

Final Report

ICT Report

**SPECIALISED POLICY ADVICE
(PS-2)**

for

His Majesty's Government

**Ministry of
Information and Communication**

Nepal

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Teleplanning A. Wirzenius Ltd.
arnow@iki.fi, www.iki.fi/arnow/

in co-operation with

Bird & Bird
www.twobirds.com

Antelope Consulting
www.antelope.org.uk

Information and Communication Technologies in rural Nepal –
enhancing access and service delivery

STRUCTURE OF REPORT

The report of project Specialised Policy Advice (PS - 2) consists of four volumes:

❖ **Main Report**

- Annex Draft National Telecommunications Policy
- Annex Explanatory Document to Policy

❖ **ICT Report, Information and Communications Technologies in Rural Nepal - enhancing access and services delivery.**

The main author of this volume is Ms. Claire Milne, Antelope Consulting, cbm@antelope.org.uk, www.antelope.org.uk.

❖ **Legal Report**

- Legal assessment of the current regulatory regime
- Draft short term amendments to legislation

The main author of this volume is Mr. Simon Topping, simon.topping@twobirds.com, www.twobirds.com.

❖ **Annexes Report**

- Annexes (working papers on selected topics, to be used in implementation of the Policy)

The report is structured provide shorter reports for those whose interest is only part of the scope of the entire project.

The Main Report includes the high level outcome of the Project, including the draft National Telecommunications Policy. The Policy includes implementation strategies and an annex with timing of actions. The Explanatory Document includes the background for the Policy.

The Information and Communications Technologies (ICT) volume is the outcome of two separate tasks in the TOR, addressing introduction and use of ICTs in rural Nepal. Implementation of the ICT proposals is less clear-cut than for the policy proposals, and requires further study.

The Legal report includes a legal assessment of the proposed amendments to the legislation, Act and regulation.

The Annexes Report includes a collection of separate discussion documents that were developed during the work in co-operation with the Policy Team. The purpose of the working papers was to work out various key policy topics with the Policy Team and in general the MOIC and the NTA. The working papers are essential for implementation of detailed strategies, to be used by MOIC and NTA staff and subsequent consultants.

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ABBREVIATIONS

ADB	Asian Development Bank
ADSL	Asymmetric Digital Subscriber Line
ARPU	Average Revenue per User
BOI	Board of Investment
BTO	Build Transfer Operate
CBO	Community Based Organisation
CDMA	Code Division Multiple Access, mobile technology
DFID	Department for International Development (United Kingdom)
DIDC	District Information and Documentation Centre
GATS	General Agreement on Trade in Services
GDP	Gross Domestic Product
GIS	Geographic Information System
GNP	Gross National Product
GSM	Global System for Mobile Communication, mobile technology & service concept
HMG	His Majesty's Government of Nepal
IDA	International Development Association
ICT	Information and Communication Technologies
ICIMOD	International Centre for Integrated Mountain Development
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunication Union
LDC	Least Developed Country
LGP	Local Governance Programme
LOI	Letter of Intent
MBO	Management Buy-Out
MCT	Multipurpose Community Telecentre
MOF	Ministry of Finance
MOIC	Ministry of Information and Communication
MOLD	Ministry of Local Development
MOST	Ministry of Science and Technology
MSI	Media Services International
NGO	Non-Government Organisation
NITC	National Information Technology Centre
NTA	Nepal Telecommunications Authority
NTC	Nepal Telecommunications Corporation
OCID	Overall Composite Index of Development for Districts
OECD	Organisation for Economic Co-operation and Development
PABX	Private Automatic Branch Exchange
PDDP	Participatory District Development Programme
RIO	Reference Interconnection Offer
RoW	Rights of Way
RUPP	Rural-Urban Partnership Programme
SAPAP	South Asia Poverty Alleviation Programme
SIM	Subscriber Identity Module
SLT	Sri Lanka Telecom

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SMS	Short Message Service, text messages in mobile telephony
TOR	Terms of Reference
TSRP	Telecommunications Sector Reform Programme
UMTS	Universal Mobile Telecommunications System
UNDP	United Nations Development Programme
UPS	Uninterrupted Power Supply
USD, US\$	Dollar of the United States of America
UTL	United Telecom Ltd.
VAT	Value Added Tax
VCR	Video Cassette Recorder
VDC	Village Development Committee
VSAT	Very Small Aperture Terminal (satellite terminal)
WLL	Wireless Local Loop
WTO	World Trade Organisation
xDSL	Digital Subscriber Line of any technology

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KEY TERMS

Broadband	Data transmission at a speed about sufficient to transmit slow video, usually implemented using the fixed telephone network (ADSL), cable television networks, or wireless connections to users
Commercialisation	Conversion of a government owned entity towards more commercial ways to operate, usually more customer oriented
Corporate services	Generic name for telecom services that companies, corporations and government entities etc. use, such as data transmission, other data services, leased lines, virtual networks, video transmission, etc.
Dual band spectrum	Radio spectrum from two different bands assigned to mobile operator, e.g. GSM 900 and GSM 1800
Dual licensing regime	Licensing regime with two parallel types of licences, such as new and old, during a transitional period
Individual Licence	A licence that is issued based upon a tender for spectrum based telecommunications services from year 2004 onwards
Interconnection	Connection of telecommunications networks to carry calls etc. from one network to another, including technical, financial, administrative and other required arrangements
Least subsidy tendering	Tendering for arranging defined services in a defined area, which is not served on a commercial basis, based on the lowest (usually one time) subsidy that an applicant offers
Liberalisation	Allowing more operators in the market, often transition from monopoly to competition
Licensing	The process of issuing licences and authorisations
Open and Technology Neutral Licensing, or Open Licensing	The procedure of issuing Standard Licences and Individual Licences
Ownership Tax	A tax (Rs 1500) levied on every new telephone user
Price elasticity	Relation between price and demand, lower prices <-> higher demand
Privatisation	The procedure when ownership of a government owned entity is sold to the private sector, either partly or fully

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Receiving Party Pays	The principle that the receiver of a (mobile) telephone call pays for receiving the call
Rights of Way, Right to Use Land	The rights of an operator to locate network components on public ground (streets, roads, etc.), based on telecoms legislation
Royalty	A tax (4 %, or fixed in a licence as an outcome of a tender) imposed on telecommunications user bills in addition to operator charges, but before imposing VAT
Service Charge	A tax (15 %) imposed on telecommunications user bills in addition to operator charges, but before imposing VAT
Standard Licence	Term used in this project for a licence that is issued to any applicant meeting minimum criteria, for operation of telecommunications services from year 2004 onwards
Technology Neutral	The principle that licences, taxes, rules and regulations etc. are the same independent of technology, also that operators may use any technology
Telephone penetration	Average number of telephone connections per 100 inhabitants. The ITU uses the term <i>teledensity</i>
Universal Access	All inhabitants in a country have access to a public telephone (relevant for developing countries)
Universal Service	All inhabitants in a country have the right to obtain a telephone to his / her home at an affordable price (not realistic in developing countries)

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EXECUTIVE SUMMARY

Characteristics of Information and Communication Technologies

We consider the full range of these technologies. The most important types of end-user device are shown in the figure below, along with some of their basic characteristics.

Terminal device	Cost	Operating modes			Content types		
		Stand-alone	One-way	Two-way	Speech	Pictures	Text
Paper	very low	yes	yes	yes	no	yes	yes
Radio set	low	no	yes	no	yes	no	no
Television set	mid	with VCR	yes	no	yes	yes	yes
Telephone	mid	no	yes	yes	yes	no	no
Computer	high	yes	yes	yes	yes	yes	yes

We note that different ICTs have very different characteristics and that it is important to choose the right ICT for each application.

Services to be delivered

By “service delivery” we mean reaching users of any service for which Government has responsibility, though the work may be shared with NGOs and the private sector. “Delivery” is not a one-way process – it includes feedback from and often dialogue with users. Important examples are shown in the figure below, along with whether communications are needed with end-users (direct applications) or just the staff who are involved (indirect applications).

Application	Indirect target audience	Direct target audience
Education	Teachers	Students
Health (prevention)	Extension workers	Everyone often
Agricultural advice	Extension workers	Farmers
Income generation (advice, commerce)	Extension workers	Small business people
Postal service	Postmasters	Everyone sometimes
Official certificates etc	Local officials	Adults occasionally
Infrastructure (roads, water, electricity)	Local officials	None
Planning	Local officials	Many people sometimes

We see that all the services considered require communications with the staff involved in their provision, but their direct target audiences vary considerably. The importance of each service to members of the target audience also varies, as does the frequency with which the services are used. Given limited resources, all these factors must be taken into account in planning introduction of new ICTs.

Choice of Information and Communication Technologies

Compared with end-users, the staff involved in service provision are relatively few and relatively well-educated. They can therefore benefit more easily from Internet and e-mail.

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Improved ICTs for these staff will lead to improved service provision and will ultimately benefit end-users.

In the context of Nepal, vital points to take into account in choosing the right ICTs for rural end-users to use directly include:

- Actual availability. Nearly half of rural Nepalese households already have a radio set, while less than 1% have a telephone.
- Low cost, together with suitability for shared use, which further reduces cost.
- Usability by people with little or no education. Internet requires a high level of literacy, which is probably possessed by fewer than 5% of Nepal's population.
- The target audience for the specific application, the importance of the application to them and the frequency with which they use it

All these considerations point to the broadcast ICTs (radio and television) being more suitable than Internet in the short and medium term for reaching most rural people directly for most applications.

Lessons from international experience

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.

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 ICTs, people who benefit the most tend to be younger and better educated.

Conclusions relating specifically to rural telecentres include:

- Sustainability of rural multipurpose telecentres presents a major challenge. Telephony is well used, but often there is little demand for more advanced services, especially if they are priced at a commercially realistic level. The location of rural telecentres is

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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.

Current developments in Nepal

The Figure below illustrates some major current and planned uses of electronic ICTs for rural service delivery that we have become aware of. It is not comprehensive.

Education	Computers provided to 100-150 secondary schools. Primary teacher training uses daily radio broadcasts. Plans for Open University within 3 years using broadcasts.
Health	Regular radio broadcasts. Healthnet online database for professionals.
Agricultural advice	Regular radio broadcasts. Online access to market prices.
Postal service	Plans for e-post between 18 Post Offices in 5 years.
Official certificates etc	Mainstay of “e-governance” pilot projects – telecentres being installed in 9 municipalities and 8 rural market centres, plan to extend to 33. Land records computerised in one District.
Planning, general	Computers now in all District Headquarters for general development, health, education; some are linked to Internet. Geographic Information Systems producing detailed maps using bottom-up data in Kathmandu and several Districts. Successful community radio stations in a few places. Satellite radios working in 38 VDCs. Rural telecentre pilot project – 2 out of initial 15 are (near) operational, plan for 1500 to follow.

We observe that there is quite a lot of relevant activity, but little co-ordination and no overall planning for provision of electronic ICTs for rural service delivery. Facilities provided do not necessarily match priority needs.

Key findings

Given Nepal’s difficult terrain, electronic ICTs have a very important contribution to make to its economic development. But they need to be introduced with specific applications in mind and as part of properly managed projects, not as ends in themselves.

It is important to choose carefully the best ICT for any given application from the wide choice available. Indirect applications of ICTs may often be a cost-effective way of improving rural service delivery.

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The postal service is the only two-way communications service available to the vast majority of rural people. It is especially important given the large number of migrant workers and their need for money transmission. However, postal services are generally slow, inefficient and running at a large loss.

Despite having many shared objectives, the various current projects have little mutual contact. Co-ordination and co-operation will be highly beneficial. The lessons available from pilot projects must be shared before larger commitments are made.

Conditions vary widely among different Districts. Bottom-up participatory planning will be essential to ensure that the ICTs provided suit local conditions. Top-down planning by outsiders without local consultation may well lead to expensive mistakes.

Although our focus is rural development, locating early telecentres in towns may be a good way to reach rural people. Rural market centres are particularly promising locations because many rural people visit them regularly.

The lack of power infrastructure is a major obstacle to providing rural ICTs. Solar power may be used, but it greatly increases the cost of any installation.

The take-up of computers and the Internet by Departments of central Government is very patchy. General use of these tools by central Government is a prerequisite for their effective use in rural service delivery (whether indirect or direct). It is also a major step towards more open governance.

Main proposals

The proposed overall policy objective is:

To make available all appropriate Information and Communication Technologies (ICTs) in support of rural development and poverty alleviation, drawing on the full range of options - including, for example, radio, television, video cassette recorders, and stand-alone computers as well as fixed and mobile phones and Internet.

In support of this objective, two points of national policy are proposed:

Ensure that appropriate ICTs are available in rural areas to meet end-user needs, which means at first mainly radio, television and telephones, as these do not require special training or literacy for people to use them.

Foster the full use of appropriate ICTs by workers in both government and NGO rural development and infrastructure projects, which means spreading in particular Internet availability and human capability to use it as fast as practicable down to District level and beyond.

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Specific actions are proposed in support of each of these main points, together with some which support both. We assume that the proposals in the main part of the PS-2 project are implemented, which means that over half the population will be within mobile phone coverage by 2006, and a few hundreds of public Internet access points will have been provided in conjunction with mobile base stations.

We expect that the proposed approach will lead in the next five years to a situation in which:

- Almost everybody in Nepal can listen to the radio, watch television and make and receive phonecalls (or text messages) on a daily basis.
- Most people who are sufficiently educated to use computers and the Internet themselves will be able to do so by travelling to a town for which they have other reasons to visit (say, on a weekly basis).
- All District Headquarter towns, and in more advanced Districts several towns, will have multipurpose community telecentres where qualified staff will help anyone who needs help to use a computer or the Internet.
- All agencies of government with responsibilities for service delivery to rural areas will be in a position to take advantage of these new access possibilities. They will use the networks to communicate with their own staff and with the public. They will be producing appropriate content to support service delivery, mainly for broadcasting but also, increasingly, for computer and Internet distribution.

Proposed actions: ICTs for rural end-users

Enable local communities to assess the full range of ICTs available to them (for example, by training officials and providing illustrative materials for Community Organisations). Encourage all Districts to include an informed assessment of ICT requirements in their development plans. Support the fulfilment of these plans by providing facilities, equipment, training and personnel where needed to complement those that become available commercially. Supply external matched funding in more favourable ratios to projects that cater for disadvantaged groups.

Include planning for publicly accessible phone and Internet service in Rural Market Centre development plans. An achievable target may be to reach 150 rural market centres by 2005.

By the end of 2007, ensure virtually universal access to national radio and television broadcasts (using satellite transmission where terrestrial coverage is uneconomic, and providing publicly accessible television sets and radio receivers in all VDCs). Give high priority to producing programmes which will inform people on development issues while remaining attractive. Foster the development of local and community radio and television stations, which will carry these national programmes as well as locally-produced material.

