“Breathing the thin air of cyberspace”: Global knowledge and the Nepal context *

Jon Gregson a and Gaurab Raj Upadhaya b

a Electronic Networking Project, International Centre for Integrated Mountain Development (ICIMOD), GPO Box 3226, Kathmandu, Nepal
E-mail: jgregson@lineone.net
b United Mission to Nepal (UMN), GPO Box 126, Kathmandu, Nepal
E-mail: gaurab@geocities.com

Abstract. This article examines global and indigenous knowledge sharing with a focus on electronic information exchange in Nepal’s development sector. Drawing on lessons from experience based on two local examples, a framework is presented of a strategy for realising the potential of Information and Communications Technology (ICT) in countries where knowledge sharing and access is constrained in a variety of ways.

The “iCAPACITY framework” outlined for the South Asian context integrates the inter-dependent themes of Content, Access, and Partnership, highlighting the critical components that require consideration when building the capacity for ICT usage and knowledge sharing in a developing country context. Practical initial steps are put forward, that recognise the primary concern for holistically addressing economic, social and environmental issues, with the overall priority of alleviating poverty using broad-based participation.

The paper concludes that developing countries such as Nepal, currently occupy what may be metaphorically referred to as “the thin air of cyberspace”, where the essential knowledge needing to be shared locally or globally is not yet widely available or accessible. In this context, particular care has to be taken in formulating localised strategies and models that can improve the quality of this “air”, and lead to a situation where development efforts can truly be enhanced by the IT revolution.

1. Introduction

In recent years, much has been written about the Internet and other Information and Communication Technologies (ICTs), and there is a growing debate regarding the contribution that these new technologies are making in developing countries.

ICTs have emerged as powerful tools that are instrumental, and many would now claim essential, in the task of creating new knowledge and powerful knowledge sharing networks.

The term “Knowledge” is used frequently in this paper, and in the context of social development there is much disagreement over precisely what constitutes knowledge. Many papers and books have been published on this subject by scientists, sociologists, and political economists, and the topic is beyond the scope of this article. For the purpose of this article knowledge refers specifically to explicit or codified knowledge that exists or has been published on non-digitised media, but which could be digitally stored. In the many years that developmental organisations have been active in Nepal, a huge amount of money and resources have been poured into research and fact finding missions. If access to these resources alone

* This article has been adapted from a paper originally presented at the Towards a South Asian Knowledge Network (TASKNET) ’99 Conference on Global Knowledge for South Asia, held at Vigyan Bhawan, New Delhi, 23–24 November 1999. The views and opinions expressed in this article are those of the authors, and do not necessarily represent those of the organisations with whom they are affiliated.
was simplified, it is suggested that the quality of knowledge sharing networks within the country would rise significantly.

In the context of the debate over the impact of ICTs and the claims being made, this paper, as advocated by Heeks [5], sets out to provide analysis and a review of the usefulness of ICTs in two recent projects in Nepal which were designed to develop and enhance knowledge sharing networks. The paper seeks also to identify what needs to be done in Nepal for creation of better knowledge sharing networks.

The paper also briefly refers to conceptual models being proposed by different authors for assessing ICT projects. For a variety of reasons none of these proved to be ideally suited to the current analysis. The authors have therefore put forward a tentative framework referred to as the iCAPACITY framework, which integrates the three main themes of content, access and partnership, together with the sub-themes which emerged from the study of ICT projects and capacity in Nepal. It is the hope of the authors that in the future this tentative framework can be further refined and adapted as a qualitative tool for use within other less developed country (LDC) contexts.

2. An overview of ICT potential and utilisation in Nepal

Nepal is often portrayed as one of the poorest countries of the world. However it is also one of the most diverse, and it is undoubtedly rich in its potential for information and knowledge sharing both internally, within South Asia, and globally.

There are over fifty ethnic groups inhabiting terrain ranging from just above sea-level to the highest peaks of the world. Aside from commercial ventures, there is much that could be shared internationally from the cultural heritage, lifestyles and local indigenous knowledge of the people of Nepal, and from the considerable amount of research undertaken in Nepal over the last forty years.

