

## **E-Readiness Matrix**

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An e-Readiness assessment, when properly applied in a larger process of evaluation, is a first step towards converting good intentions into planned actions that bring real changes to people's lives. E-readiness assessments are meant to guide development efforts by providing benchmarks for comparison and gauging progress. This is an old process adapted to today's technology realities; determining the current situation in order to plan for the future and advocate specific changes.

Center for International Development (CID), Harvard University defines an 'E-Ready' society is one that has the necessary physical infrastructure (high bandwidth, reliability, and affordable prices); integrated current Information and Communication Technologies (ICTs) throughout businesses (e-commerce, local ICT sector), communities (local content, many organizations online, ICTs used in everyday life, ICTs taught in schools), and the government (e-government); strong telecommunications competition; independent regulation with a commitment to universal access; and no limits on trade or foreign investment.

CID's Readiness for the Networked World measures 19 different categories under five titles: the availability, speed, and quality of network access, use of ICTs in schools, workplace, economy, government, and everyday life, ICT policy (telecommunications and trade), ICT training programs, and diversity of organizations and relevant content online.

### **Introduction:**

Nepal's journey into the world of information and communication technology began three decades ago, with IBM 1410 for the population census of 1971. Institutional initiative to promote computer awareness and provide computer literacy began with the government's establishment of the Electronic Data Processing Center in 1974, which was later, named as National Computer Center (NCC). It purchased the fourth generation computers in 1981. The computer training in Nepal started from 1971, when American experts provided training in AutoCoder programming to operate the IBM 1401 computer. The promotion of computer education in the national education system started only in the early 1990s. The centre for curriculum Development, under the Ministry of Education, designed computer science courses for the 9<sup>th</sup> to 10<sup>th</sup> grades in secondary schools. In 1992, eight private schools offered computer science as an optional subject for S.L.C. examinations. Kathmandu University started offering one course in computer science for I.Sc. before offering admission for B.E. in computer science. Internet in Nepal started with the e-mail services provided by Royal Nepal Academy for Science and Technology. Mercantile office system started e-mail services for commercial purposes in June 1994.

And after a year, on 15<sup>th</sup> July 1995 it started to provide full online access to Internet services and a presence for Nepal on the Internet by providing a home page.

In 1995, there were about 150 email addresses in Nepal. However the growth rate till 2002 was more than 150% per annum.

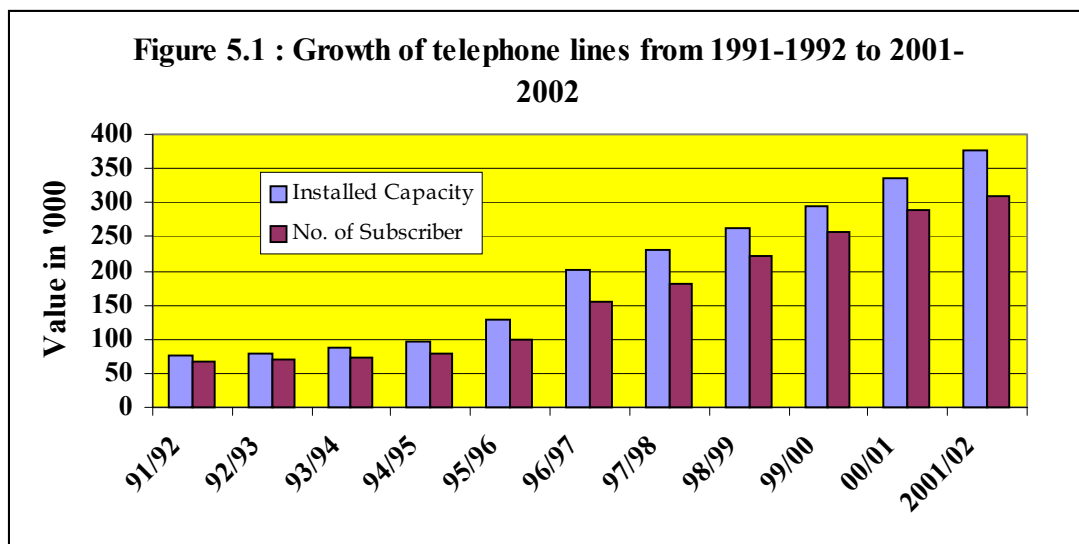
## **I. Network Access:**

### **Information Infrastructure:**

#### **Basic Telephony**

Nepal Telecommunications Corporation (NTC), the monopoly operator, is the sole provider of basic telephony services in Nepal. Telecommunication plays important role in Nepal, as most of the land is covered with high mountains and transport facilities are inadequate. Due to some factors like financial constrains, total dependence on imports for supply of equipment and lack of infrastructure etc, telecommunication services are not universally available and the tele-density as low as 1.4.