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Provide training for telecentre staff (including “Internet scribe” skills where needed). They and others will be supported to carry out community awareness campaigns, designed to help rural people to understand and make the most of the facilities that are being provided locally.

Remove any obstacles to private enterprise providing publicly accessible ICT facilities on a commercial basis. Consider positive incentives, such as loans to enable under-employed youths to buy computers.

Plan to provide e-post and secure electronic funds transmission at all Post Offices in places where power supply and telephone connections are available, and where premises are suitable. Following a pilot project to identify and resolve practical problems, all Post Offices that already satisfy these criteria should provide these services by 2005. After that, other Post Offices should be connected progressively to the e-post network when power supply and telephone connections arrive nearby. In some cases, e-post may justify special provision of these services to remote areas.

Proposed actions: ICTs for rural development professionals

Under a single Ministry with overall responsibility for information and communications infrastructure, build the strength and capabilities of the National Information Technology Centre (NITC), to enable it to become the focal point for co-ordination, planning and support for all development projects using ICTs. It will ensure co-ordination with the rural electrification programme and with the rollout of fixed and mobile telephone networks. It will encourage outside investment in ICT projects by assisting choices of ICTs that are appropriate to local conditions, and facilitating sharing of what is provided among different Government Departments and different projects. An essential tool for this will be an up-to-date, publicly available database of all such projects. NITC will also run a library of appropriate content, which can be made available in different formats as required (e.g. on CD-ROM as well as over the Internet, enabling stand-alone computers to use the material).

Proposed actions: all ICT applications

Connect all Departments of central Government to the Internet. By the end of 2004, all Departments will provide informative websites including all important published documents. By the end of year 2005, in those Departments with responsibilities for service delivery to end-users (e.g. Agriculture, Health, Education, Post), all staff whose jobs require completion of secondary education (or above) will be Internet- and e-mail-literate and will use e-mail for internal and external communications. This is necessary both to provide open Government, and to facilitate the use of Internet and e-mail by rural development projects.

Set up local ICT co-ordinating committees in Districts, including representatives of the VDCs, the various Government offices, NGOs active in the area, private entrepreneurs and any other interested parties. These committees will be responsible for liaison both within the District and with central Government, with the aim of ensuring both appropriate local ICT provision and the fullest possible exploitation of what is provided.

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1. INTRODUCTION

1.1 Status of this paper

The main thrust of the PS-2 assignment is telecom policy in support of greatly improved telecoms access throughout Nepal, especially in rural areas.

This sub-project looks at:

- Ways to enhance access to the Internet and other information and communication technologies in rural areas.
- How information and communication technologies can be used to improve delivery of health, distance education and other government programmes and services to the rural population. Here we understand “delivery” not in a traditional one-way sense, but to include feedback from and participation by the local people.
- As part of a telecoms policy project, our focus is on communications networking aspects. We touch to a lesser extent on content issues and stand-alone IT applications.
- The approach to this sub-project was:
- During a visit to Nepal in May 2003, a number of interviews with key people took place, in order to find out as much as possible about existing relevant activities in Nepal, and also to get interviewees’ views. At this stage a preliminary paper was provided as an annex to the Outlines Report to the Ministry of Information and Communications.
- Using desk research, further information was gathered both on Nepal and on relevant experience from other countries.
- A discussion paper built on the preliminary paper by including the findings of the desk research was circulated for comment both inside and outside Nepal.
- A return visit to Nepal took place in September 2003. Further interviews and an informal workshop were held, and a presentation was made to the project final workshop. This draft final report aims to take account of all input and comments received.

The main part of PS-2 builds on much earlier work and has led to implementable recommendations. The topic of this sub-project has been less fully developed, and has led to proposals, rather than to final recommendations. As the commissioning body for the project, the Ministry of Information and Communications has the lead responsibility for taking forward these proposals. Many other Ministries and organisations also have important parts to play in elaborating and implementing the proposals. This report is designed to be widely circulated to stimulate discussion and action.

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Thanks are due to many people who have generously supplied information and views, and especially to Mr. Gajendra Singh Bohra whose earlier work¹ laid the foundation for this sub-project, and who identified most of the interviewees. Discussions with Mr. Bohra and with the project director Mr. Arno Wirzenius have also been of great value.

1.2 Meaning of "ICTs"

The term "information and communication technology" (ICT) is a very broad one. The most recent ICTs, such as computers and the Internet, use advanced electronics. Often, the term ICT is used as if electronics were an essential part of them. But this is not true. More traditional technologies such as writing or printing on paper (post, books, newspapers, posters) remain necessary and valid ICTs; so do simpler oral communication methods like audio towers.

Of course, broadcast media (radio and television) are also electronic ICTs. Their messages reach many people at the same time, while telephony enables one-to-one communication. The World Bank's new Strategy for ICT² recognises the need for greater attention to postal services and mass communications media as a key part of one of its four new strategic directions.

This paper focuses on electronic ICTs, while recognising the continuing and complementary importance of traditional technologies. In Section 5 we will consider in more depth the different characteristics of different electronic ICTs and their relevance to rural Nepal.

1.3 Skill required to use the Internet

An advantage of all speech ICTs (e.g. telephony, broadcasting, tape recorders, voicemail) is that they require little or no special training to use. Almost anybody, however poor (so long as they do not have a disability), can speak and understand speech. To use written ICTs successfully, however, require people to have some level of literacy, generally above the minimum (level 1 below). An Organisation for Economic Co-operation and Development (OECD) report³ classifies literacy levels as follows:

Level 1: This is the usual definition for "literate", but the individual may be unable to determine the correct dose of medicine for a child from the information printed on the package.

Level 2: Can deal with simple written material only.

Level 3: Roughly the skill level for secondary school completion and college entry. This is the minimum for coping with life in a complex, advanced society, and for using the Internet successfully.

¹ *Action plan/programme for using ICTs at rural areas for poverty reduction*, G S Bohra, unpublished reports to National Planning Commission and Ministry of Science and Technology, 2002.

² *Information and Communication Technologies – A World Bank Strategy*, Washington DC, April 2002

³ *Literacy in the Information Age*, OECD and Statistics Canada, 2000

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Levels 4 and 5: Higher-order information processing skills.

Level 1 literacy may be adequate for sending and receiving simple letters. But to get value from the Internet requires at least Level 3 literacy. Reading and writing are not enough – being able to connect ideas and to assess information critically are also important. The OECD report showed that even in rich countries only 30% to 70% of the adult population are equipped to use the Internet. The figure in Nepal is probably well under 5%, and even less than this in rural areas.

In societies where many people are illiterate, the idea of the scribe is familiar. The scribe writes and reads on behalf of another person, and so enables him to benefit from (for example) sending and receiving letters. Postmen in Nepal sometimes act as scribes. The new term "*Internet scribe*" is now being used to describe the job of making the Internet useful to people without the skills to benefit from it directly. Telecentre staff may do this job.

In section 5 we explore in more depth which technologies are appropriate for rural Nepal.

1.4 Direct and indirect applications

ICTs can help rural populations in two main ways. Both are valuable:

- Indirectly, through improved services for the development workers (both field and office-based staff) who help to deliver services to rural populations. The health information database HealthNet is an example in Nepal. The development workers are generally well-educated people, who can learn to benefit from the new systems with little extra training. Often, they also either live in or visit towns, so can use existing telecoms systems which do reach the towns.
- Directly, by reaching the rural people themselves. Community radio such as the station in Madan Pokhara is an example. Simple, cheap technologies such as radio are also appropriate as "Internet extensions" to reach rural people quickly.

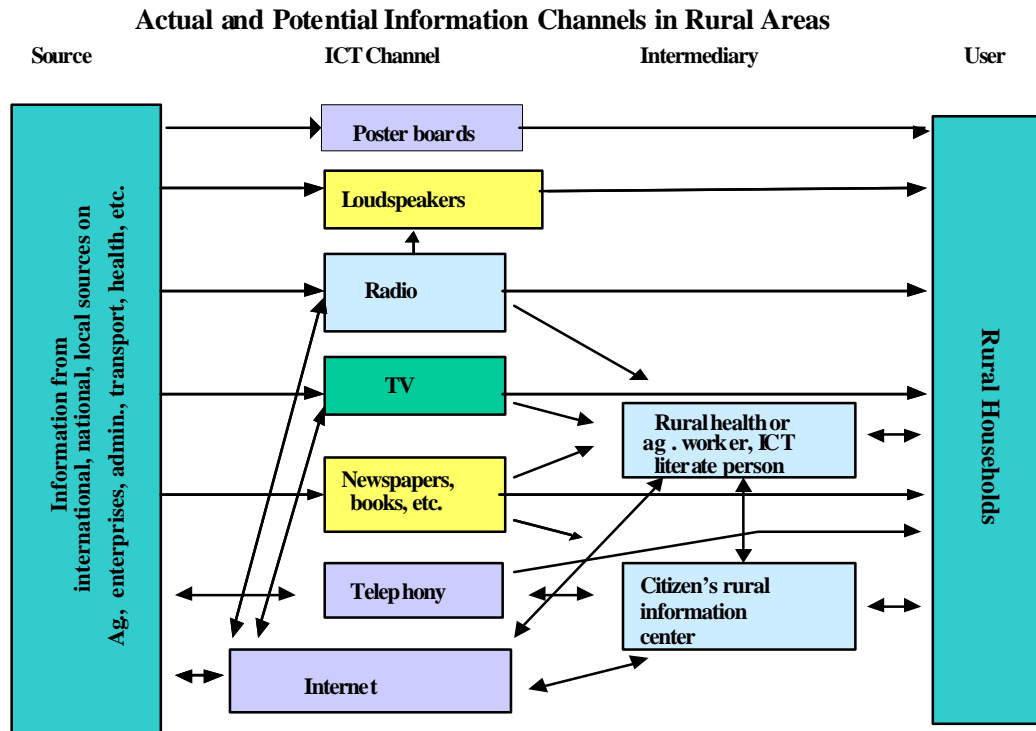
Application	Indirect target audience	Direct target audience
Education	Teachers	Students
Health (prevention)	Extension workers	Everyone often
Agricultural advice	Extension workers	Farmers
Income generation (advice, commerce)	Extension workers	Small business people
Postal service	Postmasters	Everyone sometimes
Official certificates etc	Local officials	Adults occasionally
Infrastructure (roads, water, electricity)	Local officials	None
Planning	Local officials	Many people sometimes

Figure 1 Direct and indirect target audiences for key applications

Figure 1 illustrates how direct and indirect target audiences and contact frequency vary greatly depending on application.

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Figure 2 illustrates how different ICTs can be useful to rural households - some can be used by the people themselves, even if they have little education, while others require intermediaries or helpers.



Source: The World Bank (not published).

Figure 2 Usability of ICTs by rural households

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2. NEPALESE SITUATION

2.1 Some basic facts about Nepal

Key features of Nepal which are relevant to decisions about ICTs include the points below. Some relevant statistics are summarised in Figure 3.

- Overall, the country is extremely poor. Nepal's annual per capita Gross National Product is around \$250⁴, and it qualifies as a Least Developed Country. Even in the best-off decile of rural households, 53% of consumption is for food, and this proportion rises to 69% in the worst-off decile. The median yearly rural per capita income available for all non-food consumption is around 2,500 NR (US\$33 at the current exchange rate of 75 NR to US\$1)⁵. Evidently, most people can only spend very small amounts each year – measured in rupees or cents rather than in dollars - on information and communications. The annex on Universal Access discusses budgets in more detail.
- Including Kathmandu, 58 towns and cities are classified as Municipalities. Their combined population is only 14% of the national total⁶. This project is mainly concerned with the rural population, which we take to be the 86% living outside the Municipalities, plus those (unknown but probably quite substantial in number) living within Municipality boundaries but in rural conditions.
- The country is divided into 75 Districts for local government, and each District into a number of VDCs (Village Development Committees). In all there are 3,915 VDCs. The population of a VDC averages 5,089, and its area 37 sq. kms. For electoral purposes each VDC is subdivided into 9 Wards, each of which consists of a number of settlements, often a population of a few hundred or less. The last census when settlements were counted was 1961, when they numbered 28,642 (including 16 municipalities)⁷, that is, on average around 7 settlements per VDC or 380 per District.
- The settlement is the actual unit in which people live (what is normally meant by the English word "village"), but facilities like schools and post offices are generally provided at the VDC level. This means that the average journey to visit these facilities is several kilometres. When undertaken on foot, which is the only option for most people, this translates into return journeys often of two to four hours.
- 46% of Nepal's rural population live in the relatively flat and densely populated Terai area, where there are some roads and motorised transport. Another 46% live in the hills, with very limited roads; and the rest, mainly in extreme isolation, in the mountains.

⁴ This and other statistics in this section are from *Statistical Pocket Book, Nepal, 2002*, Central Bureau of Statistics

⁵ Report on the Household Consumption Survey of Rural Nepal, 2000/2001, Central Bureau of Statistics

⁶ 2001 Census figures, Central Bureau of Statistics.

⁷ Quoted in *The Nature of Underdevelopment and Regional Structure of Nepal*, Baburam Bhattarai, Delhi 2003.

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- Interwoven with this geographical variety, Nepal has a huge mixture of different ethnic groups, with varying languages, religions and caste distinctions. Not surprisingly, the development level of the Districts also varies widely. For example, per capita food production varies from around 1000 calories a day in a "bad" District to over 5000 calories a day in a "good" one. Similarly, the overall literacy rate is 70% in Kathmandu but under 25% in much of the remote Karnali zone⁸.
- Many Nepalese from rural areas work abroad to supplement the low family income. Most go to India, for very low pay; others to the Middle East, Far East and elsewhere. It is estimated that 25% of households receive remittances.
- Political and governance problems underlie an unsatisfactory security situation. Resolving these will immeasurably help economic and social development.
- Rural electrification is proceeding slowly. The target for the 10th Plan is to provide electricity supply to 55% of the population by 2007⁹.

The Geographic Information Systems centre at NPC/PDDP has generously supplied maps which illustrate the distribution of population and communications in three sample Districts – Kanchanpur in the Terai, Kaski in the Hills and Manang in the Mountains. These are appended as Annex D.

⁸ Districts of Nepal – Indicators of Development, ICIMOD 1997. See also article *Poverty Mapping in Nepal - District Statistics and Policy Options*, Syed Zahir Sadeque, ICIMOD Paper Presented in the International Workshop on Poverty Mapping UNEP/GRID Arendal, Norway, October 14-16, 1998, online at <http://www.panasia.org.sg/nepalnet/socio/povertymap.htm>

⁹ *The Tenth Plan (Poverty Reduction Strategy Paper) 2002-2007*, Summary, National Planning Commission, May 2003. Available online at <http://www.npc.gov.np>.