The huge contrasts in topography, livelihoods and income between those living in urban and rural areas, present development practitioners, policymakers and politicians with immense challenges. Historically planners were further constrained by the fact that Nepal is geographically landlocked between its two neighbouring global giants, China and India. Nepal was reliant on the goodwill of these countries, in order to gain access to trade routes and ports for export and import of key resources. The advent of information- and knowledge-based service industries not constrained by geographical borders is therefore of great strategic significance and potential for Nepal’s economy as a whole. These new industries rely primarily on human capital and know-how and can be marketed and distributed across the fast growing global telecommunication networks.

The development scenario in Nepal is further complicated by rapid growth in the numbers of Non-Governmental Organisations (NGOs), involvement of a wide range of international organisations, and changing roles of the State and Private Sector as a result of structural adjustment and liberalisation of the economy. There is also a need to give a voice to poor people and those living in rural areas.

In the face of rapid change and many stakeholders, it is clear that the generation and timely sharing of good quality information is an essential pre-requisite for sustainable livelihood development.

In this context Information and Communications Technology (ICT) tools are being increasingly seen as providing potential solutions for promoting sharing of knowledge and learning. The Internet in particular has had an enthusiastic reception in the country. It has promoted interaction by removing some of the constraints of physical “international” borders, and promises changes in the rules and steps of development, along with a potentially huge leap to previously unimagined levels of access to global knowledge.
However since the arrival of Internet access in Nepal in 1995, the impact in the development sector and for the country as a whole has been limited. The need for better global knowledge access and information sharing is undeniable, the motivation increasingly evident, but the constraints on effective, efficient and larger scale usage of ICT as a development tool for use within and across Nepal’s borders remains considerable.

This paper explores some of the early steps taken in using ICT in Nepal. Drawing from these experiences a framework appropriate for developing capacity, and effective use of ICT for knowledge sharing in less developed countries is described.

3. Examples of ICT initiatives from Nepal

In developing countries, effective ICT initiatives are few and far between. This is not surprising owing to the low level of technical know-how that exists in these countries. In Nepal, ICT initiatives were evident as early as 1971, when use of computers was introduced in population census calculations. The first programme that was targeted specifically towards information networking and knowledge sharing was the UNESCO backing for use of the CDS-ISIS database software for librarians, which is now extensively used particularly by National-level NGOs and National libraries and research institutions. The Royal Nepal Academy of Science and Technology (RONAST) supported networking projects and the Health-Net project supported by Boston based Satellife are both examples of significant pioneering efforts.

Since 1995, NGOs, Bilateral and Multi-lateral agencies and Government departments have all started to consider how ICT can be effectively harnessed to the development needs of the country. This has resulted in initiatives emerging in diverse areas such as telecommunications infrastructure, governance and improved delivery of basic services including health and education. The potential of ICTs has started to be recognised, and in particular the need for a National Information Infrastructure and clear ICT policies that co-ordinate and prioritise activities is now being addressed through a process of National ICT Strategy and Policy development.

This article focuses on two recent projects which commenced in response to the advent of the Internet in Nepal, and which sought to create sustainable knowledge networks among organisations working in the development sector.

3.1. NepalNet: sharing knowledge for sustainable development

NepalNet is a collaborative initiative to produce an on-line web-site, involving sharing of research from thirty four development agencies. It was initiated by the Electronic Networking Project (ENP) of the International Centre for Integrated Mountain Development (ICIMOD) in 1997. It is hosted on the Internet on the Pan Asia server, where it represents part of the larger knowledge sharing network that is supported by the International Development Research Centre (IDRC), Canada. NepalNet can be accessed on the Internet at www.panasia.org.sg/nepalnet.

