, villages.

The Andhra Pradesh Government plans to use this broadband network for delivery of a host of services, including Government to citizen and community learning and for telemedicine. About 25 companies have responded to the Government's proposal for this project to be developed through a public/private partnership model. As a part of the eGovernance

<sup>9</sup> Main sources: Carnegie Mellon University, including personal communication from Prasanna Rambhatla.

Andhra Pradesh press release at <http://www.ap-it.com/pctvt.html>

<sup>10</sup> Rs 7 billion or around US\$150m.



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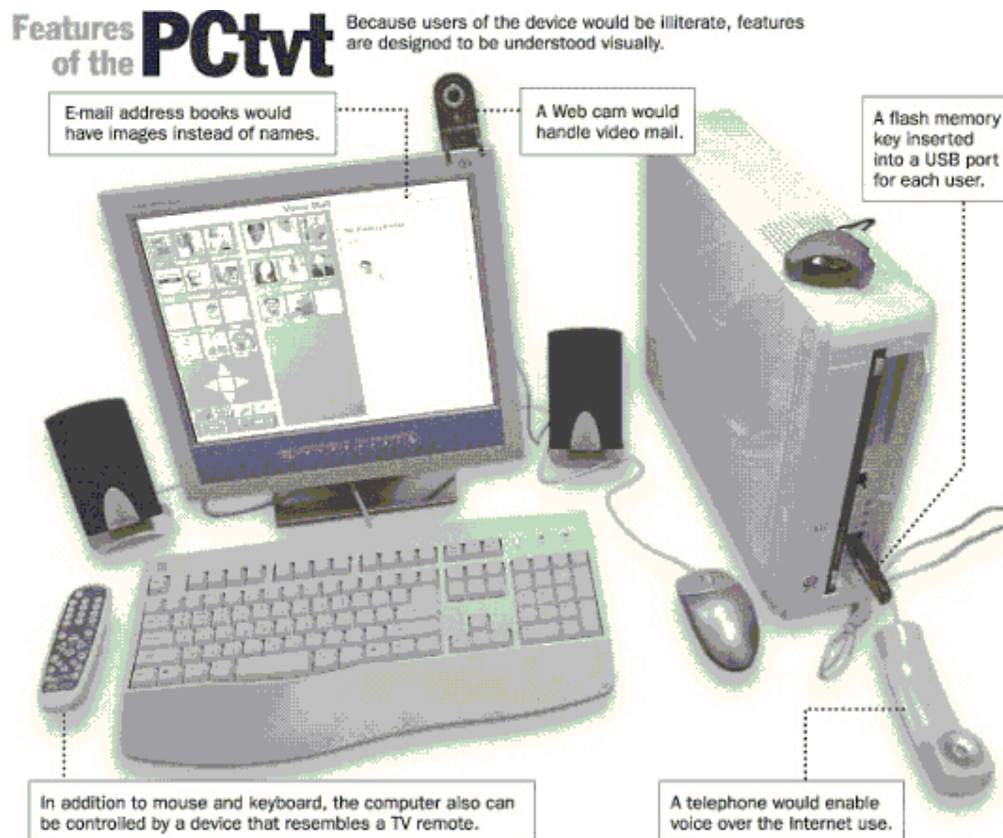
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initiatives, it is proposed to make at least one person in a family computer literate so that the entire family benefits.

The Pctvt is a good example of a collaborative ICT equipment development targeted at developing country markets. There have already been several of these, often based in academic institutions. They are obviously worth watching, in case they do take off. When connectivity is newly provided, it is sensible to think about how it would allow a device like the Pctvt to perform, and about smooth upgrade options. But for Nepal, simpler existing equipment like GSM phones which can be sold for US\$50 new (and less second-hand) seems more likely to be appropriate, at least for several years.



Source: Carnegie Mellon University



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## 4 RURAL POVERTY REDUCTION WITH ICTS

### 4.1 FINDINGS OF RECENT INTERNATIONAL STUDIES

Emerging evidence is suggesting that ICTs are most successful in reducing poverty when they are embedded within effective poverty-reducing strategies that encompass the wide range of social and economic causes of poverty. Successful strategies have to be sensitive to local conditions and subject to the dynamics of community life. As stated in the Plan of Action of the World Summit on the Information Society (WSIS), national e-strategies should be made an integral part of national development plans, including Poverty Reduction Strategies.<sup>11</sup> The WSIS Declaration of Principles points out that:

“ICT applications are potentially important in government operations and services, health care and health information, education and training, employment, job creation, business, agriculture, transport, protection of environment and management of natural resources, disaster prevention, and culture, and to promote eradication of poverty and other agreed development goals. ICTs should also contribute to sustainable production and consumption patterns and reduce traditional barriers, providing an opportunity for all to access local and global markets in a more equitable manner. Applications should be user-friendly, accessible to all, affordable, adapted to local needs in languages and cultures, and **support sustainable development.**”

The emphasis on supporting sustainable development is intended here to stress the point that ICTs are not in themselves a development outcome; they are the means for achieving such an outcome, which has to be clearly understood before deploying the technology. The Food and Agricultural Organisation (FAO) points out that “information and communication are recognized as essential components of the development process ... yet information and communication systems are rarely well integrated into development strategies and programmes. The rush to develop Internet access in developing countries, it says, needs to be adjusted to the context of already established and effective communication systems.”<sup>12</sup>

The FAO experience is derived from case studies in Ghana, Uganda and India, which examined the contribution of ICTs to a livelihoods approach to poverty reduction. The underlying principles of the livelihoods approach are people-centred and reflect the diversity of poor peoples’ livelihoods and the need to analyse these in a holistic manner. They stress the inter-relationship between community-level activities and the broader policy and institutional framework. They recognize that people’s priorities and opportunities change and that interventions which seek to reduce poverty must be dynamic and respond to these evolving opportunities. The key recommendations to enhance the contribution of communication and information within livelihoods approaches are:

<sup>11</sup> WSIS, Geneva, Document WSIS-03/GENEVA/DOC/5-E, 10 December 2003.

