Connecting the Villages of Rural Nepal to the Internet through Nepal Wireless Project - Experience, Challenges Faced and Road Ahead

Mahabir Pun

E-Networking Research and Development
Open Learning Exchange Nepal
Nepal Research and Education Network
Nepal Wireless

What's the Problem?

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"This project is extremely important, but it has no budget, no guidelines, no support staff and it's due tomorrow morning. At last, here's your chance to really impress everyone!"

Nangi, My Home Village

Beginning in 1993 – Volunteer at Himanchal High School

Income Producing and Job Creation Projects

Yak Farm

Yak And Cow Cross Breeding Farm

Cheese

Fishery

Paper Making

Paper Products

Sewing Training

Bee-keeping

Nettle Cloth Making

Handicraft making

Health Training Programs

Dental Training in Nangi village

Suturing

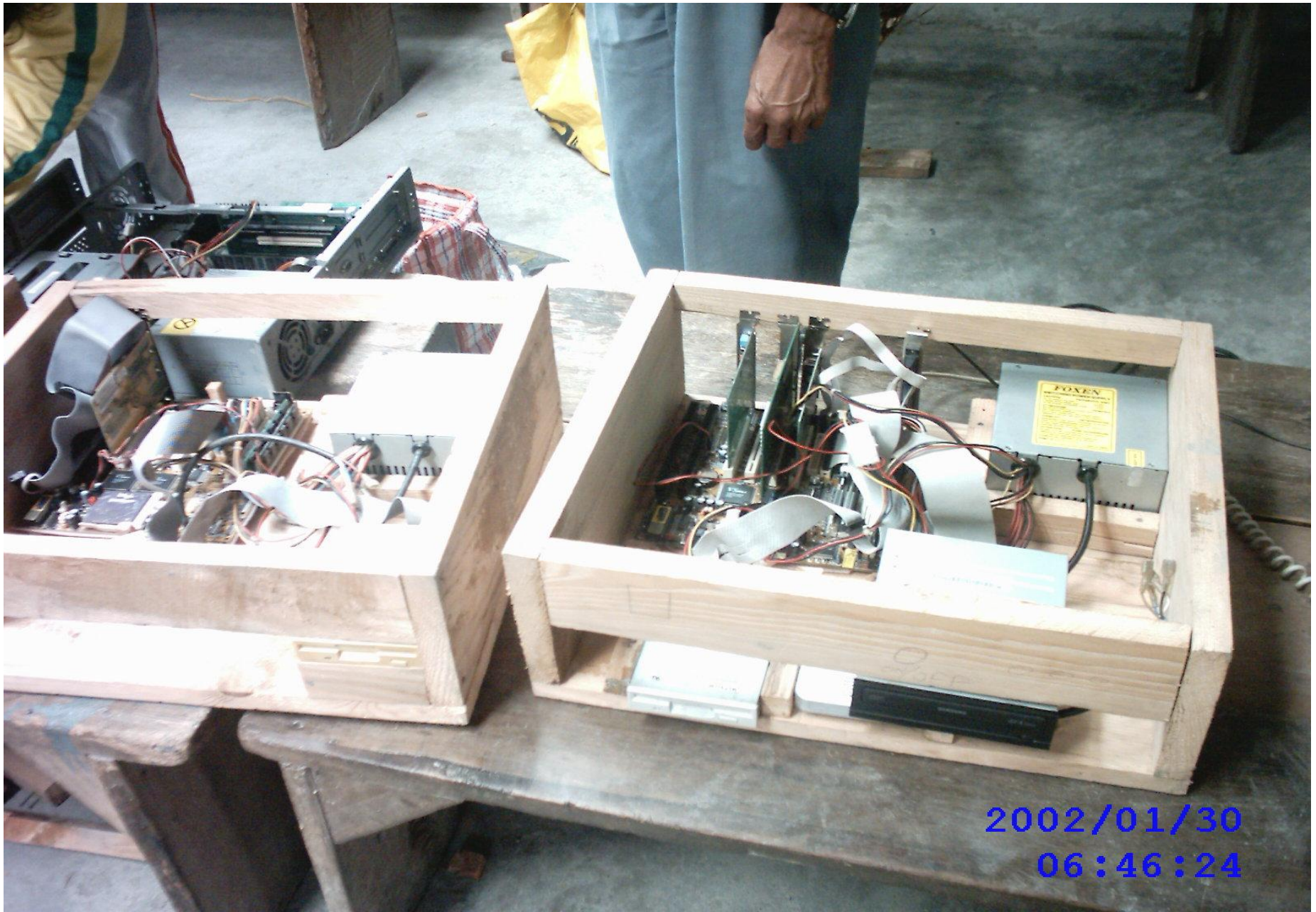
Local Health Worker

Health Training in Nangi village

Computer Education and Wireless Networking Project

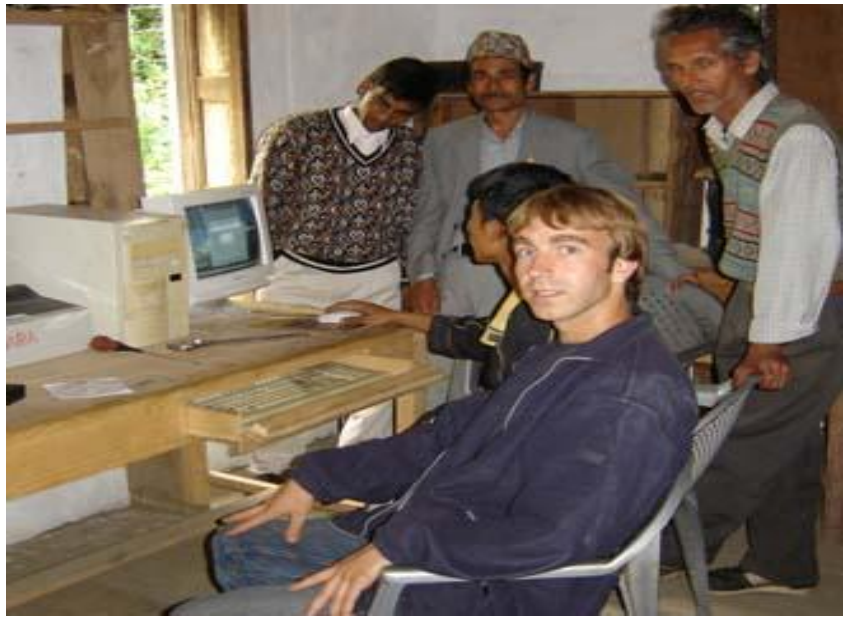
Built Computers in Wooden Boxes in 1998

Used Computers



Built Village Computer Labs