Agencies involved were carefully selected, and comprise mainly Non Governmental Organisations (NGOs), but Government Organisations and Educational Institutions are also involved. Awareness was raised through provision of Internet access, and web-site design capabilities were built up within all the partner organisations. From the start it has been a co-operative effort involving a network of organisations. The NepalNet web-site has links to partner homepages, and has a core area where a wealth of information relating to nine key development sectors is accessible. The nine key development sectors are:
Agriculture; Ecology and Biodiversity; Education; Economics and Employment; Forestry; Sociology and Demography; Politics and Law; Technology and Infrastructure; and Water, Earth and Atmosphere.

NepalNet is currently in the process of being handed over to the Nepal Internet Users Group (NIUG), who will continue to provide local co-ordination and support to the partners, and extend involvement to new partners including International NGOs. This transfer is seen as an essential step towards establishing a sustainable future for this knowledge sharing initiative.

3.2. Indreni: The Nepali Intranet

Indreni, an Intranet-based local information service initiated in 1998, with the support of ICIMOD, and run by a membership based NGO called Nepal Internet Users Group (NIUG). It has been developed largely by volunteer initiative, and is instrumental in creating awareness and provision for information access in the Kathmandu Valley. There is a focus on supplying information that is relevant to the country, at much lower cost than would be the case if users accessed the same information on the Internet.

There are as yet unrealised plans, to extend the Intranet to district level, and promote local language content development and local knowledge sharing. These plans would require development of suitable software to facilitate local language information searching, and possibly a form of local e-commerce. Possibilities for future development, also include the potential for working in partnership with community radio, in areas where commercial Internet Service Providers (ISPs) may lack incentive to operate.

4. Conceptual models for assessing ICT

It is beyond the scope of this article to provide detailed insights into conceptual models for assessing ICT, and the reader is referred to the article by Daly [1] which provides a useful overview of the ICT frameworks referred to below.

In presenting an assessment of Nepal’s ICT capacity, reference to a framework was considered desirable by the authors, in order to provide some structure for the analysis that follows. The frameworks described by Daly [1] were therefore considered, but were found to be diverse in application and usefulness, and they can be classified in different ways. Some are oriented to the communication process (e.g., transmission deficit models), some are particularly suited to analysis and comparison of ICT projects, some are oriented towards evaluation of organisation or business enterprise impacts, and others seek to integrate indicators for assessing Sector- or National-level ICT capacity and informing policy.

For the purpose of the current article, a framework was sought which would take into account both local, national, and global dimensions of knowledge networking and ICT capacity. This requirement narrows down the choice of options available.

Two footprint based frameworks of interest for assessing National ICT capacity are (i) the “footprint” developed by Larry Press et al., which has been used for national level assessments and is suited to assessing capacity, identifying “Internet success determinants” and informing policy makers; and (ii) the approach taken by Mansell and Wehn [7] to indicate levels of participation in knowledge societies. However, both these models require access to data that is not available in a less developed country such as Nepal, and therefore a more descriptive approach was needed.

The Pimienta Model and Daly’s own conceptual framework for understanding Internet impact, both provide useful options that give scope for qualitative assessment. However, in order to closely match the

1 Indreni is the Nepali word meaning rainbow.
ICT capacity themes of “Content, Access and Partnership” which were the focus for the TASKNET ’99 conference (where the original draft of this article was first presented), the authors decided to develop their own tentative framework as a reference point for this article, and this is shown in Fig. 1.

5. Content, Access and Partnership

Under the three themes of content, access and partnership, each of which occupy two segments of the iCAPACITY framework, the local and global dimensions of relevance to ICT usage in Nepal are now introduced, using the metaphor of breathing in and out. This is indicated by the inward and outward pointing arrows attached to the two segments allocated to each of the main themes in Fig. 1. This highlights the two-way interactive dimension of the communication and knowledge sharing process involved.
5.1. Content

“Nothing brings people back like a well-selected, reliable, integrated and catalogued set of data, especially if it is searchable and can be delivered quickly through a common interface across collections” [9].

Content is the first and most critical element in the iCAPACITY framework. Suitable and relevant content is the key to mass popularisation of the electronic medium of information sharing and access. This section reviews content development issues related to the internal needs of Nepal, and the external global audience.