<sup>12</sup> *A Livelihoods Approach to Communication and Information to Reduce Poverty*, <http://www.fao.org/waicent/portal/outreach/livelihoods/en/live-en.html>



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- *Determine who should pay:* A new consensus is needed on who should pay for communication and information services for poor rural communities.
- *Ensure equitable access:* New systems must deliver the right kind of information in the right format for poor people, to ensure that existing inequalities are not exacerbated.
- *Promote local content:* It may be more useful to promote more information sharing between local institutions than to bring in new information from outside.
- *Strengthen existing policies and systems:* Further work is needed to strengthen communication policies, and new systems should seek to build on existing systems.
- *Build capacity:* Capacity building is needed at all levels, to equip people with the new skills necessary to develop and manage new systems.
- *Use realistic technologies:* The most effective systems use realistic technologies that enhance and add value to existing systems.
- *Build knowledge partnerships:* New technologies provide enormous opportunities to build knowledge partnerships that cross national, ethnic and social boundaries

Results of the FAO analysis indicate that improved information should lead to better decision-making at all levels. Their report tabulates examples of the types of decisions taken at different levels, and which can be enhanced through improved systems for communication in rural communities, as below.

Decision-making level	Decision type	Information required
Rural poor household	Livelihood strategies (prioritisation of livelihood activities and investment decisions)	Availability of inputs & services, market prices, information on health, education and governance, and their institutions and policies.
Producer organizations	Collective strategies (production, processing & marketing)	Information on opportunities and constraints for production and trade.
Local NGO	Design of projects to support the rural poor	Information about existing livelihood opportunities and constraints, and potential support from projects and interventions.
Local government	Local & District policy making (prioritising resource allocation), revenue generation, governance mechanisms etc	Information about local and regional production, nutrition, health and education status, poverty, national policies and processes, and opportunities for economic growth.
Public service providers	Formulating national, district & local technical assistance programmes in production, health, education etc	Context specific information on sectoral and cross-sectoral issues, production systems and constraints, and community needs and capacity.



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Private sector organizations	Assessing market demand for agricultural goods and services, mechanisms to meet them, and increasing income	Market information, production systems and constraints, and new approaches and technologies.
National NGOs	Networking with communities, advocacy work & informed engagement in policy making processes	Local, regional and national policies institutions and decision-making processes, traditional systems, and community needs.
National government	Formulating targeted national policies and strategies for economic growth and poverty reduction	Monitoring national production, health, education and poverty status and trends, opportunities through international trade, livelihood strategies, resources and distribution.
International Donor agencies	Setting priorities for donor assistance programmes	Monitoring national and global production, health, education and poverty status and trends, national governance and capacity to deliver policies and services.

This theme is advanced in research by UNESCO suggesting that strong links between social and technical networks are highly important for the development of community based ICT initiatives to improve the conditions of the poor and marginalized.<sup>13</sup> The research was conducted in nine South Asian locations, using various technologies, including computers and the Internet but also radio and video.<sup>14</sup>

- Tansen, Palpa, Nepal
- Sitakund, Chittagong, Bangladesh
- Darjeeling, India
- Nabanna/Baduria, West Bengal, India
- Seelampur, New Delhi
- Jakar, Bhutan
- Tamil Nadu, India
- Uva, Sri Lanka
- Namma/Budikote, Karnataka, India.

More empirical evidence of the need for a poverty-centric approach to the use of ICTs for poverty reduction comes from an analysis of nine Asian projects and proposes a set of best practices. These are derived from a number of sources including reflections on the nature of poverty, community development principles and practices, theories of communication and learning, and observations from ICT case studies. The best practices for ICT for poverty reduction initiatives, they say, will generally meet the following criteria:<sup>15</sup>

<sup>13</sup> Slater, D. and Tacchi, J., *ICT Innovations for Poverty Reduction*, UNESCO, New Delhi, 2004. Available at <http://cirac.qut.edu.au/ictpr/downloads/research.pdf>

<sup>14</sup> *ICT in the Hands of the Poor*. <http://ictpr.nic.in/>

<sup>15</sup> *ICT for Poverty Reduction in Asia*. The Global Knowledge Partnership, Kuala Lumpur, Malaysia. [http://www.globalknowledge.org/gkps\\_portal/view\\_file.cfm?fileid=1279](http://www.globalknowledge.org/gkps_portal/view_file.cfm?fileid=1279)



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*Target group:* the poor.

*Application:* critical issues for poverty reduction.

*Impact:* demonstrate positive impact and absence of negative social impact.

*Outreach:* immediately expandable or replicable, at low marginal cost.

*Inclusiveness:* gender-sensitive approach, community engagement.

*Sustainable:* organisationally and financially.

*Partnerships:* government, civil society, private sector, academia, and networks.

*Technology:* combine ICTs to construct a complete communication package.

The case studies examined were:

- Taninet, Malaysia
- China Central Radio And TV University
- Internet Learning Centres, Jhai Foundation, Lao PDR
- [E-Pek@K](#), Malaysia
- Gender Evaluation Methodology, Global including Asia region
- Digital Broadcast Initiative, Nepal, Afghanistan, India, SE Asia
- The Electronic Helpline on HIV/Aids, India
- Kothmale Community Radio, Sri Lanka
- Drishte And The Gyandoot Project, India

Another observer also aligns the use of ICTs for poverty reduction to the multiple and mutually reinforcing causes of poverty, adding that the role of ICTs in poverty reduction is through their catalytic and leveraging effects on income opportunities, educational and health services, and welfare provision. ICT benefits can be realized mainly through a holistic approach. A pro-poor ICT agenda should be pursued in line with a pro-poor agenda in other sectors like education, health, and rural development.<sup>16</sup>

## 4.2 A DEVELOPMENT-LED APPROACH

Drawing on these observations, it is possible to align the use of ICTs for development to the much longer period of ICT use in the corporate world. As ICTs became strategic tools in the competitive armoury of international business, i.e. computers and the Internet became tools to make money rather than reduce operating costs, so it became clear that the technology had to be embedded into effective business strategies if it were to succeed. The technologies are necessary but insufficient on their own to achieve sustained advantage. As the previous examples demonstrate, this principle is equally applicable to the use of ICTs in development in general and in poverty reduction in particular. The following diagram, which is derived from the business world of ICTs, illustrates the sequence of strategic planning that leads to the most effective use of ICTs in development.