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	Number	Source ¹⁰ , remarks
Towns		
Municipalities	58	Over 10,000 population
Districts	75	
Rural market towns for fast-track development	~200	Information from Central Department of Geography (CDG)
All rural market towns	~1,500	Information from CDG
Villages		
Village Development Committees (VDCs)	3,915	
VDCs reached by Village Development Programme	650	20,000 Community Organisations, 60 Districts (information from LGP)
Secondary schools	4,350	
Post Offices	4,009	
Sub-health posts	3,161	
Settlements		
Lower secondary schools	7,289	
Primary schools	25,927	
Settlements	28,462	1961 figure
Households	4,174,374	
Rural communications		
Districts with local Internet service	13	
Towns with cable television service	140	
VDCs with electricity, 2002	1600	National Planning Commission, 10 th plan
VDCs with electricity, 2007	2600	National Planning Commission, 10 th plan
VDCs with fixed phone service	1,761	NTC (peak figure, now less)
Terrestrial television coverage	60%	% of population (MOIC figure)
FM radio coverage	80%	% of population (MOIC figure)
AM radio coverage	90%	% of population (MOIC figure)
Mobile base stations end 2005	Few hundreds	PS-2 project estimate (if proposals adopted)
Shared phones end 2005	180,000	PS-2 project estimate (if proposals adopted)

Figure 3. Some statistics relevant to rural ICT access in Nepal

¹⁰Statistics are latest figures provided in Statistical Pocket Book of Nepal 2002, Central Bureau of Statistics, unless otherwise indicated.

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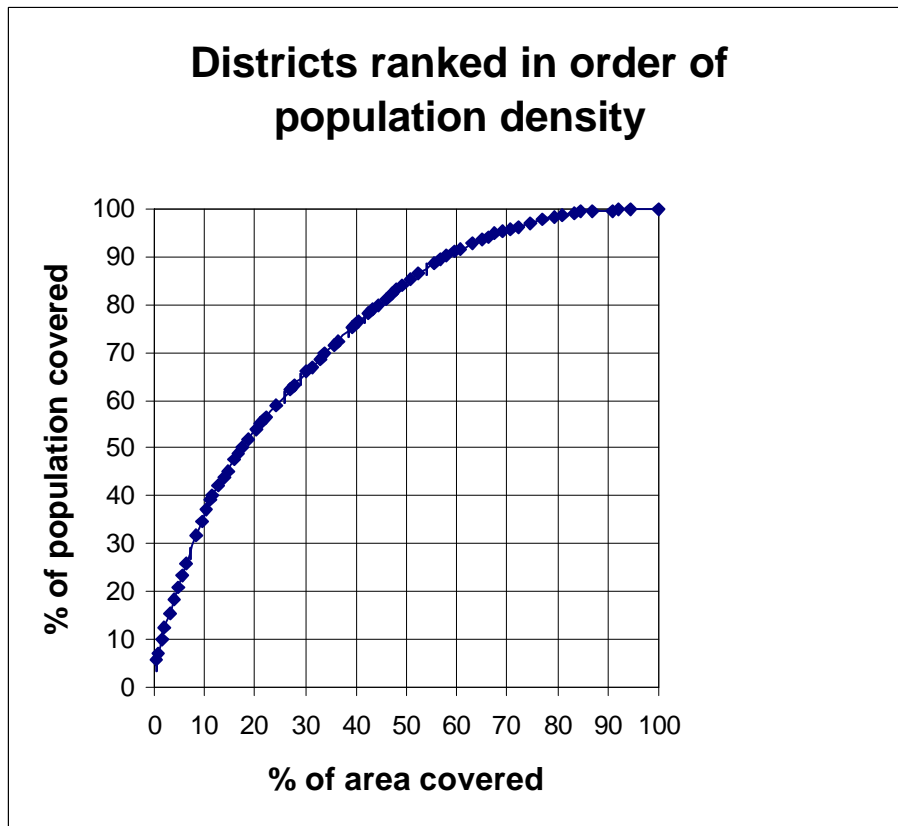


Figure 4 Distribution of population by area in Nepal

Although Nepal's population is mainly rural, it is still strongly concentrated in the more densely settled areas. Figure 4 shows percentages of the population to be found in percentages of area (calculated by adding figures for the 75 Districts together in decreasing order of population density). We see that, for example, more than half of the population lives in less than a quarter of the area. In free market conditions, mobile networks usually cover densely populated areas early in their roll-out. By covering 40% of the land area, mobile networks could reach 75% of the population.

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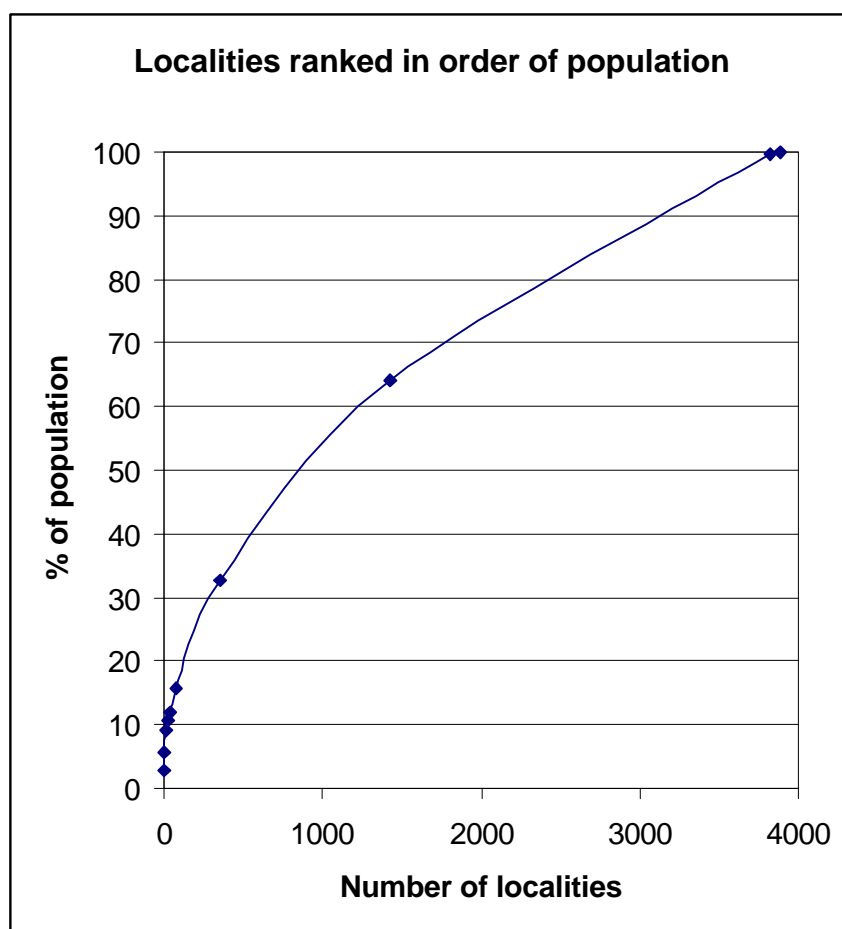


Figure 5 Distribution of population by locality in Nepal

Figure 5 similarly shows how the population is concentrated in a few large localities. This time, all the census localities have been ranked in decreasing order of size. We see that 16% of the population lives in the 71 largest localities (these are the 58 municipalities plus some other towns), and 33% of the population in the 356 largest localities. This is relevant to the provision of expensive facilities such as Internet access, which for a period will mainly be limited to larger towns. Nepalese rural market towns typically attract 15 to 30 times their own population as regular visitors¹¹. If we apply even a much smaller “regular visitor” factor to larger towns, we see that a high percentage of the population could use such facilities when they visit for other reasons, if they were provided in (say) the 150 largest localities. This conforms well with the 140 towns where cable television service already exists, and where we can probably assume that electricity and telephone service are (or have been) available.

¹¹ *Market Towns in the HinduKush-Himalayas: Trends and Issues*, ICIMOD, 2001, Chapter 2, State of Market and Small Towns in Nepal (by Tribhuvan University Central Department of Geography team)

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2.2 Approach to development in Nepal

As in many other developing countries, the currently favoured approach to development projects is "social mobilisation". In Nepal, social mobilisers encourage local people to form Community Organisations at the settlement level. Each Community Organisation consists of 20 to 30 neighbours who typically meet fortnightly. They run group savings schemes, identify local needs and work for improvements (with development projects where these exist). The Nepalese Government has stated its commitment to this approach: the Local Self Governance Act 1999 set the framework for participatory decentralised decision-making, and the National Planning Commission has pledged that all villages in the country will be included in Village Development Programmes by 2005.

Social mobilisation has now been adopted as a vital part of integrated development strategies by practically all aid agencies. The World Bank's overview of poverty in Nepal and approaches to poverty alleviation¹² strongly supports social mobilisation. The current World Bank Nepal Country Assistance Strategy Progress Report¹³ focuses on improved governance as a precondition for progress, and proposes continued decentralisation to Districts, Villages and Community Organisations in order to improve delivery of services such as health and education.

In Nepal, three main programmes are leading the implementation of social mobilisation: Participatory District Development Programme (PDDP), Local Governance Programme (LGP), and Rural-Urban Partnership Programme (RUPP). All three are joint programmes of the Government (Ministry of Local Development) and UNDP¹⁴. Long term, the plan is that these programmes will become part of the normal machinery of government. Between them, PDDP and LGP are active in 60 of Nepal's 75 Districts, while RUPP works in the municipalities and market towns. The programmes, started around 1996, have added new Districts as they have gained strength. The longer-established Community Organisations report impressive achievements, enabling many villagers to find new sources of income and communities to improve their own infrastructure. By 2000, typically 10% to 15% of the Village Development Committees (VDCs) in each District had been reached¹⁵.

¹² *Poverty in Nepal at the turn of the twenty-first century*, World Bank Report No 18639-NEP, 1998.

¹³ World Bank Report No 24170-NEP, November 2002

¹⁴ Other donors are also involved, e.g. NORAD in PDDP.

¹⁵ PDDP and LGP Annual Reports, 2000.

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2.3 Availability of facilities to households

	Electricity	Radio	TV	Telephone
Nepal, 2001 census		53.4	23.8	6.3
2000 survey				
Nepal	24.6	49.7	13.9	3.4
Urban	79.8	71.0	55.4	20.6
Rural	16.5	46.6	7.8	0.9
Terai	23.4	39.9	12.7	2.1
Hills	28.1	59.7	16.7	4.9
Mountains	10.1	44.8	3.5	1.2

Source: BCHIMES, Central Bureau of Statistics

Figure 6 Percentage of households with certain facilities, 2000

Figure 6 shows the availability of electricity, radio, TV and telephone as found by a national survey during 2000. The low availability of electricity in rural areas plainly limits the rate at which it is sensible to provide electronic ICTs. Alternative power sources such as batteries, solar power, or wind-up chargers may be feasible for emergency use, for pilot projects or for devices such as radio receivers or mobile handsets which consume little power. However, given the importance of an electricity supply in its own right, it seems reasonable to suppose that most fixed telecommunications connections both should and will follow (not precede) the provision of electricity.

The relatively high take-up of radio is striking. The same survey also shows a high use of radio by women. For example, 44% listened to the radio at least once a day (those without their own set often listening to a friend's or neighbour's). Figure 7 shows that radio is the main source of health information for women (the top source for all three topics mentioned).

Topic	% of women who are aware of topic	% of those aware who heard via radio	Next biggest source of awareness
HIV/AIDS	39%	79%	TV, friends (each 39%)
Sexually transmitted diseases	30%	83%	TV (40%)
Family planning	100% ¹⁶	48%	Friends (31%)

Source: Report on the Situation of Women, Children and Households 2000, Central Bureau of Statistics

Figure 7 Health awareness and its sources

A 2000 report by the Institute for Integrated Development Studies¹⁷ provides useful communication profiles of four selected Districts (Rupandehi, Palpa, Mustang and Jumla),

¹⁶ 100% of currently married women aged 15-49 years.

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including not only the availability of the different modes of communication but also how they are used.

¹⁷*Universal Access to Information – present situation and agenda for action*, an exercise on grassroots communication and information policy and strategy for Nepal. 49 pages. Institute for Integrated Development Studies, Nepal, May 2000.

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3. RURAL ICT ACTIVITY IN NEPAL

There is a considerable amount of relevant activity already going on in Nepal, much of it still at the planning stage. Descriptions of several projects are provided in Annex A, and Figure 8 summarises the state of play in key sectors.

Education	Computers provided to 100-150 secondary schools. Primary teacher training uses daily radio broadcasts. Plans for Open University within 3 years using broadcasts.
Health	Regular radio broadcasts. Healthnet online database for professionals.
Agricultural advice	Regular radio broadcasts. Online access to market prices.
Postal service	Plans for e-post between 18 Post Offices in 5 years.
Official certificates etc	Mainstay of “e-governance” pilot projects – telecentres being installed in 9 municipalities and 8 rural market centres, plan to extend to 33. Land records computerised in one District.
Planning, general	Computers now in all District Headquarters for general development, health, education; some are linked to Internet. Geographic Information Systems producing detailed resource maps using bottom-up data. Successful community radio stations in a few places. Satellite radios working in 38 VDCs. Rural telecentre pilot project – 2 out of initial 15 are (near) operational, plan for 1500 to follow.

Figure 8 Current and planned activities using electronic ICTs for rural service delivery

Many of these initiatives are still very new and it is too soon to evaluate them. Notable successes include HealthNet and the Palpa community radio stations. Two other planned projects illustrate obstacles to development in Nepal:

- The UNDP South Asia Poverty Alleviation Programme planned to put 16 telecentres into rural areas selected for their “readiness” – e.g. villagers’ enthusiasm. This project was stopped when about to go live in 2002 by a sharp deterioration in the security situation.
- An Asian Development Bank proposal to link bank branches and financial institutions by a fibre optic and VSAT network. This project was felt to be desirable because NTC did not provide leased lines for the purpose. A detailed feasibility study has been carried out, but it has not yet gathered enough support from the banks for implementation.

We observe that there is quite a lot of relevant activity, but little co-ordination and no overall planning for provision of electronic ICTs for rural service delivery. Facilities provided do not necessarily match with priority needs. No mechanism has yet been established for feedback of lessons learned into later projects.

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Referring back to the discussion above of direct and indirect ICT applications, it is clear that there is ample room in Nepal for much more development of both kinds. The balance to be struck between direct and indirect applications is for discussion.

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4. RURAL ICT EXPERIENCE IN OTHER COUNTRIES

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.

4.1 Evaluations of experience in a range of countries

In Annex B, 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.
- 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.

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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, notably in section 5.