5.1.1. Breathing in... content for the local audience

Good quality content is the essential pre-requisite for knowledge sharing. Yet lack of availability of relevant local content is a major problem for Nepalis and other South Asian information users. There is a dearth of information being shared digitally from and within Nepal. Currently there are approximately 100 web-sites registered under Nepal’s .np domain. By contrast a search on the Internet for web-sites on the topic of Nepal resulted in over 462 site hits relating to 23 categories (source: Yahoo). Suitable information is not lacking, but typically knowledge whether tacit or codified has been carefully guarded, and ICT capabilities and commitment to sharing rarely exist in the organisations where the knowledge banks reside. This highlights the need for awareness raising to bring commitment, and the realisation that the power of knowledge now resides not in protection, but in value-added knowledge sharing networks. Training of trainers and key personnel, is also an appropriate first step towards increased sharing, and development of capabilities. This was the strategy adopted in the initial stages of the NepalNet project.

Currently English language web-sites are the main source of “on-line” knowledge shared in Nepal, but this reaches a small formally educated minority. Local language (written and spoken) and visual content, catering for a mass local audience would be more effective than information available in other languages.

The fundamental need is to create localised content for Nepalis by Nepalis, and yet there is little sign of this type of content being effectively and extensively developed for, and accessible to Nepal’s diverse population. A Nepali font standard has been developed, but work is urgently needed to encourage locally oriented writers and web-site designers, and in developing appropriate software for linking and searching local language databases, and for other services such as localised e-commerce.

Priority areas for knowledge sharing, and content development for audiences within Nepal also need to be more clearly identified. According to Richardson [3], there are five main application areas for which the Internet has relevance in support of sustainable rural and agricultural development:

- Economic development for agricultural producers;
- Community development;
- Research and Education;
- Small and Medium Enterprise development;
- Media networks.

There has also been a need for an effective alternative platform to the Internet and the limited traditional mediums for content publication and access. Indreni represents a pioneering attempt in Nepal, to provide an adapted form of “freenet”, where localised content can be hosted and accessed. Nepali language content is also being included in NepalNet and Indreni, and represents a priority area for increasing knowledge sharing in the future.
5.1.2. Breathing out... content for the global audience

The content available on the Web about Nepal, is largely targeted towards foreigners, and originates mainly from the tourism sector. The sites designed by Nepalis living abroad, or institutions in other countries with an interest in Nepal probably outnumber those designed from within Nepal.

Opportunities for generating foreign earnings through e-commerce have been explored in a very limited way. Once more awareness raising regarding opportunities, skill development and marketing strategies are needed, as the Internet becomes more fiercely competitive. The e-commerce option holds great potential, not just for profit making organisations, but also for independent NGOs for whom, according to Vincent and Campbell [11], long-term financing strategies are becoming increasingly important for the sustainability of their innovative programmes for the poor.

In the non-commercial sector, currently the most common approach is driven by a desire simply to have a presence “on the Net”, often in response to donor expectations. Local development organisations need to develop clear strategies on what they can share or sell, and identify who will be their knowledge-networking partners or potential customers.

Common themes for development of more effective knowledge networking within South Asia and globally urgently need to be identified and prioritised. The Pan-Asia Network, which hosts NepalNet, is a good example of a platform where an Asian agenda can be discussed and developed. Similar knowledge sharing networks, such as the Asia Pacific Mountain Network2, which focus on specialist areas, can also be useful for building professional knowledge, and in guiding the agenda for content development, for the South Asian and International development audiences.

5.2. Access

For global knowledge sharing to be a truly global reality, it has to deliver equitable access where diverse and local voices can be heard. Despite the rapid and commercially driven technical progress in the “global” Internet, and its growing popularisation as a result of the World Wide Web, the status of knowledge sharing using Nepal as an example, is extremely location and economic status specific.