According to Nepal Telecommunication Authority, a license has been provided to another operator in private sector for basic services. Besides, there are 16 ISPs in operation, 6 VSAT service providers, 16 VSAT service users, 8 radio paging network, 1 video conferencing and 6 fax mail services. Figure 5.1 depicts the growth of telephone lines from 1991-1992 to 2001-2002.



It may be noted that the major growth started since 1995. The number of telephone line distributed in the year 1996/97 was more than triple than the year 1995/96. About 65% of the existing lines are concentrated in Kathmandu Valley. There is an extreme variation among the five development regions of Nepal in terms of telephone distribution. The

lowest is about 3% in Far Western Region whereas highest is 70% in Central Region including Kathmandu valley. As of mid-February 2002, 1761 VDCs among 3914 VDCs in the kingdom were facilitated by telephone service.

New subscriber has to pay 68,00 Rs (around US \$90) for new phone line connection with minimum rental charges of 200 Rs (around US \$ 2.6) for 175 rebate calls per month and 75 Rs (US \$1) per 75 calls then after.

Nepal's international connection consists of a "standard A" satellite earth station and a smaller "standard B" earth station at Balambu, about 10KM from the Kathmandu city. Nepal is linked to India via terrestrial and Satellite network. The terrestrial link to India is optical fiber cable. Nepal has a digital microwave radio link to Bangladesh. Total circuit capacity has reached to 1084, enabling direct international access to 131 countries.

Alternate high capacity backbone route based on optical fiber cables will be established connecting the eastern and western part of the country with Kathmandu. This high capacity route will provide main infrastructure for the future information need of the country.

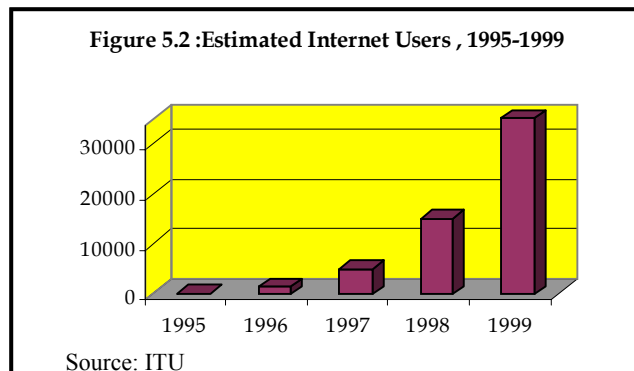
### Mobile Telephony

In 1999, NTC introduced cellular mobile telephony based on the GSM standards. In the year 2002, there were 30,000 mobile subscribers in Kathmandu valley, Biratnagar, Birgunj and Pokhara. Monopolized cellular telephony has been slow to pick up in Nepal because the initial investment used to be 50,000 Rs (US \$ around 666.5) and per minute charge for outgoing calls was Rs. 6 (US \$0.08) and Rs. 3 (US \$0.04) for incoming). It is picking up due to increase in line capacity as well as decrease of charges. Now the installation charge is 15,000 Rs (US \$ 20) and mobile usage charges are Rs 4 (US \$ 0.053) for outgoing and Rs 2 (US \$0.026) for incoming in addition to 500 Rs (US \$6.66) minimum monthly charge. Recently, NTC has announced that within a month or two incoming charge will be free and will reduce the outgoing tariff for the mobile subscribers.

NTC started to offer, since December 2001, international roaming service with BT CellNet, U.K. and six mobile operators in India. NTC is also providing Short Messaging Service, Fax, Data, Voice Mail. NTC is planning to introduce pre-paid mobile soon and all the major towns along the east-west highway will be expanded under the mobile service.