4.2 Examples of relevant projects

4.2.1 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 Bhutan¹⁸. 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:

- 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

¹⁸ *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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- 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

4.2.2 Local radio station in Kothmale, Sri Lanka

In Kothmale, Sri Lanka¹⁹, 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 evaluation²⁰ 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
- 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)

4.2.3 Internet kiosks in North India

In the two relatively prosperous North Indian states of Punjab and Haryana, contrasting projects TARAhaat and Drishtee²¹ have aimed to provide Internet kiosks on a commercially sustainable basis. TARA (Technology Action for Rural Advancement) has

¹⁹ The project's own website is at <http://www.kothmale.net/>

²⁰ *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

²¹ *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

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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.

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Electronic ICT	Typical owner start cost	Typical owner yearly cost	Comms mode	Content type	Content access skills	Typical mode of use	Other activity while using	Mobility	Extras for public use	Content choice	Typical content storage device	Content creation skills
Radio	\$5	\$1	One to many	Speech, music	None	Group listening	Most activities	Portable	None	Some channels	Audio cassette	Medium
Television (terrestrial free-to-air)	\$100	\$10	One to many	Moving pictures, speech, music	None	Group viewing	Seated manual eg mending; rest	Fixed	None	Some channels	Video cassette	High
Mobile phone	\$80	\$40+	One to one	Speech, text	Low	Single user	Walking or travelling	Portable	Attendant	Personal	Voicemail	Speech – none Text – medium
Fixed phone	\$100	\$100+	One to one	Speech	Low	Single user	Hardly any	Fixed	Shelter, attendant	Personal	Voicemail	None
Fax	\$150	\$100+	One to one	Text, still pictures	Literacy	Single user	None	None	Shelter, attendant	Personal	Paper	Literacy
Stand-alone computer	\$800	\$20	None	Text, still pictures, sound	High	Single user	None	Fixed	Special shelter, skilled attendant	Depends on software provided	Compact disc, paper	High
Narrowband Internet	\$1000	\$250	Any to any	Text, still pictures, sound	High	Single user	None	Fixed	Special shelter, skilled attendant	Unlimited, for educated English speaker	Compact disc, paper	E-mail – medium Other - high

Figure 9. Some typical characteristics of electronic ICTs that are relevant in Nepal

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5. CHARACTERISTICS OF DIFFERENT ICTs

Figure 9 compares some key characteristics of the electronic ICTs that seem most relevant in Nepal today. They appear in the order of increasing typical cost of ownership. (These cost figures are very rough order-of-magnitude estimates; annual phone costs normally rise with usage). This is the same order in which these ICTs are now being taken up in many developing countries, and is also the order in which it seems to make best sense to promote them in rural Nepal.

Traditional print media (such as newspapers) are of limited appeal in rural Nepal, because of low literacy levels and also physical transportation problems. Electronic ICTs, especially with wireless delivery, open huge new opportunities. Even the most remote regions can already be reached instantly by satellite, if only the right receiving equipment is there.

For rural Nepal, broadcast radio has several important advantages. Most obvious is its much lower cost than other electronic ICTs, which is further reduced by the ease of group and public listening. But also worthy of mention is its ease of use. Listening to an own-language broadcast requires no special skills, and can be carried on in parallel with most other activities, including moving around. Thus a villager can be informed or entertained while continuing with his or her daily work. This is no small consideration for poor people who need to work constantly in order to survive.

At a higher cost, television shares many of the advantages of radio and brings its own advantage of moving pictures. These have great entertainment value and educational potential. The “tethering” needed to watch television provides rest to viewers, which is pleasant and beneficial – but to some may feel like an unaffordable luxury. Access to both radio and television can easily be shared with neighbours, and community access to these media is not hard to arrange, so even the poorest people can benefit when they arrive in the village.

Next come telephones, mobile and fixed. Not many years ago, their order in the table would have been reversed. But now that mobile has achieved lower costs than fixed for most users, along with the important extra advantage of mobility (text message service is another plus), it is the clear winner of the two for rural Nepal. The only advantages of fixed over mobile technology are lower costs for high users, and higher available bandwidth for data transmission (important for Internet).

The key benefit of telephones is real-time one-to-one both-way speech, the natural way to communicate for almost everyone. It is the first ICT in the set which opens the opportunity of content creation to the end user. While individual ownership is relatively expensive, shared use of a single phone is much cheaper and requires little special provision or unusual skill. At normal competitive tariffs, many poor people should be able to afford to make occasional calls.

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How appropriate is Internet for rural Nepal?

At a much higher cost, Internet provides a whole new dimension of information and communication – but only to (or through the agency of) people who have acquired significant skills. Its limitless information resources are actually explored in depth only by relatively few.

At present, Internet does not appear to be an especially appropriate information medium for rural Nepalis. Relevant own-language content mainly has yet to be created²². Furthermore, there are various alternative and generally cheaper ways to make this content available. Static content (which does not change rapidly) can often be stored on CD-ROM and made available for off-line use. This is more convenient when telephone service is scarce and unreliable. Popular rapidly-changing material like news, weather forecasts and market prices often can well be (and already is) broadcast. Reasonable quality moving pictures (an important element of most distance education) require expensive broadband Internet, or can be provided using television or videocassettes. Similarly, the early e-governance application which provides forms for completion is a static one, and could probably be provided at least as well on CD-ROM.

Internet as a communication medium certainly offers attractions for rural Nepalis. In particular, e-mail and bulletin boards may open up new possibilities for interaction with contacts abroad. These are faster than post; and cheaper, and probably easier to organise, than phonecalls. These services can reasonably be used by an illiterate person with the help of a literate (and trustworthy) “scribe”. (By contrast, chat and instant messaging, which are popular (especially among young people) wherever Internet has become widespread, require personal literacy).

Internet access can of course be shared by taking turns to use it (as in a cybercafe or telecentre – these are very similar, though telecentres generally charge less and provide more support). Individual session times are often relatively long, limiting the number of people who can use a single terminal in a day. Simultaneous shared use is difficult. The personal computer that is the common Internet interface today only allows for one active user, with a few closely gathered onlookers (being a “lean forward” interface, unlike the “lean back” of television). Large group use (such as is suitable for training sessions) is much easier with a projector; but this is an expensive and delicate item.

Stand-alone computers are valuable tools in their own right, though requiring a similar skill level to Internet. Stand-alone applications such as skills training, word processing and accounts can well be offered before or alongside Internet access in a telecentre, especially as they can be used when the link goes down.

²² The recent launching of UNICODE in the Nepali language (Devanagari script) will pave the way for Nepali content development (personal communication from Manohar Bhattarai).

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6. ICTs IN RURAL NEPAL - SOME ISSUES

6.1 The rural-urban dimension

The terms of reference for this sub-project relate specifically to rural areas. However, improved facilities in towns may be an effective way to bring the benefits of electronic ICTs to rural areas. Figure 3 gives indicative numbers of population centres of different kinds. The indirect ICT applications discussed in 1.4 are one example of how rural people can benefit from facilities located in Kathmandu or another large town. Direct applications provide other examples:

- As is illustrated in Figure 10, a public telephone or a cybercafé in a market town may be accessible once a week without additional travel for a large number of rural residents who need to sell their produce. Provision of Internet access would be a natural part of the existing plan of the Ministry of Housing and Urban Development, to promote a few selected market towns in each District for fast-track development.
- Many young people continuing their education will need to leave their villages, and the institutions that they attend are prime candidates for equipment with television and Internet. In due course, as these students return home with their new skills, they will lead the demand for (and possibly the supply of) better ICTs closer to home;
- people's government business which entails a trip to a town may be faster and more efficiently transacted by electronic means available in that town – thereby saving nights spent in the town and a return trip.

	Mountain	Hills	Terai
Number of Districts surveyed	3	6	8
Average number of market centres per District	11.3	12.5	15.2
Average population served per market centre	10,000	22,000	31,000
Average area served per market centre (sq km)	221	206	160

Figure 10 Typical reach of rural market centres²³

Of course, any rural ICT strategy must be linked with and should build on the relevant national strategies²⁴. Several of its objectives relate to rural areas, but as the planned actions focus on higher education and the creation of centres of excellence, they will inevitably tend to favour urban areas.

²³ Table adapted from *Market Towns in the HinduKush-Himalayas: Trends and Issues*, ICIMOD, 2001, Chapter 2, State of Market and Small Towns in Nepal (by Tribhuvan University Central Department of Geography team). In the reported survey, a market centre is defined by its number of commercial units (shops, banks etc): 5+ in the mountains, 10+ in the hills and 20+ in the terai.

²⁴ The main part of PS-2 is producing a new National Telecommunications Policy. The *Information Technology Policy 2000* is online at <http://www.can.org.np/ictpolicy.pdf>. Several background studies carried out for the National Planning Commission when this policy was being prepared in early 2000 have also been made available to this sub-project.

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Market centres are natural locations for private entrepreneurs to offer computer services, and also telephone and Internet services once the necessary infrastructure becomes available. The majority of rural market centres already have an electricity supply²⁵. Tourist attractions will also lead to demand for such facilities, which will be supplied by market forces whenever feasible. Public funded provision should take account of such private facilities. This means ensuring that planners have up-to-date information on actual facilities.

The Rural-Urban Partnership Programme (RUPP)²⁶, set up to foster constructive rural-urban linkages, seems the natural body to promote rural benefits through urban activities. Its outreach efforts should also ensure that rural areas can learn from the new applications now coming into service in Nepalese towns.

We propose that:

- A1 By the end of 2003, NITC should carry out and publish its planned national survey of telephone, computer, and Internet facilities. The findings should be provided to the GIS centres for inclusion in their resource maps. From now on, all Districts supplying bottom-up data should be asked to include data on both private and publicly available facilities such as radio, television, telephone, fax, computer and Internet. These data should be used to update the NITC survey results as well as the GIS database.
- A2 The Ministry of Housing and Urban Development has a plan for fast-track development of selected rural market towns. Actual or potential public access to telephone and Internet should be a factor in the selection process and also a facility to be provided in these towns. An achievable target should be set, such as that public Internet access should be available in 150 rural market centres by the end of 2005.
- A3 Any obstacles to private enterprise providing publicly accessible ICT facilities on a commercial basis should be removed (e.g. no permits should be required). Consider positive incentives, such as low-interest loans to enable under-employed young people to buy necessary equipment (e.g. telephones, fax machines or computers).
- A4 Telephone tariffs charged for Internet access should be at reasonable rates. The current per-minute rates for long-distance access (needed where there is no local Internet point of presence) are not reasonable.

6.2 Development project co-ordination

All respondents agreed that telephone, Internet and e-mail are vital to the efficient running of development projects, and that more mutual visibility and co-ordination among projects would be highly beneficial.

²⁵ Personal communication from Dr Nanda Gopal Ranjitkar, Central Department of Geography, Tribhuvan University.

²⁶ <http://www.rupp.org.np/activities.htm>

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According to the latest available UNDP Nepal Development Co-operation Report²⁷, in 1999 there were 22 multilateral and 18 bilateral government aid agencies active in Nepal, plus 21 international NGOs. The total annual funds committed amounted to over \$400m (some 8% of Nepal's Gross National Product) and involved hundreds of separate aid programmes and projects. Probably all of these now have Internet access, and are using e-mail wherever possible to contact their own staff; most have a web presence. In addition, an increasing number are using telephone, fax and e-mail in the field to support interaction with rural people. They would do so more if network connections were available in the rural areas.

It is noticeable that there seems to be no central co-ordination of electronic ICT projects for rural development in Nepal, although if people are aware of related projects there should be useful scope for sharing of experience, and maybe also for sharing of tangible resources such as equipment and expertise. The best current sources of project lists seem to be:

- The UNDP's Nepal Development Co-operation Report (already mentioned) includes inventories of ongoing projects by sector across all funding sources. The Communications Sector list mentions US\$92m worth of commitment to NTC's infrastructure development, plus 8 smaller projects totalling US\$3.8m of support.
- With technical support from the National Planning Commission GIS Facility run by PDDP, UNDP Nepal has mapped all UN related project locations throughout the country. Each project location is also linked with detailed information, such as name of the project, funding and implementing agencies, coverage, period, sector.
- HMG's Development Gateway website²⁸ provides a valuable collection of links to major development projects which have an online presence, and many of which also have a significant ICT component.

Of course, many projects with significant ICT components may appear under other sector headings; and the value of co-ordination extends across all areas of development. Enhanced mutual contacts among projects, with the possibility of more co-ordination and co-operation, are also needed within each District. All Government Departments and many NGOs have a hierarchical structure, for example with District offices reporting to Regional offices which in turn report to Headquarters. These local/central links also need to be strengthened.

Within central government, the National Information Technology Centre, part of the Ministry of Science and Technology, has already been assigned a co-ordinating role for Information Technology initiatives. It is now starting to get involved in projects with vital communications components such as the multipurpose telecentre pilot project. It is highly desirable that a single Ministry should have overall responsibility for developing Nepal's Information and Communications infrastructure and for co-ordinating the involvement of all other Ministries.

²⁷ <http://www.undp.org.np/publications/dcr2000/index.html>

²⁸ <http://www.devinfonepal.gov.np/>

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We propose that:

- B1 In order to provide a clear framework for relevant activities, the National Planning Commission should add a paper on ICTs for development (including, specifically, rural development) to its series of e-consultation papers²⁹, and keep this updated in the light of comments received. This should cover the full range of ICTs, both traditional and electronic.
- B2 Under a single Ministry with overall responsibility for all electronic ICT infrastructure and access, the strength and capabilities of the National Information Technology Centre (NITC) should be built up to enable it to become the focal point for co-ordination, planning and support for all development projects using electronic ICTs. It will encourage outside investment in electronic ICT projects.
- B3 By the end of 2003, NITC should set up an open bulletin board and/or e-mail list for sharing of news about electronic ICT developments in Nepal among all interested parties. Based on growing experience of rural multipurpose telecentres, NITC will maintain guidelines on how to run these, including what equipment, staff and facilities are needed, locations and opening hours, and charging policies.
- B4 NITC will ensure co-ordination of the rural multipurpose telecentre programme with the rural electrification programme and with the rollout of fixed and mobile telephone networks.
- B5 NITC will also run a library of locally appropriate content, which can be made available in different formats as required (e.g. on CD-ROM as well as over the Internet, enabling stand-alone computers to use the material).
- B6 The development community should sponsor an online searchable database of current and planned development projects. Each project record should include details of resources used as well as the basic project data (aims, funding, timescales, Districts covered, contacts) already sought for the UNDP inventories, and the date of the last update. NITC seems a natural place to host the database.
- B7 Within each District, an ICT co-ordination committee should be set up including representatives of the VDCs, line agencies of government, any NGOs active in the area, private entrepreneurs and any other interested parties. The Co-ordination Committee should be responsible for liaison both within the District and with the centre (Ministry of Information and Communication and other concerned Ministries), with the aim of ensuring both appropriate local ICT provision and the fullest possible use of what is provided

²⁹ <http://www.ndf2002.gov.np/consult.html> Existing sectoral papers cover agriculture, water, education, electricity, health, irrigation, roads, and construction; issues papers cover reform of governance, finance, and state-owned enterprise as well as decentralisation, private sector and rural development, and civil society partnership.