5.2.1. Breathing in... users throughout Nepal

Those in Nepal operating in the international context, tend to have their access and content needs fairly well met:

- The base of users with access is increasing as costs follow a trend of reducing by roughly 50% annually since 1995.
- Unlimited access is now available from US$40 per month plus telephone usage costs.
- Current estimates suggest that there are about 15,000 ISP user accounts in Nepal, with the main service demanded being e-mail.
- Competition among ISPs is increasingly healthy with the number of local ISPs increasing from four to ten during the current year.

In contrast with Bangladesh, all Nepal’s ISPs originate from the commercial sector, and target their growing range of services on those residing in the larger cities and towns.

Whilst content availability is critical, without access its value is limited and potentially divisive. If appropriate measures are not identified and implemented, the knowledge gap between the mainly urban based “haves” and rural based “have-nots” in Nepal is likely to increase due to the IT revolution. Lack

2http://www.mtnforum.org.
of access\(^3\) amongst the less privileged excludes them from the information chain, and minimises their participation in the creation of information.

Easier and affordable access is the key to taking the information revolution to the masses. This involves two major issues related to access: availability of appropriate technology, and cost. The need is to make access less formidable, and not limited to the wealthy and elite sections of the society.

Yeomans [13] refers to the need for development of what he terms “a ‘third world’ computer, with ‘software and machines that can be used and supported by people largely without literacy and ICT skills, using alternative power sources, and connectivity free of fixed telephone lines’.” This type of “quantum leap” in terms of information technology designed specifically with the poor in mind, would be an initiative to be greatly encouraged, and warrants the joint efforts of those countries like Nepal, which would benefit most.

However cost barriers facing the poorest also need to be addressed, since according to Medows [8], “even when users in developing countries have adequate technical resources, they are faced with other financial problems. Thus, the cost of electronic communication is often inversely proportional to the per capita income of a country”.

Given this context, it is clear that private sector initiatives need to be supplemented by programme interventions promoting rural connectivity and access for the poor. Initiatives are particularly needed throughout the education system, and at the community level. District based tele-centres offer one way forward, and there is also considerable potential for working in partnership with community radio, through promoting internet connection and drop-in centre facilities at the radio station premises.

ICIMOD and NIUG in their respective projects have set up drop-in centres where Internet is made available free of charge. These centres provide windows to the information world, for those who otherwise cannot afford access or lack the equipment. Assistance is provided, so that individuals not acquainted with Information systems can quickly become familiar.

Projects like Indreni – the Nepali Intranet, can according to Upadhaya [10], provide a “low cost public electronic publishing platform using the latest Internet technology”. Know-how and the technical means to access remains a barrier, but the system is open for anybody with access to a computer, modem and telephone line. Procedures for connecting are well publicised, and there is incentive for people to access, because of the localised content. With its focused content and similarity to the Internet, Indreni is an ideal starting point for an organisation foraying into the electronic information world. When organisations and individuals want to move on to the Internet, their learning curve and costs will also be reduced.

Use of drop-in centres, free to access networks such as Indreni, and development of more appropriate ICTs highlight options for popularising use of on-line information and for widening access to greater numbers of people in both rural and urban areas. If carefully designed and targeted they could also be used to promote more equitable and gender balanced access among the population.

5.2.2. Breathing out... South Asian and global access

Promoting global access to Nepal’s knowledge needs to be given greater attention by the development sector. Apart from NepalNet, the few initiatives that have been undertaken independently by organisations, have tended to be supply driven and unclear in focus.

It is important that a form of “marketing research” is carried out, to identify what kinds of demands for knowledge from Nepal exist, within South Asia and globally. A strategy for providing on-line information systems to meet these needs can then be developed and monitored. This higher level monitoring should provide overall statistics about visitors to a sample of Nepal related sites, and answer questions.

\(^3\)In 1996, according to the 1998/99 World Bank Report, there were only 5 main telephone lines per 1000 people.
such as what type of sites are most visited, and where the visitors to these sites are coming from? This type of data would assist development and planning agencies in providing and promoting access to content internationally.