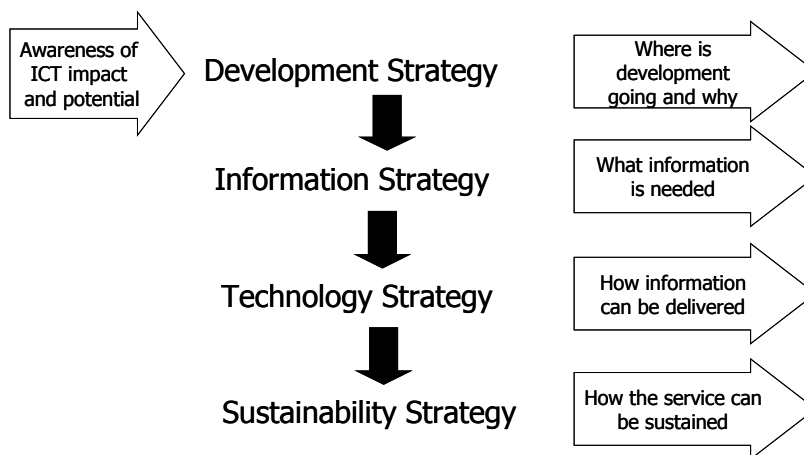
<sup>16</sup> Hanna, N. *Why National Strategies are needed for ICT-enabled Development*  
[http://www.apdip.net/documents/policy/misc/policy\\_strategy1.pdf](http://www.apdip.net/documents/policy/misc/policy_strategy1.pdf)



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The general rule is that the application of ICTs to development should begin with a development strategy. From that, an information plan for implementing the development strategy can be derived and only out of that should come a technology plan and a plan for its sustainability. It sounds simple and intuitive yet it is easy to find and recognize implementations that start the other way round, by beginning with the technology and working back to the development. While the strategic thinking can be informed by an appreciation of the capabilities of ICTs, it is essential to have clear development targets that are specific to the context before the form of use of the ICTs is defined.

Additionally, as the UNESCO research indicates, in considering the development strategy, bottom-up, demand-driven development objectives are usually preferable to top-down, supply-driven objectives, so that goals begin with an appreciation of the needs of development recipients as they would themselves express them. From a clear statement of the development strategy, an information plan is drawn, which relates to the decision-making approach of the FAO. This will set down the information resources required to achieve the development strategy. Again, this plan can be influenced by the capabilities of ICTs, but it should not be driven by the technology.

Finally, technology plans can be made (for the type and quantity of technology, and how to sustain it), that can deliver the information resources required for lasting achievement of the strategy. Although such an approach is only common sense, there are many examples of technology-related development projects that are technology-driven, top-down and supply-driven, and they often result in sub-optimal outcomes because of this.<sup>17</sup>

<sup>17</sup> Harris, R.W., *Information and Communication Technologies for Poverty Alleviation*, one of the series of e-Primers for the Information Economy published by UNDP-APDIP. <http://eprimers.apdip.net/series/info-economy/poverty-toc>.



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### 4.3 TARGETING A DEVELOPMENT STRATEGY FOR NEPAL THAT WILL REDUCE POVERTY

Interactions with rural communities in Nepal point to the prevalent desire for improved trade opportunities through better information on agriculture and small-scale enterprise and improved market intelligence. Increasing the low levels of trade literacy that exist in rural and peri-urban Nepal accords with the livelihoods approach favoured by FAO. Better and more balanced trade relations can have a direct impact on poverty through reducing the imbalances that exist between urban buyers and rural sellers. In rural trade, there are many sellers of a small number of products to a small number of buyers, conditions that are the opposite of urban trade and which make it hard to reduce rural poverty. Electronic commerce that is pro-poor can help reduce these imbalances and contribute towards poverty reduction.

E-commerce is concerned with doing business electronically. Its principal components are: electronic markets, electronic information exchange and electronic funds transfer. The rural economy is mainly made up of small and micro-sized enterprises, dealing in agricultural and related products. Their rural locations tend to isolate them from information sources relating to livelihood aid and enterprise opportunities. ICTs can help by fostering cooperation among large numbers of small producers who are physically distant from each other, and by rapidly spreading market intelligence over wide areas at a low cost. The table below lists characteristics that most rural areas share and shows how ICTs can be used for reducing poverty by promoting production, trade and commerce in a rural-urban setting.<sup>18</sup>

<sup>18</sup> Taken from *Assessing the Feasibility of ICT as a Development Instrument for Rural-Urban Linkages in Nepal* (SP/NEP/02/002) in collaboration with the Rural-Urban Partnerships Programme (RUPP) (NEP/01/020), under Support Services Policy and Programme Development (SPPD) - Strategic Plan of Action.



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Characteristics shared by most rural areas	Effecting the Principal Components of E-Commerce		
	Electronic Markets	Electronic Information Exchange	Electronic Funds Transfer
Shortage or absence of public services and health and education services.	Private health and education providers can reach wider markets in rural areas.	Information on health and education can be disseminated much more widely.	Facilitates trade in information services.
Shortage of qualified technical staff.	Promotes trade in technical expertise, which can be rural-rural trade.	Overcomes isolation from sources of technical information.	Promotes trade in technical expertise, which can be rural-rural trade.
Geographical or topological features that militate against the establishment of a telecommunication network at affordable cost.	New ICTs that are indifferent to terrain and climate are becoming more affordable.		Remittances can be transferred to remote locations that have no financial services. Promotes trade that might not have been possible otherwise. Products can be marketed widely and payment can still effected remotely, if there is no local facility.
Harsh climatic conditions which impose severe equipment constraints.	Ruggedised equipment is available and can contribute to disaster relief programmes.		
Limited economic activity, centred primarily on agriculture, fishing and cottage industries.	Opens up new markets for existing and new products. Digital trade in digital goods is indifferent to geography.	Reveals diversification opportunities. Delivers training in the skills required to act on them.	
Low per capita incomes, generally well below those in urban areas.		Swings the balance of trade more in the favour of rural producers.	
Low population density.	Exposes partnering potential, for co-operatives and collective trade negotiations.		
High levels of traffic per telephone line due to the inadequacy of telecommunication services and the large numbers of users per line.	Shared communication means markets can include large numbers of people with relatively few devices.		