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6.3 District roll-out programmes

A major theme of this report is the marked differences in local conditions, achievements and aspirations in different parts of Nepal. Box 1 to Box 3 below illustrate this by sketching the current situation with regard to electronic ICTs of three fictitious Districts, along with some possible 5-year development targets for each. The maps in Annex D (of three real Districts) give a more vivid idea.

District A is in the Terai, bordering India. All settlements are accessible by motorbikeable tracks. Population depleted by migration to India for work (especially young men). High proportion of lower status social groups.

Fixed telephone service reaches the District HQ town and 20 of the 50 VDC HQs. Fixed phones are installed in government offices (not accessible to the general public), village shops in 10 villages (accessible to the general public) and in a few homes of better-off families (rarely used by neighbours). This leaves more than 90% of settlements without phone service. The average journey time by bicycle to a publicly accessible fixed phone is 45 minutes.

There is no Internet access at all yet in the District. The nearest access point is in a town in the next District, 3 hours by bus from District A HQ. There is fringe mobile coverage from India. Many households have radio receivers and television has reached all settlements. National programming for both TV and radio is received but is found of little interest.

Possible District A 5-year electronic ICT development targets:

- Full mobile coverage of the whole District, mutual roaming with India
- Mobile phones available for shared public use in all settlements
- Publicly accessible Internet in District HQ and all Post Offices (these also provide e-post services)
- A community radio station with Internet access located in the District HQ, with broadcasts reaching the entire District
- A television in every secondary school

Box 1 A fictitious District in the Terai

District B is in the hills, with District HQ an hour's drive from a city with cybercafes and mobile coverage. The furthest settlements are an hour's journey on foot from their VDC HQ, most of which are up to an hour's journey by motorbike from the District HQ.

Fixed telephone service reaches the District HQ town and 40 of the 50 VDC HQs. Fixed phones are installed in government offices (not accessible to the general public), village shops in 20 villages (accessible to the general public) and in homes of about 100 better-off families (used occasionally by neighbours). This leaves more than 1400 of the 1500 settlements without phone service. The average journey time on foot to a publicly accessible fixed phone is 1.5 hours.

There is no mobile coverage yet in the District, but some better-off people who work in the city are beginning to acquire mobile phones, which they can use during the working day and on part of the journey to and from work. Most households have radio receivers and television has reached all settlements. National programming for both TV and radio is received and appreciated.

Possible District B 5-year electronic ICT development targets:

- Full mobile coverage of the whole District
- Fixed lines to all VDC HQs
- Publicly accessible fixed phones in all secondary schools, post offices and health centres
- Publicly accessible Internet in District HQ, the largest 50% of secondary schools and the busiest 50% of Post Offices (these also provide e-post services)
- A computer in every secondary school.

Box 2 A fictitious District in the Hills

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District C is a remote, sparsely populated and very poor mountainous District. Fixed phones have reached only the District HQ town (service is delivered by satellite). There are no motorable roads. The average time to reach a publicly accessible phone is 3 hours on foot, but this phone is often out of order. There is no mobile coverage, nor is there ever likely to be any on a commercial basis.

Radio broadcast reception is poor and national TV reception non-existent. In the District HQ town, there are a few hidden satellite dishes picking up Indian programmes.

Possible District C 5-year electronic ICT development targets:

- A satellite dish in each VDC capable of receiving both national and international broadcast transmissions
- Terrestrial wireless systems centred on each VDC HQ and covering surrounding settlements (20% of total population), capable of passing on broadcasts and two-way voice traffic
- On national list for coverage by least-subsidy tendering process for extended mobile services
- A computer-literate teacher in every secondary school

Box 3 A fictitious District in the Mountains

Closely related to the co-ordination issues discussed in 6.2, but worth discussion in its own right, is the issue of how Districts are chosen for the location of development projects. A typical project focusing on a certain topic (whether health, forestry, bridge-building, Internet access or whatever) starts with pilot projects in just a few Districts. It may spread gradually to more Districts, and some years on, depending on the success of the undertaking, may be adopted as national practice.

Plainly the Districts that are chosen for pilot project and early project location have an advantage over those that are not, so it is worth understanding how these choices are made. There is no systematic approach. Each responsible agency makes its own decisions based on a combination of factors³⁰, including:

- Need for a project of this type (e.g. bridges are needed mainly in mountain districts, or a focus on poverty)
- Desire for a spread of experience (may lead to setting up pilot projects in widely scattered locations, covering different types of terrain, different social and cultural groups etc)
- Degree of enthusiasm, organisation and relevant experience of local people (e.g. existence of Community Organisations, earlier projects)
- Accessibility and safety for project staff and property (e.g. security situation, closeness to roads, existence of infrastructure such as power supply and communications)
- Convenience of collaboration with other related projects, within the same organisation or not.

³⁰ A good example of explicit consideration is provided by the Danish NGO Mellempøkeligt Samvirke (MS) Nepal, Danish Association for International Co-operation, on their website at http://www.msnepal.org/reports_pubs/ekchhin/jan2000/16.htm#top.

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The end result of a large number of independent decisions of this kind is that some Districts end up with many more projects and much more externally funded expenditure than others, but this does not reflect underlying needs at all well³¹. Some Districts suffer from long-standing, even systematic, neglect³², while others are relatively favoured. It is noticeable, for example, that most Districts where ICT projects are happening have high OCID ranks. Evidence supplied by the PDDP suggests that discrepancies between VDCs within Districts may be even more marked than differences between Districts³³.

In section 5 we have discussed how different ICTs may match the needs of communities at different stages of development. Enhanced communications infrastructure can make a big difference to areas that need to catch up. ICTs should be on every District's development agenda, in the form and at a time that is most suitable to local circumstances.

We propose that:

- C1 Working through LGP, PDDP and/or similar channels (as available), each District in Nepal should consider ICTs as part of their regular overall development proposals, and include what ICT services, equipment and skills they think appropriate in their periodic plans and bid for funds.
- C2 The LGP and PDDP should jointly produce simple briefing material for Districts (such as illustrated booklets and/or videotapes), suitable for distribution to anyone interested, which explains in local language the applications of different electronic ICTs, and includes real-life examples of how people in other Districts are benefiting from them.
- C3 LGP, PDDP and RUPP should jointly produce guidance for senior District personnel on what electronic ICTs are most likely to be beneficial in what conditions (e.g. a computer with CD-ROM drive could be very valuable in a secondary school before a telephone connection permits Internet access, but should only be provided if there is a member of staff competent to supervise its use).
- C4 When electronic ICTs first arrive in a place, an awareness campaign should be mounted to ensure that local people understand what is now available and how they can benefit from it. Campaign materials suitable for everyone (such as posters or radio broadcasts) should be supplied centrally. Especially in the early days of roll-out, ensure that the campaigns reach all those who may use the facilities, bearing in mind that they may live quite far away, even in a different District.

³¹ This situation is well documented in (for example) the UNDP Development Co-operation Report (see footnote 27) and Districts of Nepal – Indicators of Development, ICIMOD 1997.

³² See, for example, *Governance in the Karnali – an exploratory study*, Enabling State Programme, August 2002. Summary available online at <http://www.esp-nepal.com/private/page11.htm>. See also Karnali Integrated Rural Development and Research Centre website at <http://www.kirdarc.org>.

³³ Poverty Mapping Reports of Kaski and Tanahun Districts, Resource Mapping Reports of Kanchanpur and Tanahun Districts, PDDP, 2000-2002.

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- C5 Training should be provided for telecentre staff (including benefits of telephone usage and “Internet scribe” skills where needed). These people may overlap with “community IT-mobilisers”.
- C6 HMG and the development community should especially support funding bids from community-based organisations with high membership among the most disadvantaged groups (e.g. Dalits and women). Consideration should be given to adjusting the ratios for matched funding in order to favour these groups.

6.4 E-government applications and multipurpose telecentres

The terms “e-government” and “e-governance” are both used in varying ways. Here we use them as follows:

- E-government is a very broad term, meaning any use of electronic ICTs for processes of government and service delivery (including, for example, health and education services).
- E-governance (or “transaction e-government”) is a much narrower term, meaning the use of electronic ICTs to enable citizens to transact official government business more efficiently. The usual examples are the issuing of individual official documents, such as certificates and permits, using computerised procedures.

Already most government officials can be reached by telephone, at least in principle. With the expected growth in telephones, it will become more important and more useful for officials who need to be in touch with the public to publish their contact telephone numbers.

The next step in e-government must be to get all government departments to put up websites and to publish all key information there, including contact telephone numbers and e-mail addresses. This will greatly increase transparency. Documents will only be read by those few with the interest, ability and inclination, but as this will include analysts and journalists more people will benefit. Equally, other government departments should become better informed about each other’s activities. Figure 11 illustrates the expected effects.

We find that current activities in Nepal using electronic ICTs for delivery of health services, education and agricultural advice (summarised in Figure 8, with more information in Annex A) are appropriate, if limited. We agree with the choice of broadcasting as the primary way to get important messages to the people. At present, teacher training must be top priority for education, and provision of preventative healthcare messages and essential medicines must be top priority for health. The strategy proposed above for providing information and communications infrastructure to Districts aims to ensure that more advanced facilities are at the disposal of local agencies of all government departments at appropriate times.

The current ideas of NITC relating to installing 1,500 multipurpose telecentres in rural Nepal have yet to be elaborated. The locations for these telecentres, the equipment and

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services to be provided and their financing arrangements are all undetermined. The basis for the target of 1,500 is not clear, though it matches well with the number of rural market centres. All these aspects will benefit from review in the light of experience with the early pilot projects. The plans plainly also need to be fitted together with aspirations expressed by the Districts, progress with rural electrification, and facilities which are provided by other parties.

For the following reasons, direct e-governance applications in rural Nepal will be more beneficial at a later stage, when Internet access has already become familiar:

- The benefits of e-governance to any individual are limited by the frequency with which the relevant transactions are required. Obtaining an identity document or a land certificate may well only be needed once in many years.
- Simply computerising unnecessary or excessively bureaucratic procedures may actually be counterproductive, as it could prolong their life. Computerisation should be the spur to rationalise procedures, e.g. to minimise the number of separate forms and signatures that are needed.
- As noted in Section 5, application forms can at least as easily be provided on CD-ROM, and this may be felt worthwhile so as to save valuable Internet access for uses that really need it. True electronic transactions (which would need an online capability) in any case await the development of electronic signatures.

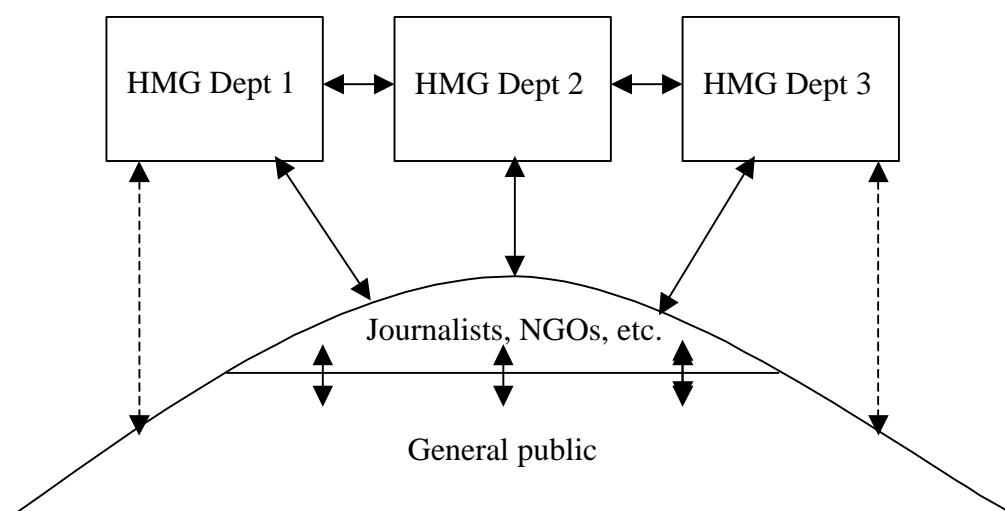


Figure 11 A staged approach to e-government

The project therefore recommends a staged approach to e-government:

- D1 In 2003, connect all Departments of central Government to the Internet. By the end of year 2004, all government departments should establish informative websites, which are regularly updated and make available all main documents published, with contact telephone numbers.

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- D2 By the end of year 2005, in those Departments with responsibilities for service delivery to end-users (e.g. Agriculture, Health, Education, Post), all staff whose jobs require completion of secondary education (or above) will be Internet- and e-mail-literate and will use e-mail for internal and external communications. This is necessary both to provide open Government, and to facilitate the use of Internet and e-mail by rural development projects. Websites should include e-mail addresses for relevant government officials, and facilities for feedback or forum discussions.
- D3 The NITC should devise a longer-term plan for introducing interactive e-governance applications, where the procedures to be automated have been simplified as far as possible.
- D4 NITC should proceed with the early part of its pilot multipurpose telecentre programme (up to 15 centres), ensuring that the experience gained is widely shared. The later part of the programme should be reviewed within two years in the light of early experience, community demand and other developments. The programme should be co-ordinated with the Ministry of Information and Communications, as it is planned that the mobile tender will include public Internet access (at two sites per mobile base station), and with other agencies piloting multipurpose telecentres (examples are given in Annex A).

6.5 Broadcasting

Radio³⁴ and television will be invaluable ways of bringing awareness of the outside world and development messages to the most remote regions. A near-term priority, already achievable at reasonable cost, should be to ensure adequate radio signal reception everywhere and at least one working radio receiver in each settlement (of say 50 people or more)³⁵.

Community radio has already proved its worth in Nepal and should be given every support, including the grant of wireless licences to organs of local government with minimum cost and difficulty³⁶. All independent radio and television channels should be prepared to carry some agreed public service programming (such as the health, agriculture or educational material mentioned below).

It is well recognised that serious messages are most easily absorbed if they are presented in an entertaining way. Indian village life TV soap operas including development material have achieved large followings and significant effects. Nepali broadcast producers will doubtless build on this good example.

³⁴ For long the “poor relation” in development circles, radio seems to be enjoying a return to favour. See, for example, *Radio – the One to Watch*, edited by Bruce Girard, at <http://comunica.org/1-2-watch>

³⁵ The NGO Equal Access <http://www.eqaccess.org/ourprograms/dbi-ap.html> is already active in Nepal. It transmits public interest programmes in Nepalese over the WorldSpace satellite (<http://www.worldspace.org/asiapac.html>). The programmes can be received anywhere in Nepal that is equipped with a receiver costing around US\$100.