Tools for promoting access are also particularly important on the Internet. A South Asian search engine or “umbrella site” that truly integrates development themes, local and international languages, and gives adequate weight to the content from smaller countries needs to be developed. In meeting this need, there is scope for integration with commercial initiatives, but this requires some form of South Asian membership forum which can take a lead in negotiating.

5.3. Partnerships

Electronic content creation in itself is not an independent task and creation is not the ultimate goal. The goal is easier and equitable access to global knowledge from wherever it may originate. The cycle of information creation and subsequent access, requires authentic partnerships between the Knowledge industry, the Information Technology (IT) industry and other stakeholders, including the public.

Inputs are also required from organisations that are better placed to facilitate mutual understanding and productive relationships between the development and commercial agencies. The IT industry needs to understand the importance and dynamics of information networking for development agencies. Many local developmental agencies require handholding, as they tend to shy away from newer technologies, fearing their costs and potentially adverse social implications.

5.3.1. Breathing in – local partnerships

Building of partnerships and networks is not a simple process, particularly as relative power has to be recognised in relationships. Without trust building, tacit knowledge in particular and also codified knowledge, depending to some extent on cultural context, can be carefully guarded. Faced with this difficulty, networks with a shared goal and committed to a long term relationship clearly have great potential, and are particularly suitable for providing added value through information sharing networks. Knowledge and learning shared among NGOs and INGOs, can reduce research and consultancy costs, lead to better practice, and strengthen their funding position. Strong networks can also advocate locally and promote the development of a supportive institutional environment. The added effect of the partnership building process would also be the assimilation of tacit knowledge, by virtue of stakeholder participation.

NIUG has been facilitating interaction between the IT industry and the public at large. It provides partnership opportunities between individuals and different kinds of organisations, be they commercial or non-commercial, and itself partners with other organisations to bring the issue of content and access to public attention. NIUG’s experience in promoting Indreni as a knowledge network, significantly involves its primary stakeholders (i.e., its members and users), as partners. This involvement is very important in developing effective knowledge sharing partnerships.

NepalNet, provides a good example of a successful partnership approach, since it involves 34 organisations, with similar goals, in working together to share and publish information in a freely accessible form. ICIMOD initially acted as the facilitator of the project (and as mentioned earlier, is in the process of transferring the role to NIUG), and provided essential technical and organisational support.

The task of bringing together organisations is not an easy one, as interest and motivation can vary greatly. Organisational and management expertise of a particular type are needed. The NepalNet experience highlights the need for a good facilitating and co-ordinating agent, who understands the knowledge industry and the technology as well. In this regard, the involvement of NIUG in the case of Indreni and ICIMOD in case of NepalNet, are critical factors, instrumental in how well the partnerships move ahead.
NGOs like NIUG, that play an intermediary role, and focus on new technology, are few and far between, and need to be encouraged in the development sector.

As the number of partners grow, organisations working in similar sectors also need to be grouped, so that relevant information exchange can take place at the sectoral level. Indreni and NepalNet both provide evolving examples of how specialisation and integration of on-line knowledge need to be developed and linked. However, in Nepal these are not the only information networking initiatives. Networks of organisations are, or could be, usefully supporting the development of content for initiatives such as health, literacy, availability of market information (prices), distance and formal education, good governance and transparency.

Sustaining networks in the longer term is a key issue, and one which may lead to certain types of knowledge being sold commercially. An e-commerce mall designed specifically for South Asian NGOs, has been launched by the Pan-Asia network, and is now being actively explored by NIUG and NepalNet partners, as an additional avenue for financing and also for disseminating development sector knowledge.

5.3.2. Breathing out – international partnerships

Fowler [4] writing for development practitioners, emphasises the need for authentic partnerships and strengthening of social networks. These partnerships exist at different levels in different forms. As they move along a spectrum encompassing networks, alliances, consortia, coalitions and co-ordination, a degree of autonomy is lost but the potential gain in terms of impact and scale increases, as additional resources can be mobilised and collective legitimacy increases.