## 5 FURTHER READING

*Assessing The Need And Potential Of Community Networking For Developing Countries: A Case Study From India*, Christopher Blattman, Robert Jensen and Raul Roman, February



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2002. Available on line at Sustainable Access In Rural India website,

<http://edevelopment.media.mit.edu/SARI/sari-press.htm>

Includes results of a demand survey carried out in Madhurai District in Tamil Nadu.

UNESCO *Meta-survey on the use of Technologies in Education in Asia and the Pacific* by Glen Farrell and Cedric Wachholz, 2003, 272 pages. Full report or individual country summaries available at

<http://www.unescobkk.org/education/ict/resources/JFIT/metasurvey/asiemap.htm>

*Connected for Development: Information Kiosks and Sustainability*, UN ICT Task Force Series 4, edited by Akhtar Badshah, Sarbuland Khan and Maria Garrido. United Nations Department of Social and Economic Affairs, November 2003. Available at <http://www.unicttaskforce.org>. 268 pages; includes 17 general chapters by various experts, 12 case studies and a summary of the findings of global research by Digital Partners into telecentre models.

*Annual Report For 2003-2004: Innovative Solutions For The Management And Financing Of Universal Service And Universal Access Policies*, ITU-D Study Group 1, September 2004. 30 pages. Overview of international experience in funding universal access to ICTs.

*Analysis of replies to the questionnaire on rural communications*, ITU-D Study Group 2, February 2004, 94 pages. Material from 52 mainly low-income countries.

*Information and Communication Technologies and Development: Help or Hindrance?* 70 pages, September 2003, by Richard Curtain for AusAid. A critical look based on analysis of 100 ICT projects in the Asia-Pacific region.

*Information and Communication Technologies for African Development: an assessment of progress and challenges ahead*, 370 pages, 2003, UN ICT Task Force Series 2. Edited by Joseph O. Okpaku.



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## ANNEX 1 PREVIOUS REVIEW OF RURAL ICT EXPERIENCE IN OTHER COUNTRIES

Reproduced from PS-2 report by A Wirzenius Teleplanning Ltd: *Information and Communications Technologies in Rural Nepal - enhancing access and services delivery*, November 2003.

There is by now extensive experience available around the world and a huge literature relating to the use of ICTs, and especially electronic ones, for rural development. It is natural that easily available information on such projects gives an impression of success – people are much more likely to publicise successes than failures. To get a balanced and relevant picture, this sub-project has therefore been focused on:

- an overview of available large-scale evaluations of such projects, which offer general conclusions and guidelines for success;
- a closer look at a few specific projects which others have studied in depth.

### Evaluations of experience in a range of countries

In Annex 2, we provide:

- brief summaries of key conclusions of 5 substantial reports (mainly carried out by or for international finance or donor organisations)
- bibliographic details and an outline of the contents of a further 10 relevant reports.

These 15 reports represent the most useful parts of a much larger literature which was surveyed.

Overall conclusions from this exercise include:

- There is now a great deal of specific experience available of rural ICT projects in developing countries – much of it published, and much more which can be obtained through skilled individuals with hands-on experience.
- Successful rural ICT projects, like any other projects, need to be well managed. Among other things, this means careful planning, local support and preferably local leadership, co-ordination and integration with other projects, properly trained staff and adequate resources.



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- Novelty and glamour have sometimes led to ICT applications being "over-hyped" and pursued for their own sake. But for the most part, ICT is valuable as a development tool rather than as an end in itself.
- Internet has become an essential part of nearly all development projects, with huge benefits in both efficiency and effectiveness. The question is not "Can the project afford Internet access?" but "Can the project afford to proceed without Internet access?"
- Where rural people have direct access to Internet, people who benefit the most tend to be younger and better educated.

Conclusions relating specifically to rural telecentres include:

- Simple shared telephones are commercially successful almost everywhere.
- Sustainability of rural multipurpose telecentres presents a major challenge. Often there is little demand for advanced services, especially if they are priced at a commercially realistic level. The location of rural telecentres is critical. They are much more likely to be used in places that many people have to visit anyway for other reasons, such as a market. A less busy location like a school (out of hours) may be more spacious and pleasant, but still less used.
- Another critical success factor is the involvement of local people in deciding details like the services to be supplied by their telecentre (e.g. should it have a photocopier?), opening times and charges.
- A "cluster" of telecentres in a small area, enabling staff to share problems and experiences, supports the success of each individual telecentre.

Findings of the literature survey are also reflected elsewhere in this paper.

## Examples of relevant projects

### Rural telecentre in Jakar, Bhutan

The International Telecommunications Union (with UNDP funding) set up a rural telecentre in 2000 in Jakar, a remote village in Bhutan<sup>19</sup>. So far, the local people have made little use of the facilities. It is not yet providing many of the services that could be of interest to them. The main potential users seem to be businesses rather than households. Due to a gap in funding, the centre closed.