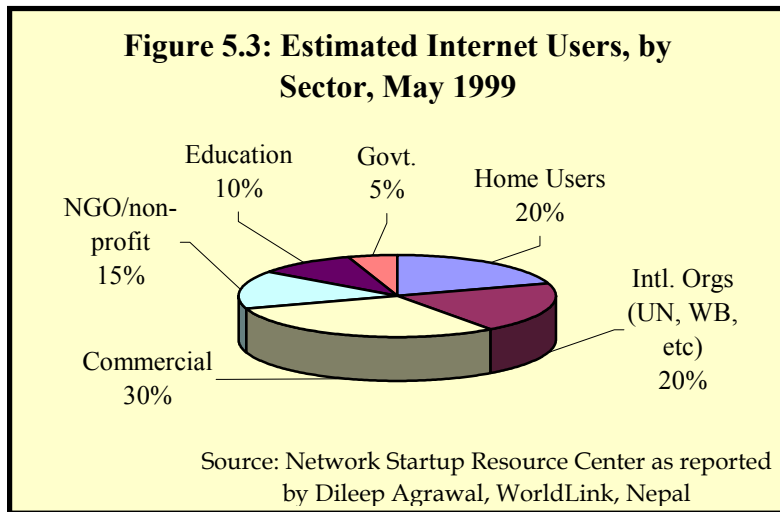
### Internet Availability

It was observed that access-to-information threshold today is lower



than ever before -even in Nepal. According to the ITU, estimated Internet users in Nepal have grown substantially as may be seen in the figure 5.2. Although the Internet subscribers were 30,000, today, Nepal may have 100,000 to 125,000 Internet users with all the 16 ISPs.

There are more than 25 Point of Presence in urban areas of Nepal. All the regional headquarters have a dial-up access to local POPs through local PSTN exchanges unlike one year back when remote users have to use STD lines to get Internet connection. The combined bandwidth with all the ISPs is around 25 MBPs. Some of them are using their own VSAT for unlinking. Figure 5.3 detailed the sector-wise Internet users. It may be noted that commercial accounted for 30% of the Internet followed by home users (20%),



and international organizations (20%) and education (10%). It was also observed that large organizations and enterprises deploy lease lines for Internet access, viz., Donors, Developing Agencies, Private Banks, Publications, Security Agencies, Schools, and University etc. There are more than 500 cyber cafes all over Nepal, with 50% located in

Kathmandu valley. It was observed that cyber cafes have spring up remote villages as well as in Everest base camps.

**Internet Affordability:**

With opening up of Internet service market, prices have fallen down. In the beginning of 2003, unlimited usage charge costs around US \$100 per month. Cyber Cafes are offering less than half a dollar per hour for Internet usage.

Telephone charges on the other hand are very high. It was noted that telephone charges have gone up due to tariff rebalancing against international calls. Internet users pay dial-up connection charges to NTC, about half a dollar per hour, which is as much as the Internet usage charges.

**Network Speed and Quality:**

In Nepal, the network speed and quality remains much to be upgraded. Bandwidth is also limited (15 MB) amongst the ISPs. Dial-up modem speed is 56 Kbps and leased lines transfer speed is 64 or 128Kbps. Faster data transmission technologies like ISDN are not

available for public use. Some companies do use VSATs for up linking. Subscriber's complaints per 100 lines is 6.42%. It was stated that within 24 hrs. the monopoly operator could attend 60% of the complaints.

### **Hardware and Software:**

A strong base of IT software and services companies is emerging. They are able to meeting national software development requirement. A number of joint ventures have come out with US, Japan and India to take advantage of the talented manpower in Nepal to develop IT applications.

Computer hardware was available from variety of vendors, such as, Compaq, Dell, Fujitsu, HP, Cannon, NEC, Acer, Epson, Toshiba etc. A few local vendors were also assembling computers. It was estimated that 500 companies provide IT solutions, software services, training and local content creation.

### **Service and Support:**

It was noted that large corporations have set up their chain of distributors and after sales and support networks with local vendors. However, most of these concentrated in the Nepal Valley. Remote sites were difficult to access and thus the service level commitments were inadequate. Software applications, since were locally developed, companies were able to support them across the nation.

## **II. Network Policy:**

### **Telecommunications Regulations**

The Act of 1997 established a telecom regulator Nepal Telecommunication Authority (NTA) to manage and regularize the Telecommunications Service and making it reliable and easily available to the public. In exercise of the powers conferred by Section 61 of the Telecommunications Act 1997, Government of Nepal formulated The Telecommunications Regulation 1998 for the license regime. All communications made using information and communication technologies come under the purview of the Telecommunication Act 1997.