Got help from Volunteers to bring in Equipment & Build Network

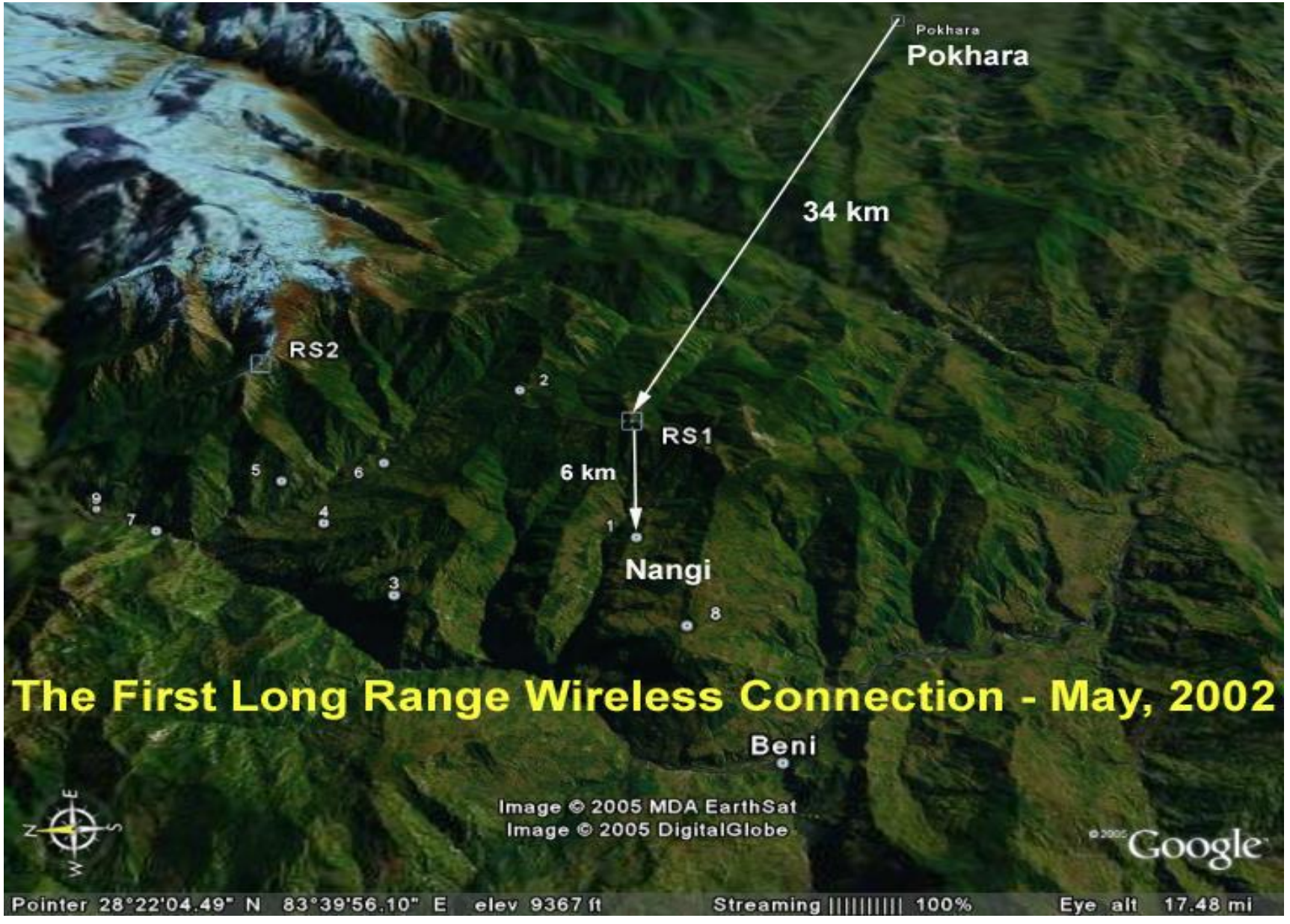


DLink 900AP Wi-Fi Router, Maximum Outdoor Range 100 m

Carrying equipment in the mountains for testing

Photos of the First Long Range Testing 2002 @ Mohare

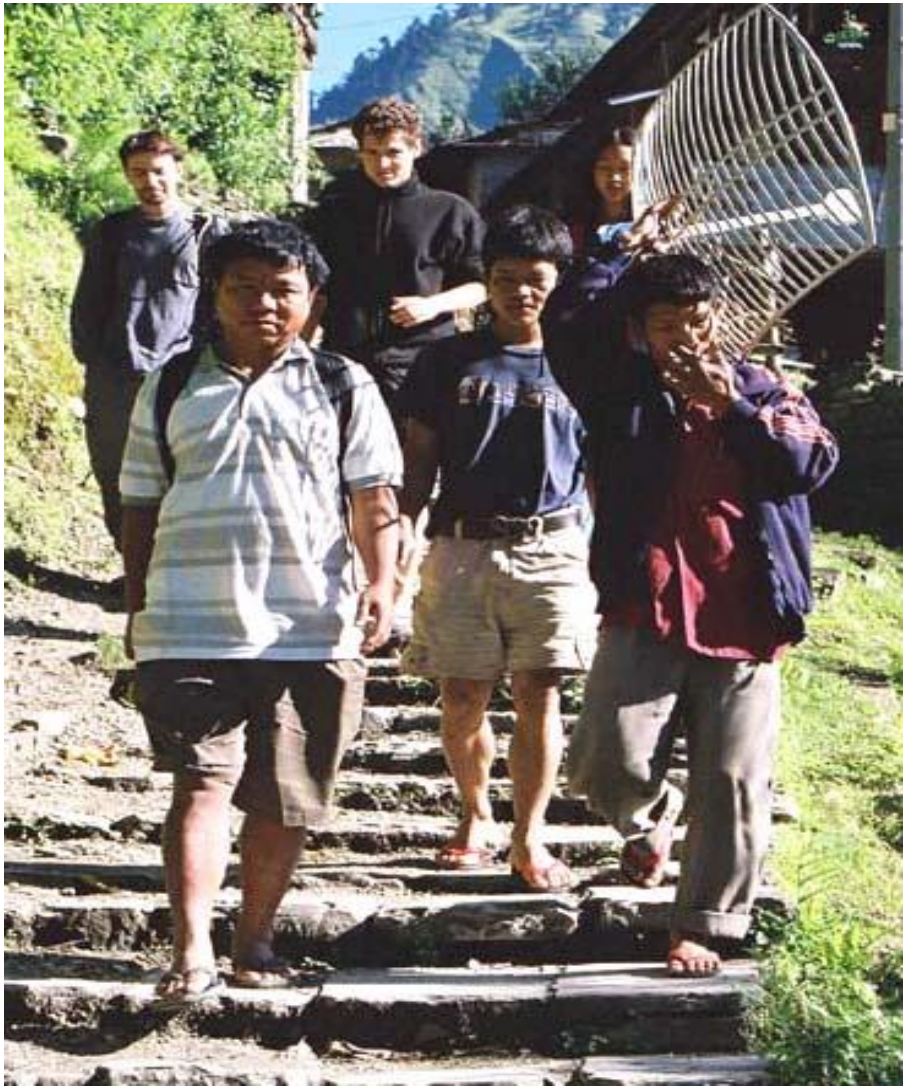
The First Long Range Wireless Link Made in May 2002



Implementation Phases I (2004)