Services identified by the report as of potential value to users include:

<sup>19</sup> *Introducing IT in Bhutan – a case study of a rural telecentre*, Daniel Grankvist, Uppsala University, 2000, 58 pages. Online at <http://www2.itu.or.th/telecenters/jakar/>



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- Voicemail
- Post-e-mail
- Online advertisements (with e-mail response mechanisms) for local businesses to reach out more widely
- A local website with links to all local traders' advertisements
- Classes, especially on spreadsheets and accounting software
- A CD-ROM library

Problems faced by the centre and which need to be addressed include:

- Unreliable and variable power supply
- Low bandwidth leading to slow connection
- Lack of local software and hardware support
- Lack of awareness among local people of facilities offered
- Local people are busy and have not been involved in developing the telecentre
- Not enough space or enough computers for classes
- Poor location and inadequate opening hours
- Inadequate dedicated management attention

### Local radio station in Kothmale, Sri Lanka

In Kothmale, Sri Lanka<sup>20</sup>, a local radio station (part of Sri Lanka Broadcasting Corporation) is linked to the Internet. Local people can visit the station or telephone their enquiries and have the answers (found using the Internet) broadcast back to them. The radio station is also used to transmit personal messages, e.g. that a child returning from school should go to a friend's house as there will be nobody at home. The service is extremely popular, but relies on external funding and volunteer labour.

This pioneering venture has attracted much international attention. Recommendations of a recent ethnographic evaluation<sup>21</sup> of the project included:

- Explore options for achieving greater autonomy for the centre, and for diversifying its funding sources
- Provide career paths for staff
- Consider ways of reaching all sections of the community, including in particular the poor Tamil estate residents (who are cut off by poverty, language, and cultural restraints)
- Increase local awareness of the project (using a dedicated community worker)
- Build users' functional English language skills
- Develop linkages among the different media used, in particular moving into true Internet radio

<sup>20</sup> The project's own website is at <http://www.kothmale.net/>

<sup>21</sup> *Ethnographic Monitoring and Evaluation of Community Multimedia Centre - A Study of Kothmale Community Radio Internet Project, Sri Lanka*, Don Slater, Jo Tacchi, and Peter Lewis, funded by DFID in collaboration with UNESCO, 2003, 67 pages



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- Work towards taking the centre out to its users; ideally, put an entire mobile multimedia centre into a van (including radio programme production, computers, telephone and Internet connections)
- Partner with schools, with a special emphasis on training teachers
- Accredite the qualifications obtainable through the centre (so study there can lead to a recognised certificate)

### Internet kiosks in North India

In the two relatively prosperous North Indian states of Punjab and Haryana, contrasting projects TARAhaat and Drishtee<sup>22</sup> have aimed to provide Internet kiosks on a commercially sustainable basis. TARA (Technology Action for Rural Advancement) has franchised 8 kiosks each with around 5 computers. The investment per kiosk is up to 300,000 IR. Both franchisees and users are generally middle class. Drishtee's kiosks are more numerous but each smaller and less costly to set up, and are targeted more actively at low-income groups. The kiosk entrepreneurs are also often low-income youths, as the amount required is below a standard loan threshold.

Both projects have run into problems with connectivity, and have developed ways of functioning on a stand-alone basis. TARAhaat has been using its computers to offer training in both computer and English-language skills. Drishtee's main service is passing completed forms on to Government (these relate to licensing for vehicles and drivers and certificates for below-poverty-line or old-age-pension status, plus complaints). Drishtee has arranged for service requests from its unconnected kiosks to be collected and delivered by bus to a centre with connectivity, where they are processed.

Both projects are now seeking new revenue sources. TARAhaat is finding it hard to compete with many other training providers, while Drishtee is suffering from the low frequency of the transactions that it handles. Both are expected to diversify into other service areas.

A promising strategy may be partnership with agricultural purchasing companies, who might be able to reduce the use of middlemen if farmers became aware of current produce prices through kiosks.

<sup>22</sup> *Information technology and broad-based development – preliminary lessons from North India*, P D Kaushik and Nirvikar Singh, July 2002, 33 pages. Online at [http://econ.ucsc.edu/faculty/boxjenk/kaushik\\_singh.pdf](http://econ.ucsc.edu/faculty/boxjenk/kaushik_singh.pdf)



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## ANNEX 2 PREVIOUS INTERNATIONAL LITERATURE REVIEW

Reproduced from PS-2 report by A Wirzenius Teleplanning Ltd: *Information and Communications Technologies in Rural Nepal - enhancing access and services delivery*, November 2003.

### World Bank

A World Bank infrastructure economist<sup>23</sup>, after surveying experience with ICTs in a cross-section of developing and least developed countries (LDCs), concludes:

"Radio is a powerful, sustainable technology for meeting many of the information needs of the poor. A policy that promotes access to as wide a range of radio (and television) broadcast options as possible is clearly important for the development of opportunities for the poor ...

Looking at telephones, because of the historical concentration of access amongst wealthy urban populations, we have seen that telephone rollout has traditionally been a force for divergence in incomes both between rich and poor countries and within poor countries. However, technological change, policy reform and innovative universal access programs such as that in Chile has made the goal of extending telephone access to the majority of the poor an increasingly feasible idea.

It is clear that the first step in extending telephone access to the poorest remains a program of reform towards well regulated private, competitive markets, which have repeatedly delivered expanded network access at lower cost.... To extend access beyond the market, subsidy auctions to provide lowest cost, privately provided public access in unserved areas (the model used to reach universal access in Chile) have proved affordable and sustainable... Hopefully, this will turn telecommunications rollout from a force for divergence to a force for convergence.

It will be a while before the same can be said of the Internet. Again, this does not mean that the technology is irrelevant to LDCs. It will have a range of uses in production, trade and the provision of government services that should increase incomes and improve the quality of life of the poorest. Through intermediary technologies including radio and telephony, the Internet might also have a significant impact on information flows directly to and from the poorest. However, at least until technological advance has made Internet access less expensive and more straightforward for the illiterate and minority language speaker to use and education has become increasingly widespread, the use of traditional computers hooked up to the Internet as a tool for poverty alleviation should probably not involve programs for universal access.