It was mentioned that the regulatory and policy making role of Nepal Telecommunications Corporation was decreasing and their focus was shifting towards service provider, so as all operators could have equal treatment. Tele-density was expected to grow from 1.4 in 2003 to 3% in 2007 and 15% by 2017. Emphasis was laid on Build-Operate-Transfer mode for the new operators; FDI was allowed upto 80% of the total investment. With these, market was expected to liberalized by 2004.

## **ICT Trade Policy**

E-commerce policy has not been visualized with trade development focus. It is the part of the IT policy and thus, it was observed that e-commerce was considered to be a technical issue by the policy makers.

## **III. Networked Economy:**

### **ICT Employment Opportunities**

Ministry of Science and Technology, His majesty's Government of Nepal attaches priority for development of the IT industry. It is considered to be the main industry that would employ large force of talented young manpower to develop IT applications, create contents, provide Internet based services, and outsource business processes (BPOs). Companies like, Hitechvalley, Mercantile and Lotus Holdings have demonstrated that IT could be one of the industries that shall lead rapid development of Nepalese economy and emerge as the second largest industrial sector in Nepal. Besides, more and more organizations and enterprises are getting computerized, necessitating demand for skilled manpower.

### **E-Governance**

Government of Nepal considered deployment of e-governance applications to bring about a paradigm shift to improve interface with citizens, business and institutions. A comprehensive plan has been formulated, which would be implemented through National Information Technology Centre (NITC).

Presently, it was observed that most of the government department have been provided with computers but they are not networked with other departments making them work as stand alone systems. Interoperability and portability of data is not available. However, a number of government ministries and institutions have developed their web sites. Policy papers, Acts, regulations and government related documents are accessible from these web sites. Telephone subscribers bills, driving license and similar other service related forms could be downloaded on-line. Custom clearance procedures have been automated. Bill of loading could be found on-line through designated terminals within the customhouses.

## **IV. Networked Learning:**

### **School's Access to Information and Communication Technologies:**

There were 37566 schools in Nepal with student population of 4.9 million. About 200 schools offered computer studies as an optional subject or extracurricular activity in 2001. These were mostly private schools, which were having their web sites and trying to

E-Readiness Matrix, NEPAL. 2002/2003.

give Internet access to their students as a part of curricula. But majority of the schools have no access to PC and Internet. School web portal like [www.edunepal.com](http://www.edunepal.com) is providing a forum for education sector.

Two universities, Kathmandu University and Pokhara University, have their own web site and information on departments and faculties. The largest and the oldest Tribhuvan University do not have its own web site in spite of having its own institution, Institute of Engineering, which is offers engineering courses in computer science.

### **Enhancing Education with ICTs**

Distance education is growing. One of the Nepalese universities is offering distance education in limited sector like education faculty. Students are enrolled in foreign universities through their local agents in Nepal.

Students of higher level in urban cities like Kathmandu and Pokhara are using Internet for references, sharing information on mailing lists, staying in touch with teachers etc. However, e-learning was not popular because of the low penetration of Internet and non availability of e-contents.

### **Developing the ICT Workforce**

Fours universities, namely, Tribhuvan University and Affiliated Colleges, Kathmandu University, Pokhara University and Affiliated Colleges and Purvanchal University were offering IT related academic courses with annual intake of 4,000 students.

It was observed that the number of colleges offering IT courses and their capacity is growing every year. A number of colleges are being opened with affiliation from foreign universities, offering IT courses. Private training institutes are now offering long-term professional training courses. Several training institutes in Nepal have been franchised to open institutions from India, Singapore and UK.

A large pool of technical manpower was being developed but at present there was a shortage of professional managers and technical experts to develop the IT industry. Most of the IT graduates were migrating to US and other developed countries for better opportunities.

## **V. Networked Society:**

### **People and Organizations Online**

It was mentioned that trade fair “CAN InfoTech 2003” was visited by more than 100,000 people and about 70% of the people visited were students. According to an estimate

given by Computer Association of Nepal there may be more than 70,000 PCs in Nepal and more than 100,000 Internet users in Nepal. Popularity of Internet was growing in Nepal.