Nepal has already benefited through involvement in exchanges of know-how and visits arranged by supportive agencies. Maximising the mutual benefits of collaboration at the international level in a fast changing context, is clearly an area of great potential.

Considerable opportunities now exist for partnerships that go beyond basic level networking. With a clear vision and shared commitment, relevant fora like the Global Knowledge Partnership and Pan Asia Networking, should be developed and used to:

- provide a voice for all South Asian countries to influence the development of the global Internet, and put forward their agendas;
- share learning and best practise;
- design appropriate technology and services (including those for the poorest communities);
- develop regional initiatives in relation to content and infrastructure;
- establish larger scale linkages with donors and commercial sector partners, and co-ordinate both inter and intra-regional investments to achieve economies of scale;
- co-ordinate and facilitate between individual country governments, and development and commercial organisations.

5.4. Integration

Figure 1 draws together into an integrated capacity development framework the themes discussed. However it would be ineffective to address content, access and partnership issues in isolation of each other. The experiences from Indreni and NepalNet, show that these issues are inter-dependent and that the country context is extremely important. For the successful development and interaction of local and global knowledge systems the socio-cultural and political environment, together with the institutional framework, are particularly relevant in developing countries.

At the heart of the framework, key development values and principles in relation to equity, empowerment, gender, participation and efficiency, are also highlighted. Clear commitment to these values and
principles is needed in order to bring about a clear and integrated strategy that is in line with the cultural and social aspects of the particular country.

6. Conclusion

“It is important that the ‘transition economies’ of South Asia be able to adopt and adapt all technologies from around the world to serve the needs of our own economies and societies” (Himal, 1998).

The “iCAPACITY” framework formulated and presented in this paper, represents a first attempt to draw together into a replicable framework the early lessons of experience in knowledge sharing using ICT, with reference to two examples from within Nepal’s development sector. It could certainly be enhanced by reference to the experience of other developing countries, and where quantitative data is available indicators could be related to the main or sub-themes that are highlighted in Fig. 1, and indeed other frameworks (such as those oriented to assessing institutional level ICT capacity) could be linked as appropriate. Overall indicators for content, access and partnership could potentially be formed and aggregated for comparative purposes in the LDC context.

Korten [6], has highlighted that development agencies need to learn first to be effective, then to be efficient, and finally to maximise impact by learning to expand and scale up. This framework captures some elements of all these three stages. It does not claim to be comprehensive, but seeks to highlight priority areas of relevance to Nepal and other countries currently “breathing the thin air of cyberspace”.

Key points arising from the experience-based review carried out in this paper are:

- Creation of relevant local **content** would create wider demand for access, and lead to a “virtuous circle” involving further creation of content and increased access.
- Issues of **access** can only be resolved locally, with appropriate technology used according to the needs of the people.
- Relevant content can be created through authentic and supportive **partnerships** amongst local and regional institutions.

If these aspects are appropriately addressed in future initiatives, the vision of an equitable global electronic information exchange could one day be fulfilled.

References


About the authors

**Jon Gregson** has been working as an IT specialist in the United Kingdom since 1984 and from 1993 to 1997 he was an Assistant Professor at Kathmandu University School of Management. Subsequently work in Nepal included development and IT consultancy for Non Governmental Organisations and he was one of the co-founders of the Nepal Internet Users Group in 1997. In 1999 he joined the International Centre for Integrated Mountain Development (ICIMOD), and worked as an Internet and Connectivity Specialist, supporting ICT projects in Bhutan, North India, North Pakistan, Tibet and Nepal. He is currently completing an MSc in Managing Rural Change from Wye College, University of London, and his research interests include use of ICTs in Developing Countries particularly for the benefit of rural communities.

**Gaurab Raj Upadhaya** has been working in the IT field in Nepal for the past 4 years. He was one of the founders of the Nepal Internet Users Group, and also worked in the NepalNet project during its initial stage. He is currently working with United Mission to Nepal, in developing their IT infrastructure. He regularly contributes to the local media on IT related issues. He is also a student at Tribhuwan University. He is interested in contributing his technical skill in developing countries.