Even the cost of universal access to simple telephony would be a large burden on government and aid budgets. If we assume that service can be provided to the great bulk of the poor who currently lack access at the same cost as in Chile (\$10 per head), this cost is equal to half of annual per capita spending on health in low income countries. Adding the Internet to

<sup>23</sup> Charles Kenny, in *The Costs and Benefits of ICTs for Direct Poverty Alleviation*, draft, 33 pages, January 2002.



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universal access goals would greatly increase that cost. As we have seen, such programs are likely to be complex and very expensive, quite possibly for limited benefit. Instead, the Internet should be used as an indirect supporting tool in efforts to improve information and communications flows that benefit poor people.”

## European Commission

An EC review of the ICT components of EU assisted development ICT projects in South and South-East Asia<sup>24</sup> covers 31 projects. Three of these were in Nepal:

- Kathmandu Valley mapping programme
- Bagmati integrated watershed management programme
- Strengthening veterinary services for livestock disease control

Five of the 31 projects, including the third of these Nepalese projects, were selected for in-depth evaluation.

The great majority of the ICT components in all 31 projects were for project management use – that is, they fell into the “indirect application” category. The ICT components were felt to be a very productive use of resources. For the five projects that were assessed in depth, the percentage of total project resources devoted to ICTs was relatively low (generally 1% to 10%) but their contribution to results, though usually hard to quantify, was much higher than this.

Relevant lessons learned from the exercise include:

- Project sustainability requires very close co-operation with the beneficiary, skills transfer to local personnel and continuing access to all the required technologies.
- ICT systems should be clearly targeted and kept as simple as possible while achieving their goals.
- The Internet and e-mail offer huge benefits to efficient project implementation. If equipment and systems are handed over, they form a valuable output as well as input.
- A working telecoms infrastructure is very important for links between central offices and field operations.

A further lesson derived specifically from the Nepalese veterinary services project was the importance of making available media and communications expertise, to ensure proper publicity for project achievements. Without such expertise, full value cannot be derived from the ICT budgets for publicity.

<sup>24</sup> *Information Society and Development: Review, Asia Final Report*, by Paul R Watson, 2000, 194 pages



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## Asian Development Bank<sup>25</sup>

Asian Development Bank's strategy for ICT in development has three main thrusts:

- Create an enabling environment by fostering (i) the development of innovative sector policies, (ii) the strengthening of public institutions; and (iii) the development of ICT facilities and related infrastructure, and networks
- Build human resources to improve knowledge and skills, and to promote ICT literacy and lifelong learning of citizens through E-learning and awareness programs
- Develop ICT applications and information content for Asian Development Bank-supported projects/activities, e.g., poverty reduction and good governance.

Most relevantly for Nepal, the strategy report comments:

"The benefits of E-government and Internet for the poor who live in isolated and remote areas without access to electricity, telephone, Internet, or ICT facilities could be questioned. Nevertheless, for villages without those basic facilities, appropriate technologies are available, e.g., solar energy for electricity, and satellite linkups for multimedia data access. Clustering villages around strategic Internet/networks access points can provide a cost-effective way to provide connectivity and access at affordable cost. Community linkages to government-run educational and information sites will be useful to provide access to information on public sector operations e.g., job opportunities, business expertise, microcredit."

## UK Department for International Development<sup>26</sup>

This report is built on a wide-ranging review of relevant literature, and contains an 8-page bibliography. It analyses how ICTs can contribute to the achievement of the Millennium Development Goals. Again, most of the ICT applications identified are indirect ones.

The report's key messages for developing countries (who themselves have the most important role in realising the potential of ICTs) are:

- An appropriate enabling environment for information and communication technologies, including effective regulatory mechanisms, is essential.
- It is equally important that developing country governments implement policies that foster private sector investment and innovation more broadly.

<sup>25</sup> *Towards e-development in Asia and the Pacific: A strategic approach for information and communication technology*, Asian Development Bank, June 2001, 25 pages; also relevant is *Digital Divide: Determinants and Policies with special reference to Asia*, ERD Working Paper no 27, October 2002, 30 pages

<sup>26</sup> *The significance of information and communication technologies for reducing poverty*, DFID, January 2002, 67 pages



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- A third important element of the enabling environment is implementing policies to allow for the free flow of information, and permit and encourage diversity in broadcast and print media.
- Promoting ICT access for the poor, and especially those in rural and remote areas, requires efforts by governments, the private sector and other partners.

## Inter-American Development Bank

A 2001 report<sup>27</sup> on telecentres in Latin America and the Caribbean provides a valuable overview of a wide range of experience throughout the world. It includes an 11-page global reading list and a 6-page summary of recommendations. Points emerging that may be relevant to Nepal include:

- A survey in Peru of users of "cabinas" (public Internet access points) showed that some cabina users are poor, but they were relatively well-educated (often, students). Therefore, the cabinas were felt to have little impact on poverty.
- In all countries studied, Internet users are primarily young, and as with young users elsewhere their main uses are chat and e-mail.
- Local management and community involvement are important to the success of telecentres. State start-up funding is welcomed, but later state involvement is discouraged.
- Vouchers to help poor users, or especially low charges for particular categories of users, are preferable to charging below-cost prices to everybody. (For example, in Panama the normal price of an hour's Internet use is US\$1.50, but schoolchildren are charged only \$0.25 for their first hour and \$0.50 for their second hour).

## Other relevant reports

*Telemedicine and developing countries*, International Telecommunications Union Telecommunications Development Bureau Document 2/155, September 1997, 243 pages – a detailed analysis, including accounts of experiences in 20 countries.

*Promotion of Infrastructure and Use of the Internet in Developing Countries*, International Telecommunications Union Telecommunications Development Bureau Document 1/185, October 2001, 13 pages – high-level recommendations on sector regulation, together with a summary of relevant technologies.

*Lessons from InfoDev Education Projects, infoDev 2000* – a review of 8 completed projects in the education sector.