**Locally Relevant Content:**

Locally Relevant Content both in Nepali and English are available in Internet. Also Internet magazine has been started to promote the entertainment culture and provide information about Nepali film industry. The Web has given all the possible space for different languages of Nepal. Radio Nepal on the Internet can be tuned on to listen to the news on other languages as well.

Content Service Providers have emerged on the web to provide information in the shape of brochureware. Mercantile Office Systems' *www.south-asia.com* and *NepalNews.com* are very popular Internet destination serving sectors like GOs, INGOs, NGOs, news papers, Embassies, hotels, schools etc.

NepalNet, a consortium of 34 Nepalese institutions have been established on September 17, 1998 to share available human, technical and information resources using the Internet, with the focus on the socioeconomic, agricultural, environmental, and sustainable development sectors of Nepal. This has enabled NGOs to gain access to Internet, and started to contribute content through NepalNet. Another network called HealthNet provides email services, electronic conference, electronic publications, and access to medical databases. Currently there are more than 500 users of HealthNet in Nepal.

**Information and Communication in Everyday Life**

Email and web site addresses are getting common in the business cards. Villagers are using phones to trade their products in the urban markets. People are using ICT for their day-to-day business. Telephones, mobile phones, pagers, Internet, computer are being used in most of the urban areas of Nepal. Cyber cafes are getting popular even in remote parts of Nepal where telephone service are available.

**Information and Communication in the Workplace**

Penetration of IT is growing both in government and business. Application of ICT in government and business sector are getting popular. The table 5.1 depicts the level of IT penetration within different segments. It may be noted that penetration of IT in the Government was only 10% in March'2003. Many government organizations and Public Sector uses computers for word-processing, communication etc.

Accounting and personnel record systems etc. are the first application software they used. Private banks and financial institutions are the leader in implementing ICT in their works.

| <b>Table 5.1: Level of IT penetration</b> |                |
|---|----------------|
| <b>Source: CAN 2003</b>                   |                |
| <b>Organization</b>                       | <b>Percent</b> |
| Government                                | 10%            |
| International NGOs                        | 100%           |
| MNCs                                      | 100%           |
| Large Business Houses                     | 70%            |
| Medium Company                            | 50%            |
| SMEs                                      | 10%            |
| Financial Sector                          | 80%            |
| Travel Trade                              | 80%            |
| Distribution                              | 30%            |

They are the largest consumer of Nepalese ICT products like software and services. Local software companies are developing software for finance companies, banks & co-operatives. Almost 75 percent of such companies have already used finance software in their organizations.

Computerization in manufacturing and other sectors ranged from 100% in MNCs to 10% in SMEs. The widely used application of computer is in accounting, payroll and communication. A few companies used IT for helping pre-manufacturing and post manufacturing process. A greater number of carpet and ready-made garment factories are using inventory and order tracking system that is custom made by different software developers.

Tourism industry is ahead in the use of computers. Almost all the airlines are equipped with locally developed Airlines MIS and hotels, travel & trekking agents are using locally developed software for their front office, back office, accounting and trekking management works.

Hospitals are slowly getting computerized, whereas, most of the medicine distributors are already computerized. Some of the pathology labs use computers for report management.

Major departmental stores are computerized while small and medium sized shops still use manual means. ISPs and computer vendors use custom software for accounting purposes but surprisingly training institutions are not making much use of it. Many Nepalese organizations have web presence and some of them are already producing promotional CD-ROM as well. Some companies like OnlyAtNepal.com are producing telephone and business directories on CD-ROMs and selling quite well.