³⁶ The NGO Communications Corner (Commoner) <http://www.comconnepal.com/index.htm> produces independent radio programmes, working with community radio and other FM radio stations.

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Television is normally spontaneously popular once available. Universal television coverage (with at least one working TV set per settlement over the minimum size, and adequate quality reception) is a longer term objective than universal radio, but still achievable at relatively moderate cost. Another obvious example to follow is that of own-language subtitling on television. This is a very low-cost way to help to build literacy.

Radio programmes are already well-established in Nepal as an educational aid, having been used since 1978 for teacher training. More information is provided in Annex A. The Distance Education Centre needs support to equip all the training Resource Centres (where trainees attend once a week) with televisions and cassette recorders for both audio and video programmes. Monitoring reports show that many trainees find the times of broadcasts inconvenient. Personal audio cassette recorders could help them to avoid missing the lessons, and also to repeat any passages that they have found difficult.

Television has great educational potential, and even better if supplemented by a video cassette recorder to enable programmes to be stored. It could partly make up for the shortage of trained teachers. Provision of television to schools, with suitable educational programmes, should be a higher priority than provision of Internet. In the first instance secondary schools should be equipped with television, followed by lower secondary schools and, later, primary schools.

An Open University for Nepal, using practically all forms of ICT, is hoped for within about three years.

We propose that:

- E1 MOIC (with donor support if necessary) should ensure adequate broadcast radio signal reception everywhere, and at least one working radio receiver in each settlement, by 2007. Satellite radio should be used where necessary to reach people who live out of range of terrestrial broadcasts.
- E2 Community radio has already proved its worth in Nepal and should be given every support, including the grant of wireless licences to organs of local government with minimum cost and difficulty. All independent radio and television channels should be prepared to carry some agreed public service programming. As Internet access becomes available, co-siting community radio stations and Internet access points will lead to useful synergies.
- E3 Universal television signal coverage of Nepal's population should also be a target for 2007 (using satellite reception only where necessary, and ensuring adequate quality signal). Community television receivers should be available everywhere with existing signal coverage by the end of 2005.
- E4 Consider provision of individual audio cassette recorders to help trainee teachers to listen to all their radio broadcast lessons. Next priorities for electronic ICTs in education are television programmes for trainee teachers (along with adequate access to television sets for all trainees), the provision of radios and televisions to schools

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and schools programming. Support the Distance Education Centre's plans for developing its services.

6.6 Postal and telecommunications services

The main part of this PS-2 project proposes policy changes aimed at greatly increasing the availability of telephone service in rural Nepal. We expect simple telephone service to be of huge benefit to everyone who can access it. For example, it will enable farmers to find out the prices at which local crops are selling in different market towns; medical help or advice to be obtained; and time and money to be saved by making business appointments in advance of arrival. As more people get phones, the usefulness of telephone service continues to grow.

The postal service is currently the only two-way communication service available to a large majority of Nepalese. In 2001³⁷, the Nepalese Post Office carried 72 million inland items and 20 million foreign items, plus 147,000 inland express items and 32,000 foreign express items. Compared with 2000, inbound foreign mail was down by 27% (attributed to e-mail and voicemail) but express mail was up by 28% (this is now a competitive market). Total revenues of the postal service were 227 million NR, and total expenditure 899 million NR.

Although these financial figures are discouraging, the Post Office has many valuable assets which it should be possible to exploit to good advantage. Post Offices are conveniently located and easily identifiable; they often serve as community centres where people gather to share information and may have suitable space where a computer or Internet terminal could be placed; postmen have contact with every household, and read out letters and write letters for illiterate people. In India, postmen are now being given mobile phones to act as "mobile public call offices" when they go on their rounds³⁸ – an example that could well be followed in areas of Nepal that are within mobile network coverage.

Provision of e-post (full or partial)³⁹ between post offices could significantly improve services for many poor people. While equipping all 4,000 post offices for e-post may have to be a long-term target, the current plan to equip only 18 main post offices plus 15 remote post offices in 5 years seems too modest. A more ambitious postal modernisation programme should be achievable, especially if it is carried out in co-ordination with other projects. Already, local government projects are bringing Internet access to practically every District Headquarters. The prospects for sharing facilities with Post Offices could be explored. A private-public partnership may have both financial and security advantages.

³⁷ *Nepal Postal Services*, 2001 report in English, Postal Services Department.

³⁸ See chapter 9.4 of the 2002 Indian budget paper at www.indiabudget.nic.in.

³⁹ E-post is a service in which written messages are transmitted electronically between post offices and printed out at the destination office for physical delivery (or may be read out over the phone where possible and appropriate). Partial e-post may also be used, where the origin or destination post offices are not yet equipped for electronic transmission but intermediate offices are so equipped. Fax may provide a low-cost initial form of e-post sufficient for non-confidential communications.

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Another potential application of direct benefit to many poor people is secure funds transmission. A conservative estimate⁴⁰ is that over a million Nepalis work abroad, most of them in India. From Indian post offices a money order service is available to deliver money to Nepalese post offices. Currently the order travels physically between the post offices. This service seems a prime candidate for electronic transmission. Workers in countries other than India do not have even the money order system available and have to resort to various alternatives (mostly expensive, often insecure and sometimes illegal) to send money home. Again, an Electronic Funds Transmission service would be of great benefit. Initial provision could be targeted on the Districts in the Western Hills with the largest numbers of migrant workers.

Keeping in touch with absent family members is another potentially important application of all two-way communications services. International phonecalls will doubtless boom as phones become more accessible and international call prices fall. An Internet directory showing shared phone numbers for villages has been suggested as part of another project proposal (see annex on mobile licensing). A precondition is that Nepal changes mobile call charging from Receiving Party Pays to Calling Party Pays. The poor cannot afford to pay for incoming calls.

A parallel thought, which could be implemented immediately, is to set up a web-based message board for Nepalis abroad. Messages could be organised by place name. People from particular places tend also to cluster abroad, so if only one person from that place accesses the site, he could pass on messages to colleagues. At very low cost, this could enable some contact where currently there is none at all.

Text messages to and from mobile phones offer similar benefits to e-mails (though the messages must be short and cannot normally be printed out). Originally these messages were only possible from one mobile phone to another. Now interworking with the Internet is arriving. Text messages can easily be sent to mobile phones from special Internet websites, and some mobile phone systems allow text messages to be delivered as e-mails. Potentially, a Nepali villager with access to a shared mobile phone (but no Internet) could exchange messages with her son working in India (with access to a cybercafe, but no mobile phone). As both mother and son could be illiterate, they would need literate helpers. Such exchanges could be of great value to the parties, for example to say “Expect a remittance of 5,000 rupees”, “I will return home in August”, or “Please come back, your father is ill”.

Value-added text messages, which could be provided in Devanagari script, offer further interesting possibilities. For example, a farmer could subscribe to a daily text message giving prices for specified commodities in particular markets.

Any interactive service opens the possibility of indirect access to broad information sources (such as libraries) and of course the Internet. The WorldTalk venture⁴¹ has been set up to promote and provide indirect Internet access over the phone using a voice messaging platform.

⁴⁰ Information on this topic is from *The New Lahures, Foreign Employment and the Remittance Economy of Nepal*, NIDS 2001.

⁴¹ <http://www.worldtalk.org/index.htm>

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Applications of two-way technologies (such as Internet access) in any location have to await the provision of network coverage there (the network may be fixed or mobile). Already, fixed telephone service is available in most District Headquarters and Internet access is starting to be provided there. Assuming that the policies put forward by the main part of this PS-2 project are successfully implemented, over half of Nepal's population (including rural areas) will be within fixed or mobile phone coverage by 2006. Any serious amount of Internet use is made very much easier by high-speed data transmission, which at present means a broadband fixed network connection.

We propose that:

- F1 There should be no barriers to the provision of services such as public access telephones, message bureaux (which handle messages on behalf of people without direct access) and cybercafes, and these are likely to grow on a commercial basis following the availability of infrastructure. Additional needs should be identified and fulfilled using the bottom-up framework described above.
- F2 All organisations (HMG or NGO) that get their own phones or Internet access in rural areas should be willing to share these facilities on reasonable terms with other organisations and the general public, for as long as there is an access shortage.
- F3 There should be a plan to provide e-post and secure electronic funds transmission at all Post Offices in places where power supply and telephone connection are available, and where premises are suitable. Following a pilot project to identify and resolve practical problems, all Post Offices that already satisfy these criteria should provide these services by 2005. After that, other Post Offices should be connected progressively to the e-post network when power supply and telephone connections arrive nearby. In some cases, e-post may justify special provision of these services to remote areas. Public-private partnerships should be seriously considered.

6.7 Downsides

Overall, this project obviously supports the widespread view that rural people will benefit from more access to ICTs. But the benefits are not unmixed, and it would be wrong to ignore the drawbacks of bringing electronic ICTs to rural communities.

The first comment, frequently made, is that the new technologies have a tendency to broaden, rather than to narrow, social divisions. The World Bank report cited in the Annex, for example, mentions this with special reference to the Internet; and the Inter-American Development Bank report quoted there provides evidence to support that view. The truth of this is evident. However, this is not a special feature of ICTs. Any desirable innovation that costs money is likely to be taken up first by people who are better-off, better-educated or both. (The World Bank's 1998 report on poverty in Nepal comments on the same effect in agricultural intervention, where better-off farmers benefit more from supplies of fertiliser). Rather than suppress the innovation, the right approach must be to spread the benefits as quickly as possible.

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Another fear is that open media will lead to dilution of local culture and values, as people watch imported movies or browse foreign websites. Even Nepalese media may expose people to advertising for goods and services that they cannot buy. The right way to deal with this must surely be to engage educated Nepalese in providing attractive Nepalese content, and to be sensitive to the commercials that are accepted for broadcasting along with programmes for rural audiences. Again, it is important to recognise that ICTs do lead to profound social change – as of course does all successful economic development.

Similarly, some commentators see networked ICTs as instruments of central control, and their introduction as countering moves towards decentralisation of power. In fact, the effect can work in either direction – for or against devolution – depending on the technology used and who controls it. Decision-makers will doubtless be sensitive to such issues, and it is useful for all parties to be aware of them.

Finally, concerns are sometimes voiced about the Internet providing access to illegal or immoral material. This is true in all countries. Much attention is being devoted to ways of alleviating such problems. As a late adopter of the Internet, Nepal has the advantage that it will be able to use technology and approaches developed elsewhere.

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7. KEY FINDINGS AND PROPOSALS

7.1 Key findings

Given Nepal's mountainous terrain, and especially the difficulty and expense of physical transport, electronic ICTs have a very important contribution to make to its economic development. But they need to be introduced with specific applications in mind and as part of properly managed projects, not as ends in themselves. Many interwoven dependencies must be taken into account, for example:

- a rural Internet access point requires the presence of electrical power, a telecommunications link, and skilled support – all of which are being worked towards by other programmes⁴²;
- once provided, a community television will be of potential value to a wide range of development activities (including education, health, agriculture and new income generation initiatives).

It is important to choose carefully the best ICT for any given application from the wide choice available. Indirect applications of ICTs may often be a cost-effective way of improving rural service delivery. Direct applications are harder to introduce on a sustainable basis.

Conditions vary widely among different Districts. Bottom-up participatory planning will be essential to ensure that the ICTs provided suit local conditions. Top-down planning by outsiders without local consultation may well lead to expensive mistakes. Because electronic ICTs are constantly improving and falling in price, there are advantages as well as disadvantages for Districts which wait a few years for advanced ICTs.

Although our focus is rural development, locating early telecentres in towns may be a good way to reach rural people. Rural market centres are particularly promising locations because many rural people visit them regularly. The lack of power infrastructure is a major obstacle to providing rural fixed phones or Internet. Solar power may be used, but it greatly increases the cost of any installation.

Despite having many shared objectives, the various current projects involving ICTs for development have little mutual contact. Co-ordination and co-operation will be highly beneficial. The lessons available from pilot projects must be shared before larger commitments are made.

The postal service is the only two-way communications service available to the vast majority of rural people. It is especially important given the large number of migrant workers and their need for reliable, low cost money transmission. However, postal services are generally slow, inefficient and running at a large loss.

⁴² The provision of telecommunications links is to be speeded up by policy measures which are the main part of the PS-2 assignment.

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The take-up of computers and the Internet by Departments of central Government is very patchy. General use of these tools by central Government is a prerequisite for their effective use in rural service delivery (whether indirect or direct). It is also a major step towards more open governance.

7.2 Main proposals

7.2.1 National policy

The proposed overall objective for national policy in this area is:

To make available all appropriate Information and Communication Technologies (ICTs) in support of rural development and poverty alleviation, drawing on the full range of options - including, for example, radio, television, video cassette recorders, and stand-alone computers as well as fixed and mobile phones and Internet.

In support of this objective, two points of national policy are proposed:

Ensure that appropriate electronic ICTs are available in rural areas to meet end-user needs, which means at first mainly radio, television and telephones, as these do not require special training or literacy for people to use them.

Foster the full use of appropriate electronic ICTs by workers in both government and NGO rural development and infrastructure projects, which means spreading in particular Internet availability and human capability to use it as fast as practicable down to District level and beyond.

We assume that the proposals in the main part of this project are implemented, which means that over half the population will be within mobile phone coverage by 2006, and a few hundred public Internet access points will have been provided in conjunction with mobile base stations. We also assume that participatory planning will be extended to all VDCs in all Districts by 2005.

7.2.2 Strategy

Our proposed strategy for enhancing access to electronic ICTs and their use for rural service delivery has two strands, in common with the main part of PS-2:

- within the framework of network provision achieved by implementation of the main PS-2 proposals, to give freedom to the private and NGO sector to meet access demands;
- to complement this spontaneous provision by public and international funding for specific projects, where needed.

Because of the high returns to project management from efficient communications, we expect that most indirect applications will be funded spontaneously. Direct applications

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will be harder to justify on a financial cost-benefit basis, and will often need outside funding.

To achieve a good fit to local needs, we propose that specific installations be provided in response to bottom-up expressed demand. A critical enabling assumption is that participatory planning will indeed be extended to all Districts and all VDCs within the next few years.

To maximise value, we propose that this take place within a coherent national framework that facilitates co-ordination and cross-fertilisation among people in different geographic areas, engaged in different kinds of work and at all organisational levels (e.g. national, regional, and local).

We expect that this approach will lead in the next five years to a situation in which:

- Almost everybody in Nepal can listen to the radio, watch television and make and receive phonecalls (or text messages) on a daily basis.
- Most people who are sufficiently educated to use computers and the Internet themselves will be able to do so by travelling to a town which they have other reasons to visit (say, on a weekly basis).
- All District Headquarter towns, and in more advanced Districts several towns, will have multipurpose community telecentres where qualified staff will help anyone who needs help to use a computer or the Internet.
- All agencies of government with responsibilities for service delivery to rural areas will be in a position to take advantage of these new access possibilities. They will use the networks to communicate with their own staff and with the public. They will be producing appropriate content to support service delivery, mainly for broadcasting but also, increasingly, for computer and Internet distribution.