Support from an Undergraduate Student from UCLA in 2003

Implementation Phases I - 2004



College Students from the US as Volunteers

Khopra Relay Station in 2004 – Elevation 12,500 ft

Mohare Relay Station in 2004 – Elevation 11,000 ft

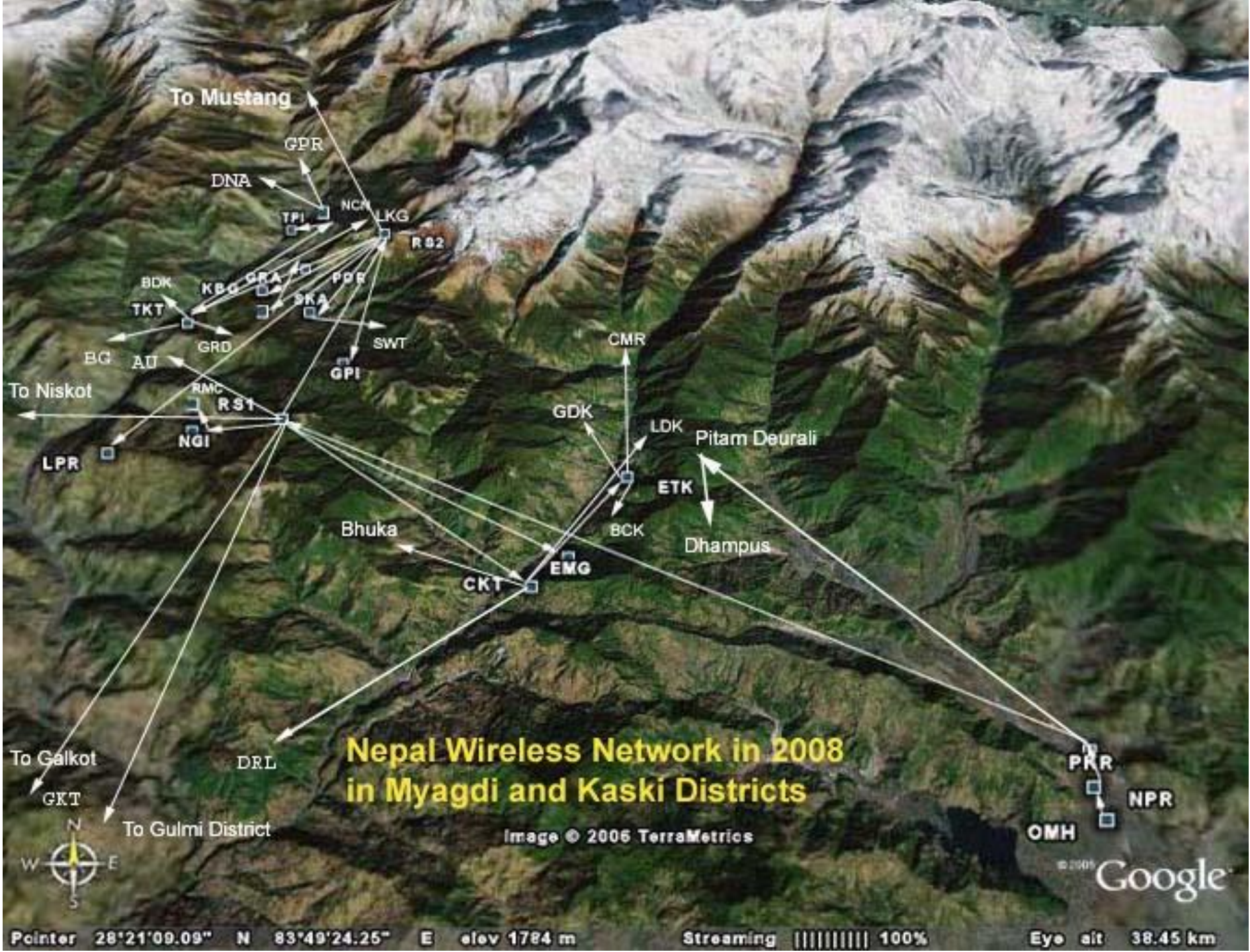
Technology Setup

Nepal Wireless Networking Project
From 2006 - 2011

Power Generation@ Relay Stations

Wireless Receiver in Kagbeni

Project Implementation:
Relay Towers at Dip (1,025m), Mohare (3,320m), Lumpek


To Mustang
GPR
DNA
TPI
NCK
LKG
RS2
BDK
KBG
GRA
PDR
TKT
SKA
GRD
SWT
GPI
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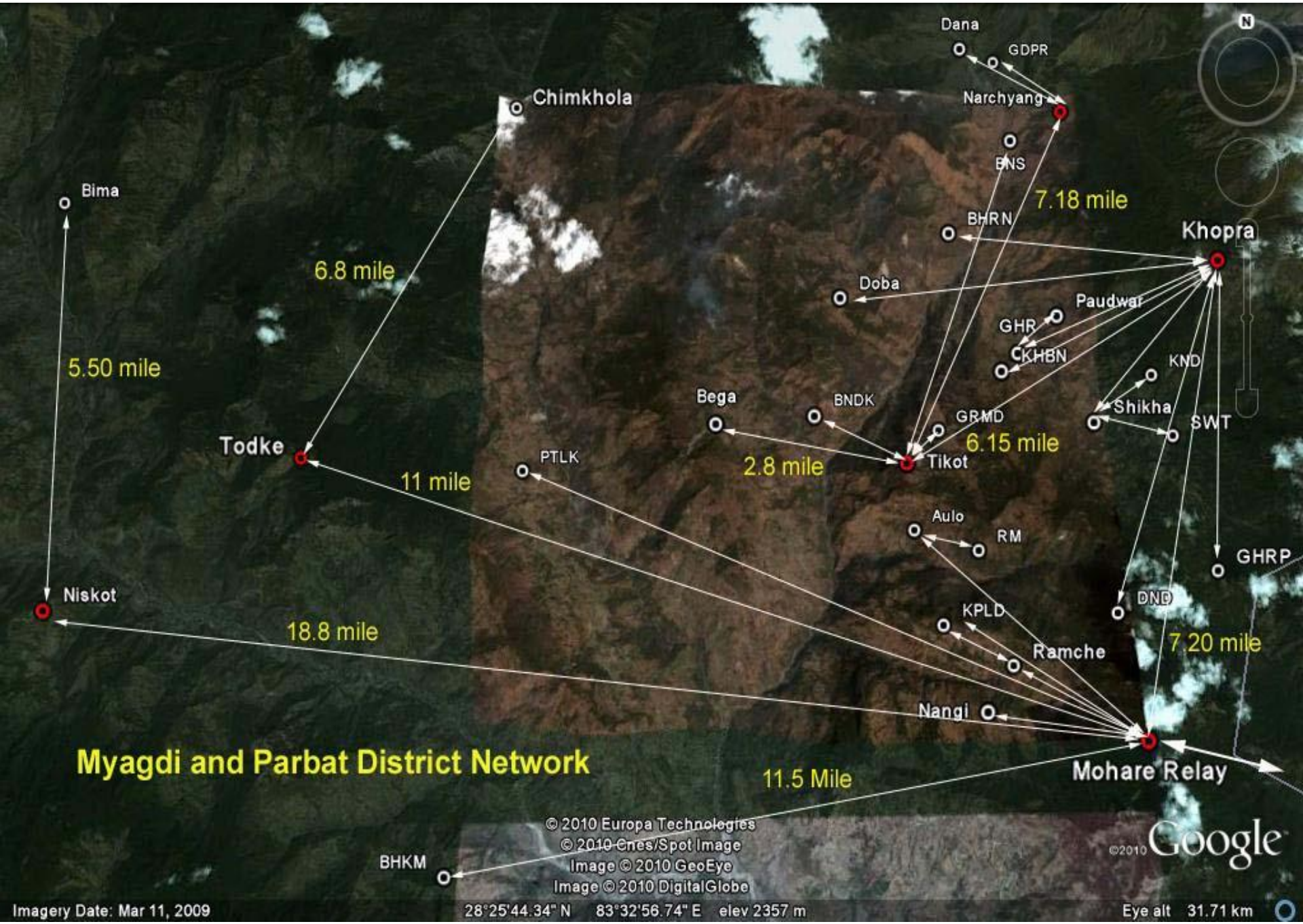
AU
To Niskot
RMC
RS1
NGI
LPR
CMR
GDK
LDK
Pitam Deurali
ETK
BCK
Dhampus
Bhuka
EMG
CKT
DRL
To Galkot
GKT
To Gulmi District
PKR
NPR
OMH
Nepal Wireless Network in 2008
in Myagdi and Kaski Districts
Image © 2006 TerraMetrics