<sup>27</sup> *Telecentres for Socio-Economic and Rural Development in Latin America and the Caribbean, investment opportunities and design recommendations, with special reference to Central America*, IADB 2001, 141 pages



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*Internet Infrastructure and E-governance in Pacific Island Countries – a survey on the development and use of the Internet*, UNESCO, March 2002, 118 pages – detailed review based on findings in 15 Pacific developing countries.

*A rural ICT toolkit for Africa*, Intelcon for African Connection, February 2003, 68 pages – detailed “how to” advice on setting up rural ICT projects.

*Rural development with ICTs in Nepal: integrating national policy with grassroots resourcefulness*, Roger Harris and others, Electronic Journal on Information Systems in Developing Countries 2003, 12, 4 (12 pages) <http://www.ejisd.org> - report on early stages of pilot ICT projects in Belberi and Syangja (part of UNDP South Asia Poverty Alleviation programme), focusing on the notion of *infomobilisation*.

*Closing the gap in access to rural communication – Chile 1995-2002*, Bjorn Wellenius, November 2001, 63 pages – detailed analysis of Chile’s pioneering approach to providing rural telecommunications access, identifying success factors and including recommendations for improvement.

*Can information and communications technology applications contribute to poverty reduction? Lessons from rural India*, Simone Cecchini and Christopher Scott, April 2003, 22 pages – presents and analyses five rural Indian ICT projects, using a diffusion model.

*Community radio in India – background and perspectives*, VOICES for AMARC (Association Mondiale des Radiodiffuseurs Communautaires), February 2002, 63 pages.

The website *eGovernment for Development: Cases of eGovernment Success and Failure from Developing/Transitional Countries*, provided by the University of Manchester’s Institute for Development Policy and Management at <http://www.egov4dev.org/topic1cases.htm>, is a useful searchable resource for exploring experience of e-government projects.

Where URLs are not provided, or where they have changed, try the following resource sites, which also contain links to much more material. Alternatively, e-mail [cbm@antelope.org.uk](mailto:cbm@antelope.org.uk) to ask for a copy.

<http://www.developmentgateway.org/node/133831/>  
[http://www.itu.int/ws/is/documents/background.asp?lang=en&c\\_type=dt](http://www.itu.int/ws/is/documents/background.asp?lang=en&c_type=dt)  
<http://www.comminet.com/materials.html>  
[http://network.idrc.ca/ev.php?URL\\_ID=25549&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201&reload=1055243289](http://network.idrc.ca/ev.php?URL_ID=25549&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1055243289)



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### ANNEX 3 APDIP CASE STUDY PROJECTS

Project	Brief Description
1. Milk Collection Centres, Anand (Gujarat)	The Anand Milk Union limited (AMUL) with than 578,000 members was the first cooperative dairy to be established in Gujarat, in 1956, and it collects 0.8 million litres of milk from 1,003 milk societies every day. AMUL introduced an electronic automatic milk collection system in 691 milk collection centres, which reduce the time required for collecting the milk. The system weighs the milk and measures its fat content at the time of delivery to the centre, and this has enabled immediate payments to the farmer, thereby eliminating the previously opaque procedures that often left the farmer short-changed and with little recourse for query. The project has been selected for the study because the technology tool has affected a huge population of women dairy farmers socially as well as economically.
2. Gyandoot, Dhar (Madhya Pradesh)	This project started as a comprehensive community network in Dhar district with 44 ICT-equipped information kiosks. More than 24 public services were installed, including land records, agriculture commodity rates, grievance redressal, and applications to government departments. These were charged to users. All the kiosks are either community financed or privately owned. Wireless in Local Loop technology was used. This project has been operational since January 2000. It has been replicated in more than 35 districts in India.
3. Bhoomi Project, Bangalore (Karnataka)	The Department of Revenue, Government of Karnataka has computerized 20 million land ownership records of 6.7 million farmers in the state. Each record is available online from 177 taluka kiosks at a cost of Rs. 15 per record. The project has been widely acclaimed as possibly the most successful ICT project for land records in the country.
4. Warna Wired Village Project, Kolhapur (Maharashtra)	Seventy villages in Kolhapur and Sangli district of Maharashtra have been linked through a WAN using dial-up connectivity and VSAT technology. This project aims to provide benefits to the members of sugar cooperative and the villagers. More than 12 public services, such as measuring the content of carbohydrate in sugarcane, payments due to farmers, land records etc, have been introduced. This project was started in 1999 by Government Of India, Government of Maharashtra and Kolhapur sugar cooperative on a cost sharing basis in a proportion of 50:45:5.
5 Community Information Centers, (Sikkim)	This project was started by the Department of Information Technology, Government of India with technical support of the National Informatics Centre (NIC). This pilot started in thirty blocks of 7 North Eastern states in 2001. Presently, all 487 blocks in 79 districts of the NE states, including Sikkim, are provided with one telecentre each. The kiosks provide e-governance, e-health, e-education and e-business opportunities.