## **V. Findings:**

Based on the above analysis, e-readiness matrix for Nepal is given at table 5.2

**Table 5.2 : Assessment of e-readiness of Nepal**

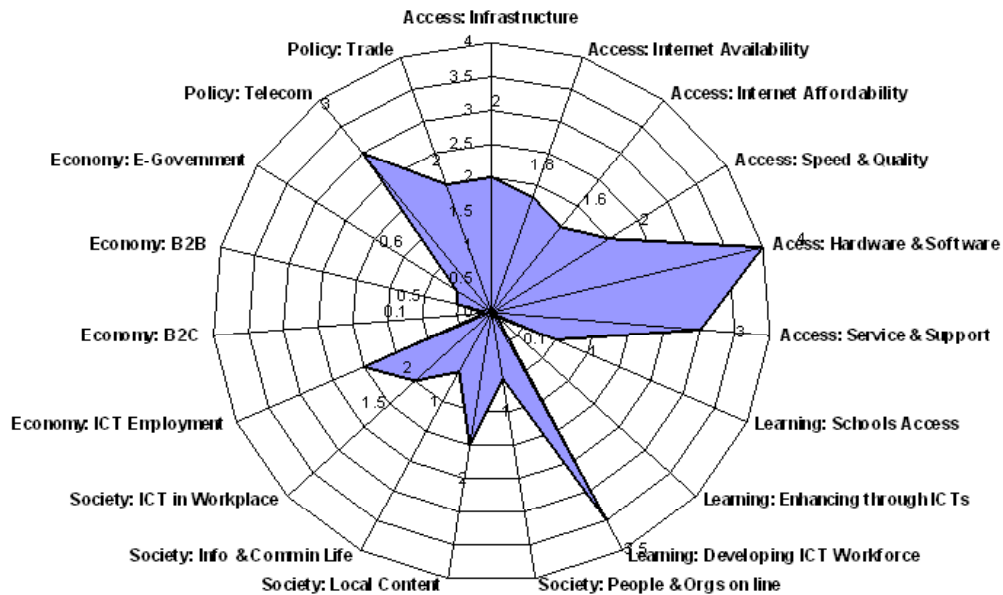
| Category           | Description                   | Nepal |
|--------------------|-------------------------------|-------|
| Network Access     | Information infrastructure    | 2.00  |
|                    | Internet availability         | 1.80  |
|                    | Internet affordability        | 1.60  |
|                    | Network speed and quality     | 2.00  |
|                    | Hardware and software         | 4.00  |
|                    | Service and support           | 3.00  |
| Networked Learning | Schools access to ICTs        | 1.00  |
|                    | Enhancing education with ICTs | 0.10  |
|                    | Developing the ICT workforce  | 3.50  |

E-Readiness Matrix, NEPAL. 2002/2003.

|                   |                                 |      |
|-------------------|---------------------------------|------|
| Networked Society | People and organizations online | 1.00 |
|                   | Locally relevant content        | 2.00 |
|                   | ICTs in everyday life           | 1.00 |
|                   | ICTs in workplace               | 1.50 |
| Networked Economy | ICT employment opportunities    | 2.00 |
|                   | B2C electronic commerce         | 0.10 |
|                   | B2B electronic commerce         | 0.50 |
|                   | e-government                    | 0.60 |
| Network Policy    | Telecommunications regulation   | 3.00 |
|                   | ICT trade policy                | 2.00 |
|                   | Cyber Policy                    | 2.00 |
|                   | Average:                        | 1.73 |

Source: ITC Project File, March 2003.

Inputs were also obtained from Computer Association of Nepal, Trade Promotion Centre, National Planning Commission, National Information Technology Centre, Federation of Nepalese Chamber of Commerce and Industry, Nepal Telecommunications Corporation, Information Technology Professional Forum and other authorities involved in Nepalese IT economy. Based on the analysis of this information, Nepalese networked readiness may be seen at figure below.



Source ITC Project File  
March 2003

The average score of Nepal was 1.73, which indicated that its overall level of e-readiness in March 2003 was still very low.

## **VI. References:**

- Cyber Post, [www.nepalit.com](http://www.nepalit.com).
- MIS Reports of Nepal Telecommunications Authority [www.nta.gov.np](http://www.nta.gov.np).
- MIS Reports of Nepal Telecommunications Corporation [www.ntc.net.np](http://www.ntc.net.np).
- Readiness for the Networked World: A Guide for Developing Countries, Center for International Development's, Harvard University.
- Subba, Rajib, et. al. B2B e-Marketplaces in Nepal. A global collaborative network on e-business development. Building e-business competencies of the information society "empowering SME exporters through ICT. Geneva, Switzerland: International Trade Center/UNCTAD/WTO, 2004. [www.intracen.org](http://www.intracen.org).
- Subba, Rajib and Chhabi Lal Gajurel. Human Resources Development: Information Technology for Development, Information Technology Policy and Strategy Papers for Nepal. Eds Greta M. Rana, et. al. Nepal : International Center for Integrated Mountain Development and National Planning Commission, Nepal. 2001, pp 87-114. ISBN 99933-201-0-2.