The wider PS-2 project of which this is part is already helping to implement the removal of unnecessary regulatory barriers to the provision of telecommunications networks⁴³. From the viewpoint of this sub-project, three points are key and we assume that they will go ahead:

- creating an environment in which investors will bring to fruition Nepal's commercial potential for network provision – especially in mobile telecommunications, but also in fixed telecommunications and broadcasting;
- complementing this commercial market opening with a least-subsidy tendering process to provide networks in areas that do not get served on a commercial basis;
- enabling entrepreneurs to resell network services to the public.

⁴³ Details will be available in due course in the final project report.

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7.2.3 Roles

The proposals of this sub-project are mainly addressed to organs of Nepalese government and the international donor community. However, the overall approach is an enabling one, with the aim of creating an environment in which private enterprise and community initiative can flourish. The thrust is to make it possible for communities themselves to recognise when they need ICTs, and for their stated needs to be fulfilled. The main roles of government here are to:

- carry out required policy and legal reforms
- stimulate provision of network infrastructure to reach all parts of the country within the next 5 to 8 years.

Working together, government and NGOs will:

- channel funds and expertise to help communities realise their own development goals
- sponsor pilot project activities and the rapid dissemination of the lessons learned from them
- promote the sharing of information on electronic ICT-related activities among all parties involved
- provide content for both broadcast and Internet applications.

The private sector will take up the business opportunities that are opened for it. These may be extended by offering extra support to make marginal cases profitable (for example, start-up funding for rural shared telephones).

Figure 12 illustrates how different people are involved in the different types of action arising from this sub-project. As commented earlier, as a telecoms policy project, our focus is on the lower layers. Of course, all layers are important.

Layer	Description	Bodies involved
Content creation	Radio and television programmes, Internet content	Broadcasters, various donors and NGOs, HMG bodies
Rural shared access, distribution	Shared phones, telecentres, cyber cafés, schools	Owners of phones, telecentres, NGOs, operators, local government
Infrastructure	Telephone services, broadcasting, newspapers	Telecom operators, nationwide broadcasters, community radio, media houses

Figure 12 Types of action and roles

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In section 7.3 we reproduce for convenience the proposals made in section 6. Annex C lists various ideas which do not appear as proposals but which may be of interest. Figure 14 to Figure 18 below provide an overview of the proposals, with subjective indications of their importance, urgency and difficulty leading to a rough priority classification.

	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	The rural-urban dimension						
A1	Survey and map ICT facilities	NITC, Districts	Planning	High	High	Low	High
A2	Multipurpose telecentres in 150 rural market centres by 2005	MHUD	Infrastructure	High	High	High	High
A3	Low interest loans to encourage ICT businesses	MOF	Access	Medium	Medium	Medium	Medium
A4	Reasonable rates for phonecalls to Internet	NTA, NTC	Access	High	High	Medium	High

Figure 13 The proposals (1)

	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	Development project co-ordination						
B1	Framework paper for ICT development	NPC	Planning	Medium	Medium	Low	Medium
B2	Build NITC strength as focal point	MOST, donors	Planning	High	High	Medium	High
B3	E-mail list for information sharing; guidelines	NITC	Planning	High	High	Low	High
B4	Fit telecentre plans with rural electrification and telecom network roll-out	NITC	Planning	High	Medium	Medium	Medium
B5	Library of local content	NITC	Content	High	Low	Low	Low
B6	Database of projects using electronic ICTs	NITC, donors	Planning	High	Medium	Medium	Medium
B7	District ICT co-ordination committees	Districts, LGP, PDDP	Planning	Medium	Medium	Medium	Medium

Figure 14 The proposals (2)

	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	District roll-out programmes						
C1	District periodic plans for ICTs	Districts, LGP, PDDP	Planning	High	Medium	High	High
C2	Briefing materials for Districts on ICTs	LGP, PDDP, RUPP	Support	Medium	Medium	Low	Medium
C3	Guidance to Districts on ICT plans	LGP, PDDP, RUPP	Support	Medium	Medium	Low	Low
C4	Awareness campaigns in Districts	Districts	Support	Medium	Low	Low	Low
C5	Training for telecentre staff	NITC	Support	High	Medium	Low	Medium
C6	Funding to favour disadvantaged	MLD, donors	Support	Medium	Medium	Medium	Medium

Figure 15 The proposals (3)

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	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	E-government applications and multipurpose telecentres						
D1	Government on Internet by 2004	HMG, NITC	Access	High	High	Medium	High
D2	Officials use e-mail by 2005	HMG, NITC	Access	High	High	High	High
D3	Long-term plan for e-transactions	NITC	Planning	Medium	Low	Medium	Low
D4	Review rural telecentre plans	NITC	Infrastructure	High	Medium	Medium	Medium

Figure 16 The proposals (4)

	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	Broadcasting						
E1	Universal radio access by 2007	MOIC, donors	Infrastructure	High	High	Medium	High
E2	Encourage community radio	MOIC	Infrastructure	Medium	High	Low	High
E3	Universal TV access by 2007	MOIC, donors	Infrastructure	High	High	Medium	High
E4	Educational broadcasting	MOES, donors	Content, access	High	High	Medium	High

Figure 17 The proposals (5)

	Proposal	Lead role	Type	Importance	Urgency	Difficulty	Priority
	Postal and telecommunications services						
F1	Encourage and complement private enterprise	MOIC	Planning	High	High	Medium	High
F2	Share scarce connections in Districts	HMG, NGOs	Infrastructure	Medium	Low	Medium	Low
F3	Accelerate e-post and EFT	MOIC	Access	High	High	High	High

Figure 18 The proposals (6)

7.3 List of detailed proposals

7.3.1 The rural-urban dimension

- A1 By the end of 2003, NITC should carry out and publish its planned national survey of telephone, computer, and Internet facilities. The findings should be provided to the GIS centres for inclusion in their resource maps. From now on, all Districts supplying bottom-up data should be asked to include data on both private and publicly available facilities such as radio, television, telephone, fax, computer and Internet. These data should be used to update the NITC survey results as well as the GIS database.
- A2 The Ministry of Housing and Urban Development has a plan for fast-track development of selected rural market towns. Actual or potential public access to telephone and Internet should be a factor in the selection process and also a facility to be provided in these towns. An achievable target should be set, such as that public Internet access should be available in 150 rural market centres by the end of 2005.

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- A3 Any obstacles to private enterprise providing publicly accessible ICT facilities on a commercial basis should be removed (e.g. no permits should be required). Consider positive incentives, such as low-interest loans to enable under-employed young people to buy necessary equipment (e.g. telephones, fax machines or computers).
- A4 Telephone tariffs charged for Internet access should be at reasonable rates. The current per-minute rates for long-distance access (needed where there is no local Internet point of presence) are not reasonable.

7.3.2 Development project co-ordination

- B1 In order to provide a clear framework for relevant activities, the National Planning Commission should add a paper on ICTs for development (including, specifically, rural development) to its series of e-consultation papers⁴⁴, and keep this updated in the light of comments received. This should cover the full range of ICTs, both traditional and electronic.
- B2 Under a single Ministry with overall responsibility for all electronic ICT infrastructure and access, the strength and capabilities of the National Information Technology Centre (NITC) should be built up to enable it to become the focal point for co-ordination, planning and support for all development projects using electronic ICTs. It will encourage outside investment in electronic ICT projects.
- B3 By the end of 2003, NITC should set up an open bulletin board and/or e-mail list for sharing of news about electronic ICT developments in Nepal among all interested parties. Based on growing experience of rural multipurpose telecentres, NITC will publish and keep updated guidelines on how to run these, including what equipment, staff and facilities are needed, locations and opening hours, and charging policies.
- B4 NITC will ensure co-ordination of the rural multipurpose telecentre programme with the rural electrification programme and with the rollout of fixed and mobile telephone networks.
- B5 NITC will also run a library of locally appropriate content, which can be made available in different formats as required (e.g. on CD-ROM as well as over the Internet, enabling stand-alone computers to use the material).
- B6 The development community should sponsor an online searchable database of current and planned development projects. Each project record should include details of resources used as well as the basic project data (aims, funding, timescales, Districts covered, contacts) already sought for the UNDP inventories, and the date of last update. NITC seems a natural place to host the database.

⁴⁴ <http://www.ndf2002.gov.np/consult.html> Existing sectoral papers cover agriculture, water, education, electricity, health, irrigation, roads, and construction; issues papers cover reform of governance, finance, and state-owned enterprise as well as decentralisation, private sector and rural development, and civil society partnership.

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- B7 Within each District, an ICT co-ordination committee should be set up including representatives of the VDCs, line agencies of government, any NGOs active in the area, private entrepreneurs and any other interested parties. The Co-ordination Committee should be responsible for liaison both within the District and with the centre (Ministry of Information and Communication and other concerned Ministries), with the aim of ensuring both appropriate local ICT provision and the fullest possible use of what is provided

7.3.3 District roll-out programmes

- C1 Working through LGP, PDDP and/or similar channels (as available), each District in Nepal should consider ICTs as part of their regular overall development proposals, and include what ICT services, equipment and skills they think appropriate in their periodic plans and bid for funds.
- C2 The LGP and PDDP should jointly produce simple briefing material for Districts (such as illustrated booklets and/or videotapes), suitable for distribution to anyone interested, which explains in local language the applications of different electronic ICTs, and includes real-life examples of how people in other Districts are benefiting from them.
- C3 LGP, PDDP and RUPP should jointly produce guidance for senior District personnel on what electronic ICTs are most likely to be beneficial in what conditions (e.g. a computer with CD-ROM drive could be very valuable in a secondary school before a telephone connection permits Internet access, but should only be provided if there is a member of staff competent to supervise its use).
- C4 When electronic ICTs first arrive in a place, an awareness campaign should be mounted to ensure that local people understand what is now available and how they can benefit from it. Campaign materials suitable for everyone (such as posters or radio broadcasts) should be supplied centrally. Especially in the early days of roll-out, ensure that the campaigns reach all those who may use the facilities, bearing in mind that they may live quite far away, even in a different District.
- C5 Training should be provided for telecentre staff (including benefits of telephone usage and “Internet scribe” skills where needed). These people may overlap with “community IT-mobilisers”.
- C6 HMG and the development community should especially support funding bids from community-based organisations with high membership among the most disadvantaged groups (e.g. Dalits and women). Consideration should be given to adjusting the ratios for matched funding in order to favour these groups.

7.3.4 E-government applications and multipurpose telecentres

- D1 In 2003, connect all Departments of central Government to the Internet. By the end of year 2004, all government departments should establish informative websites,

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which are regularly updated and make available all main documents published, with contact telephone numbers.

- D2 By the end of year 2005, in those Departments with responsibilities for service delivery to end-users (e.g. Agriculture, Health, Education, Post), all staff whose jobs require completion of secondary education (or above) will be Internet- and e-mail-literate and will use e-mail for internal and external communications. This is necessary both to provide open Government, and to facilitate the use of Internet and e-mail by rural development projects. Websites should include e-mail addresses for relevant government officials, and facilities for feedback or forum discussions.
- D3 The NITC should devise a longer-term plan for introducing interactive e-governance applications, where the procedures to be automated have been simplified as far as possible.
- D4 NITC should proceed with the early part of its pilot multipurpose telecentre programme (up to 15 centres), ensuring that the experience gained is widely shared. The later part of the programme should be reviewed within two years in the light of early experience, community demand and other developments. The programme should be co-ordinated with the Ministry of Information and Communications, as it is planned that the mobile tender will include public Internet access (at two sites per mobile base station), and with other agencies piloting multipurpose telecentres (examples are given in Annex A).

7.3.5 Broadcasting

- E1 MOIC (with donor support if necessary) should ensure adequate broadcast radio signal reception everywhere, and at least one working radio receiver in each settlement, by 2007. Satellite radio should be used where necessary to reach people who live out of range of terrestrial broadcasts.
- E2 Community radio has already proved its worth in Nepal and should be given every support, including the grant of wireless licences to organs of local government with minimum cost and difficulty. All independent radio and television channels should be prepared to carry some agreed public service programming. As Internet access becomes available, co-siting community radio stations and Internet access points will lead to useful synergies.
- E3 Universal television signal coverage of Nepal's population should also be a target for 2007 (using satellite reception only where necessary, and ensuring adequate quality signal). Community television receivers should be available everywhere with existing signal coverage by the end of 2005.
- E4 Consider provision of individual audio cassette recorders to help trainee teachers to listen to all their radio broadcast lessons. Next priorities for electronic ICTs in education are television programmes for trainee teachers (along with adequate access to television sets for all trainees), the provision of radios and televisions to schools

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and schools programming. Support the Distance Education Centre's plans for developing its services.

7.3.6 Postal and telecommunications services

- F1 There should be no barriers to the provision of services such as public access telephones, message bureaux (which handle messages on behalf of people without direct access) and cybercafes, and these are likely to grow on a commercial basis following the availability of infrastructure. Additional needs should be identified and fulfilled using the bottom-up framework described above.
- F2 All organisations (HMG or NGO) that get their own phones or Internet access in rural areas should be willing to share these facilities on reasonable terms with other organisations and the general public, for as long as there is an access shortage.
- F3 There should be a plan to provide e-post and secure electronic funds transmission at all Post Offices in places where power supply and telephone connection are available, and where premises are suitable. Following a pilot project to identify and resolve practical problems, all Post Offices that already satisfy these criteria should provide these services by 2005. After that, other Post Offices should be connected progressively to the e-post network when power supply and telephone connections arrive nearby. In some cases, e-post may justify special provision of these services to remote areas. Public-private partnerships should be seriously considered.

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Annex A RELEVANT ACTIVITIES IN NEPAL

Ministry of Science and Technology

A pilot project to install 15 rural multipurpose telecentres in 15 different VDCs in 9 Districts is already under way, under the joint management of the Ministry of Science and Technology's NITC (National Information Technology Centre) and the UNDP-funded ICTs for Development programme. The first two telecentres, in Sunsari District (OCID index rank 61)⁴⁵, will soon go live. An orientation day was held on 6 May 2003 for people involved in the telecentres at the local level. Each telecentre will provide telephony and Internet access, plus specialised local content which is being developed for the purpose. Ultimately the plan is to extend to 1500 such sponsored telecentres, with Japanese support for 1475 of these (see below).

A tender is being placed for Nepalese website content for the telecentres, covering health, environment, agriculture etc. There will be at least one e-government application in each telecentre e.g. applications for passports or citizenship certificates. Translation into local languages will be done locally. Each telecentre will have two computers and one phonenumber, plus an Uninterruptible Power Supply, a printer, a scanner and a webcam. Each will initially have three fulltime staff - a manager, a technician and a community mobiliser - though this staffing level will reduce as the centres become established.