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6. Tarahaat.com, Jhansi (Uttar Pradesh)	The project was started by Development Alternatives (with the help of a dozen project partners) in four districts of North India as a business model to cater to the un-served rural markets. The project provides services like Tarabazaar (e-bazar), Taravan (mobile kiosks), Taraguru (e-education), Taradhaba (cyber café), Tarareporter (news), Taradak (e-mail), Taravendor (e-commerce) and Taracard (e-greetings). This project provides connectivity to franchisee kiosks through C-band satellite, VSAT or dial-up modem, according to the infrastructure available.
7. E-Chaupal, Ujjain (Madhya Pradesh)	This web-based initiative of Indian Tobacco Company's international Business Division in Central India caters to Soya growers for information, products and services required in Soya farming. The kiosks facilitate the supply of high quality farm inputs and purchases of Soya at the doorsteps of the villagers. This project was started in 42 villages of Ujjain district and around 1800 Kiosks in Madhya Pradesh and has around 3300 kiosks in Central India. The kiosks also handle dealerships of various commodities like Hero Honda and cycles, and Eicher tractors. This feature has added extra benefits to the villagers in terms of minimizing their cost on travel expense.
8. Tamil Nilam Touch Screen Project, Chennai (Tamil Nadu)	This project is an initiative by the Government of Tamil Nadu in all 206 talukas of the state. Kiosks at each of the taluka headquarter have touch screen monitors and with laser printers and they provide a range of public services such as land records, mutation and partition of land etc. The project has been operational since 2002.
9. India Agriland, Nellikuppam (Tamil Nadu)	In this project, EID Perry, a 212 year old private company, working in the field of sugar production caters to 100,000 sugar cane growers. The company has partnered with N-logue Communications Pvt Ltd. in 48 kiosks and has been in operation since 2003. The project disseminates market and commercial information to farmers and provides them with direct access to their markets. Information includes crushing details of sugar cane, payments due to farmers, local news, weather forecast, information cultivation and farming techniques, email etc. These services are provided at user charges ranging from Rs.5 to Rs.10 per service. Information kiosks also collect soil samples for testing and sale seeds, sugar, tea and candies.
10. FRIENDS, Thiruvananthapuram (Kerala)	(Fast, Reliable, Instant, Efficient, Network and Disbursement of Services). This one-stop service centre uses computers to provide public services such as payments of electricity bills, examination fees, motor vehicle tax, building tax, property tax, water bills, telephone bills etc. This project is operational in all the 15 district headquarters of the state. The services are provided on a user-charge basis and governmental officials operate the counters at the FRIEND centres. On an average day, 400-450 citizens visit the centre out of which 47% deposits electric dues, 43% water vehicle dues, 5% water taxes and 5% all other services.
11. Mahiti Shakti,	In this project, about 80 telecentres have been set up in Panchmahal



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Panchmahal (Gujarat)	district to cater to the information needs of villagers. The network provides more than 200 online forms of different government schemes. It also provides updated sanctions of development works from the District Rural Development Agency and the District Planning Board, along with some GIS functions. The information is available in local language (Gujarati), and the project has been operational since 2001.
12. Computer-aided Administration of Registration Department (CARD), Hyderabad (Andhra Pradesh)	In this project, 214 registration offices have been completely computerized since 1998. This project provides services such as encumbrance certificates, valuation certificates, market value search etc on user-charge bases. The time taken for registration of documents has been reduced from one day to 15 minutes. More than four million documents have been registered, 2.16 million encumbrance certificates, and 3.73 million registration check slips have been issued since 1999.
13. Janmitra, Jhalawar (Rajasthan)	This project is a joint initiative of UNDP and Government of India, operational since 2002. The project has been implemented with the help of district administration Jhalawar, Department of Information Technology (Government of Rajasthan) and RAJCOMP. A rural intranet provides e-governance, e-education, e-health and e-commerce services to the villagers through 30 Community Information Centres. 21 departments are connected to the server through dial-up connectivity and 13 departmental offices are on LAN with the server. The kiosks also function as stamp vendors, petition writers, computer education providers and DTP providers.
14. SEWA: Use of Satellite Communication for training, Ahmedabad (Gujarat)	The Self Employed Women's Association (SEWA) is a large primary trade union working since 1972 for informal sector women workers. SEWA's two main goals are full-employment and self-reliance. Since 1998 SEWA started using SatCom programme (Satellite Communication Programme) with its receiving terminals in 9 districts and transmitting terminal in Gandhinagar. SEWA has started computer training for the semi-literate women workers. Many of the SEWA milk cooperatives are using computerized milk collection software.
15. N-Logue Tele-centers Project, Madurai (Tamilnadu)	N-Logue Communication Pvt. Ltd., a commercial offshoot of Indian Institute of Technology, has pioneered Wireless in Local Loop Technology (WiLL). In Madurai district of Tamilnadu 30 telecentres have been operationalised, which provide a link between the doctors at Madurai Medical College and the villagers. Besides telemedicine, several other web-based services are also provided to the villagers.
16. Gramdoot, Jaipur (Rajasthan)	Aksh Optifibre Ltd is India's second largest manufactures of optic fibre cables. The company has provided an integrated hardware and software solution for connectivity in the Gramdoot project. Gramdoot provides e-governance through broadband services. 200 gram panchayats in Jaipur district are connected through broadband. The project also provides cable connections to rural households on which 32 television channels are telecasted. High-speed non-dial-up Internet



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	access at 70 kbps is available to 200 villages. Land records, prevailing market rates of agricultural commodities, hindi e-mail facilities, application for certificates, online grievance redressal are also provided.
17. Deccan Development Society Community Radio, Medhak (Andhra Pradesh)	The Deccan Development Society (DDS) is a twenty year-old grassroots organization working with women's Sanghams (village-level voluntary associations) in about 75 villages in Medak district in Andhra Pradesh. This project is an initiative by UNESCO and the objective is to create community's own media, which can focus on their issues and concerns and utilize their knowledge and wisdom. DDS has produced 350-hour audio programmes, pertaining to diverse issues like wasteland development, agriculture, gender issues, seed cultivation, food security, education, eco-development etc.
18. VISP, Tiruchirapally (Tamil Nadu)	Activists for Social Alternatives (ASA) has been working in five districts of Tamilnadu in rural micro financing since 1993. It has 2,000 women credit and thrift groups and has 60,000 women members. In May 2003 ASA launched Vidyal Information service provider (VISP) in 6 villages. The project provides services like prices of agriculture commodities, horoscopes, rural market place, matrimonial services, educational services, and grievance redressal, government forms etc. by using the software developed by Dhristee Foundation. The kiosks also provide services like web browsing, DTP, data entry job work, net-to-phone and basic computer education.
19. Akshaya Mallappuram (Kerala)	In 2001 in Mallappuram district of Kerala a joint project between local bodies (gram panchayats) in rural areas and municipalities in urban areas and private entrepreneurs known as Akshaya was started to bridge the digital divide by providing community access to computers and the Internet. 565 community technology centers (CTC's) have been implemented in the district. Akshaya operates public-private partnerships in establishing the community technology centre in remote villages.



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