It is recognised that sustainability is an issue. Initially no charges will be made for services, but later, charges will be introduced that reflect the savings made by users (e.g. avoiding a trip to town). Charges may be differentiated so that poorer users pay less. Internet telephony should be permitted and this would boost revenues. It is hoped that the pilot project will lead to private sector copying of the model.

An associated current proposal, awaiting approval, is for Japanese support for NTC to install pilot multipurpose community telecentres in 10 VDCs in the Kathmandu Valley, each 2-3 hours' drive from Kathmandu (OCID index rank 75) and with populations over 4,000. The purpose is to develop a sustainable model for multipurpose community telecentres, trying out different approaches to charging and comparing them with simple public call offices. The pilot project is to be carried out in conjunction with the Ministry of Science and Technology. Each telecentre will have two phones, one computer with modem, a fax machine, printer and uninterruptible power supply.

Rural-Urban Partnership Programme⁴⁶

RUPP has initiated e-governance for the first time in Nepal at the municipal level in Bharatpur and Hetauda municipalities. RUPP has also initiated Business to Business e-Commerce (B2B e-commerce) in seven municipalities (Pokhara, Byas, Tansen, Bharatpur, Butwal, Hetauda and Tulsipur) in collaboration with local Chambers of Commerce and Industry.

⁴⁵ OCID means the Overall Composite Index of Development for Districts. The information is taken from *Districts of Nepal – indicators of development*, ICIMOD, 1997. In this ranking, 1 is worst and 75 is best.

⁴⁶ Information in this section mainly supplied by Suresh Dhoj Shrestha of RUPP and Roger Harris.

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UN-HABITAT is working with RUPP on a project "Assessing the Feasibility of ICT as a Development Instrument for Rural-Urban Linkages in Nepal" which will establish around 17 rural and peri-urban telecentres. The purpose is to produce a proven set of operational modalities, procedures and techniques with some successful model examples of the beneficial results of ICT in development. Specifically, the project is to report on the use of ICT as an instrument for facilitating and promoting social and economic development with a particular focus on the poor and on women through an assessment of the use of e-governance and e-commerce in a rural-urban setting. Four rural telecentres have already been set up under this programme in 4 Rural Market Centres - Bhimphedi, Khaireni, Kohalpur and Rangeli.

AgriPriceNepal.com is a pioneer Nepali website on agricultural market information for Nepal, jointly hosted by the Rural-Urban Partnership Programme, the Agro Enterprise Centre and the Federation of Nepalese Chambers of Commerce and Industry. Subscribers can get latest price and source information for more than 150 agricultural commodities in 18 major markets of Nepal.

Participatory District Development Programme⁴⁷

The UNDP-funded PDDP (Participatory District Development Programme - <http://www.pddp.org.np/>) has established District Information and Documentation Centres (DIDC) at 30 western districts as envisaged by the Local Self Governance Act (LSGA). Later the LGP (<http://www.lgp.org.np/>), another UNDP funded programme, replicated the model in another 30 districts in eastern Nepal.

PDDP has established a trickle-up information chain with desktop GIS facility for the first time in Nepal to collect, process, and utilise value added products in planning activities. As part of the LSGA, each DDC has prepared resource maps by plotting and updating service/infrastructure locations on standard large-scale maps. These spatial maps with socio-economic information collected by the DDC were further analysed for sectoral planning activities. Poverty and Resource Mapping Reports of concerned districts are end products of this exercise.

PDDP has conducted feasibility studies and prepared action plans for two districts (Kanchanpur and Tanahun) on Implementation of ICTs for e-Governance. To implement the recommendations of this study, PDDP has planned to establish Rural Information Centres (RIC) in two VDCs, that will be operated by existing community-based organisations (not yet decided).

Kanchanpur district, with technical support from PDDP and other donors, has established computer networks to all VDCs and connected to DDC central information. DDC Kanchanpur with private company collaboration has also established VSAT at district level. With the help of this technology, Kanchanpur and surrounding districts are now able to get services of telecommunication including Internet facilities.

⁴⁷ Information in this section mainly supplied by N K Shrestha of the PDDP GIS service.

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With technical support from National Planning Commission GIS Facility/PDDP, some fast tracking districts launched their websites and created multi-media CD-ROM to disseminate all relevant information digitally. DDCs have archived all related documents, such as Periodic/annual plans, transport master plan, tourism plan, profile, etc in one CD-ROM.

Some PDDP supported districts also used the ‘DDC Accounting and Financial Management Package’ to computerise their daily book-keeping work for financial transparency as envisaged by LSGA.

For the first time PDDP has mapped and selected deprived VDCs for implementing development programmes in needy areas. A conflict mapping report “Identification of Exclusion in PDDP supported districts” was prepared as a tool for targeting development programmes towards excluded communities. The composite priority index of each VDC was calculated for all PDDP supported districts on the basis of degree of prevailing development conflict (as stated by DDC), human poverty index, deprived caste index, and physical isolation index.

Ministry of Agriculture and Co-operatives

86% of Nepal’s population depends on agriculture, which accounts for 40% of GDP. Livestock and horticulture are included. The strategy is to move from subsistence towards commercialised agriculture. ICTs are very important in implementing this strategy. Farmers need two main types of help:

- In raising crops – advice is needed on new varieties and techniques (for example, pest control). This advice has to be tailored to local conditions
- In marketing and selling their produce. Markets for cash crops must be identified. Current price information changes fast, and can be vital to decisions such as when to harvest.

The farmers who are open to change tend to be younger and better educated than average, so it is realistic to reach them using written leaflets. The Ministry is planning to make information available on CD-ROMs and videotape where reading devices are available (e.g. at Headquarters, and increasingly in the Regional Centres) and would like to use the Internet as this becomes practical. They feel that the buildings which house markets in many towns would be ideal locations for shared Internet access points.

For the time being, the main way of reaching a large audience is daily national 15-minute radio programmes broadcast in the early evening. These are supplemented by national television programmes, and by some regional and local radio programmes (sometimes in local languages).

VDC Listeners’ Clubs have been formed to enter competitions. Quizzes with modest cash prizes have generated a lot of interest.

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Ministry of Health

The Ministry has a computerised facility for processing statistics collected from local health workers and producing various high-level reports and graphics. Ward-level health volunteers complete simple forms which require very low literacy.

Some District Health Offices and most hospitals have a computer. These are generally used for internal management purposes such as accounts. It might be realistic to think about collecting statistics electronically in 10 years' time.

There is a systematic approach to using a variety of channels for health messages to the public. The single most important channel is personal contact with health workers. Printed leaflets and posters are a useful supplement. Radio and television broadcasts are increasingly being used too. They are working towards a community television in each VDC. Another plan is to provide a vehicle per District equipped with communications devices, which would tour the villages.

Ministry of Education and Sports

The current top priority is training 47,000 untrained primary teachers (around half the workforce) who are educated to School Leaving Certificate level only. Half-hour radio broadcasts 6 days a week are an important element of the 10-month course. On Saturdays, group sessions (each of about 25 teachers) are held at the teacher training Resource Centres – 400 of these already exist, out of a planned total of 1,331. Here televisions are provided and audio cassette players, which permit trainees to catch up on radio lessons that they may have missed. Many trainees would prefer the radio lessons (now 5.30pm to 6pm) to take place a couple of hours later.

Classroom materials including radio broadcasts have been developed for Grade 3 Maths and Grade 5 English. These aim to benefit both trainee teachers and their pupils at the same time. Assessments show significant improvements in pupils' achievements when these materials have been used.

The Distance Education Centre and National Educational Development Centre have a range of plans which could make good use of ICTs, mainly radio and television. For example, they would like to produce outreach programmes for children who for various reasons (primarily poverty or distance) are not attending school.

An Open University for Nepal using the full range of ICTs is still on the drawing board.

Broadcasting

Two community radio stations have been established for a few years already: Radio Lumbini in Manigram in western Nepal and Radio Madan Pokhara in Palpa District (OCID index rank 54)⁴⁸. They are supported by the private firm Media Services International. A precursor was Radio Sagarmatha, which broadcasts in Kathmandu. One licence is held by

⁴⁸ Nepal Country Strategic Paper for the World Association of Community Radio Broadcasters, Bharat Koirala, February 2002 (online at <http://www.amarc.org/amarc/ang/>)

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the VDC and the other by a community group. The service has proved very popular. Ownership of radio receivers in the coverage area has increased dramatically (shown as 68% in the census). Programmes can include valuable development messages, such as AIDS awareness and prevention. New FM licences have recently been announced for local stations in Karnali and Bhaktapur.

Some 22 PDDP supported districts (some 38 VDP VDCs) are benefiting from Satellite Radio sets. The communities are now able to receive information and broadcast their programmes digitally. PDDP has purchased 40 receiver sets and antennas from Equal Access, and distributed them among the remote communities of VDP VDCs. The receivers were established at places that are easily accessible for a large group of community members to gather together to listen to development programmes. Eight VDCs of Kanchanpur district are developing their own programmes to broadcast through this technology.

The Departments of Health and Agriculture both broadcast regular short radio programmes in Nepali (typically 15 to 20 minutes in the early evening) containing important preventative health messages and information for farmers, respectively. These are said to be very popular. Educational broadcasting at present focuses on daily lessons for primary teacher training.

Miscellaneous

The Postal Department is planning to modernise counter service and provide e-post at 18 of its 4,000 post offices in the next 5 years.

A current Worldlink initiative is for distance learning in Namche, a Sherpa community near Everest which has become relatively prosperous from tourism. Most educated Sherpas have left the area. There are plans for a Sherpa lady in the USA to provide lessons over the Internet to people in Namche. Moving picture quality is expected to be acceptable with the 128kbps connection to be provided.

The government's Geo-information and Records Department has furnished the Kaski (Pokhara) Revenue Office with six computers in order to document land records as an experiment. The system makes land records less vulnerable to tampering, damage and destruction than their paper predecessors and mistakes in recording have been reduced significantly, according to the operators. A system user was quoted as saying that the computer has revolutionised the work by reducing the time taken from an hour to a minute.

The medical network HealthNet provides online access for doctors and nurses to international health databases and Nepalese health information. A fibre Local Area Network connects more than 70 terminals on and near the Tribhuvan University Teaching Hospital campus, providing direct access for on-site staff. Distant doctors can access HealthNet using a secure dial-up method (their subscription also covers general Internet access). HealthNet provides week-long training for doctors who are not yet familiar with computers, the Internet and search methods.

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A limited telemedicine pilot project is in an early stage, in association with HealthNet. As it requires expensive equipment (cameras etc) it is unlikely to become widespread in rural Nepal in the foreseeable future. For the time being, the emphasis must remain on preventative rather than curative medicine (which is much more cost-effective).

A DFID/HMG-supported District Treasury Control project has linked computers in 64 Districts and major municipalities to central government. This has made cash management faster and more transparent.

The NepalNet website⁴⁹ established by ICIMOD in 2000 as part of its Electronic Networking Project contains much useful development information and links, although some of this is now aging.

⁴⁹See <http://www.icimod.org.np/focus/ict/enp.htm#ictpol> and <http://www.panasia.org.sg/nepalnet>

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Annex B INTERNATIONAL LITERATURE REVIEW

World Bank

A World Bank infrastructure economist⁵⁰, 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 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.

⁵⁰ Charles Kenny, in *The Costs and Benefits of ICTs for Direct Poverty Alleviation*, draft, 33 pages, January 2002.

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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 Asia⁵¹ 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.

⁵¹ *Information Society and Development: Review, Asia Final Report*, by Paul R Watson, 2000, 194 pages

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Asian Development Bank⁵²

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 Development⁵³

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.

⁵² *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

⁵³ *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 report⁵⁴ 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 "cabins" (public Internet access points) showed that some cabina users are poor, but they were relatively well-educated (often, students). Therefore, the cabins 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.

⁵⁴ *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 to ask for a copy.

<http://www.developmentgateway.org/node/133831/>
http://www.itu.int/wsis/documents/background.asp?lang=en&c_type=dt
<http://www.cominit.com/materials.html>
http://network.idrc.ca/ev.php?URL_ID=25549&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1055243289

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Annex C IDEAS

Store on CD-ROM any Internet-type content which does not change rapidly, and make it available for off-line use. Similar remarks apply to forms etc for e-governance applications.

Set up web-based facilities to help Nepalis abroad communicate with home as mobile phone coverage and takeup expands, and Internet use spreads. For example:

- A facility to send text messages from a website to known mobile numbers in Nepal already exists⁵⁵.
- This could be even more useful with a directory of numbers of shared mobile phones in villages, as these become available.
- A bulletin board for sending messages to and from Nepalis away from home, organised by village, could reach people by word of mouth even if they have no personal Internet access.

Exploit technical advances making Internet more easily and widely available, such as:

- Voice enquiry services, providing indirect Internet access to anyone with a phone (Nepal's Ask Me Club is similar, and the WorldTalk service mentioned in 6.6 is an automated version).
- Software is now available⁵⁶ that speeds up Internet access by stripping out graphics, simplifying the format of web pages and compressing the text so that web page download times are reduced.
- Another useful feature offered by some websites is that documents can be requested as e-mail attachments as an alternative to being downloaded, and search engines may offer a similar option for web pages identified as of interest.
- Methods are being developed for both increasing the reliability of computer networks and streamlining downloads by multiple linking of computers, sharing caches and saving webpage requests for future online sessions⁵⁷.

Use all appropriate technologies to provide communications networks, including telephone/Internet over cable television infrastructure, Wireless Local Loop, WiFi.

⁵⁵ Provided by ITNTI at www.nepalonline.com

⁵⁶ For example, the Aidbase software illustrated at <http://www.aidworld.org/demo.html>.

⁵⁷ *Reliable Networks in an Unreliable Network Environment*, ESD.127, Telecom Modeling and Policy Analysis Project Report, Massachusetts Institute of Technology, May 6, 2002. Authors Ezequiel Hart, Diego Puppini, Atsumasa Sakai, Mark Sin. This project is helping to plan a network of computers in schools in Bhutan. The news item at <http://news.bbc.co.uk/1/hi/technology/3065063.stm> gives another angle on the contents.

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Aim to produce broadcast programmes which entertain at the same time as delivering serious development messages. The Listeners Club competitions held by the Department of Agriculture are a good example. Promote own-language subtitling to enhance literacy.

As mobile phone coverage expands, postmen and itinerant vendors could carry mobile phones and become “walking public call offices”. Offering shared telephone service can also be a good small business opportunity for people with less mobility and limited earning options (e.g. disabled people, village women, Dalits).

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Annex D ILLUSTRATIVE DISTRICT MAPS

(maps removed to reduce file size – available separately on request)