Google
Pointer 28°21'09.09" N 83°49'24.25" E elev 1784 m
Streaming 100%
Eye alt 38.45 km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GDPR
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BNS
7.18 mile
Bima
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Khopra
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KND
5.50 mile
Bega
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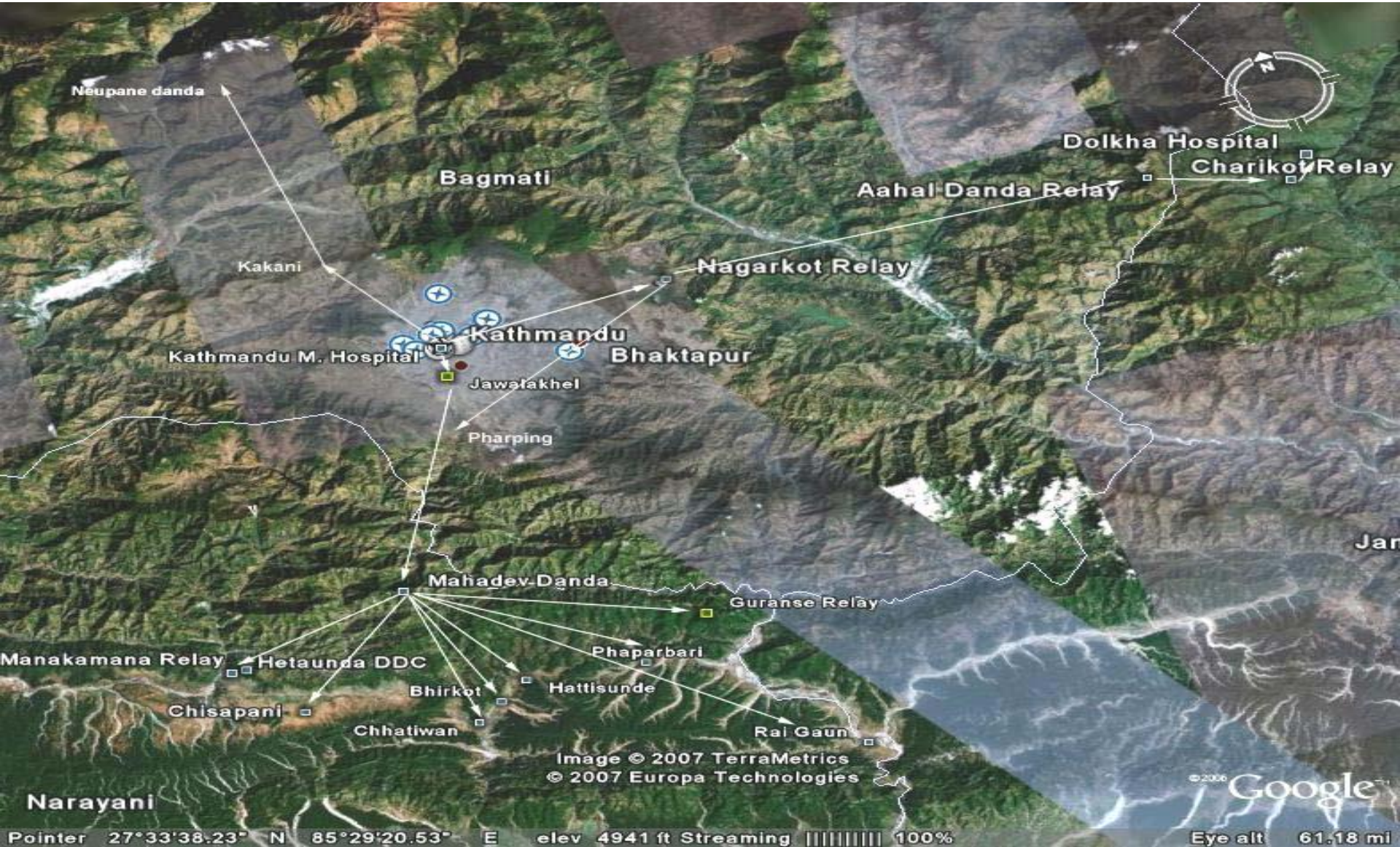
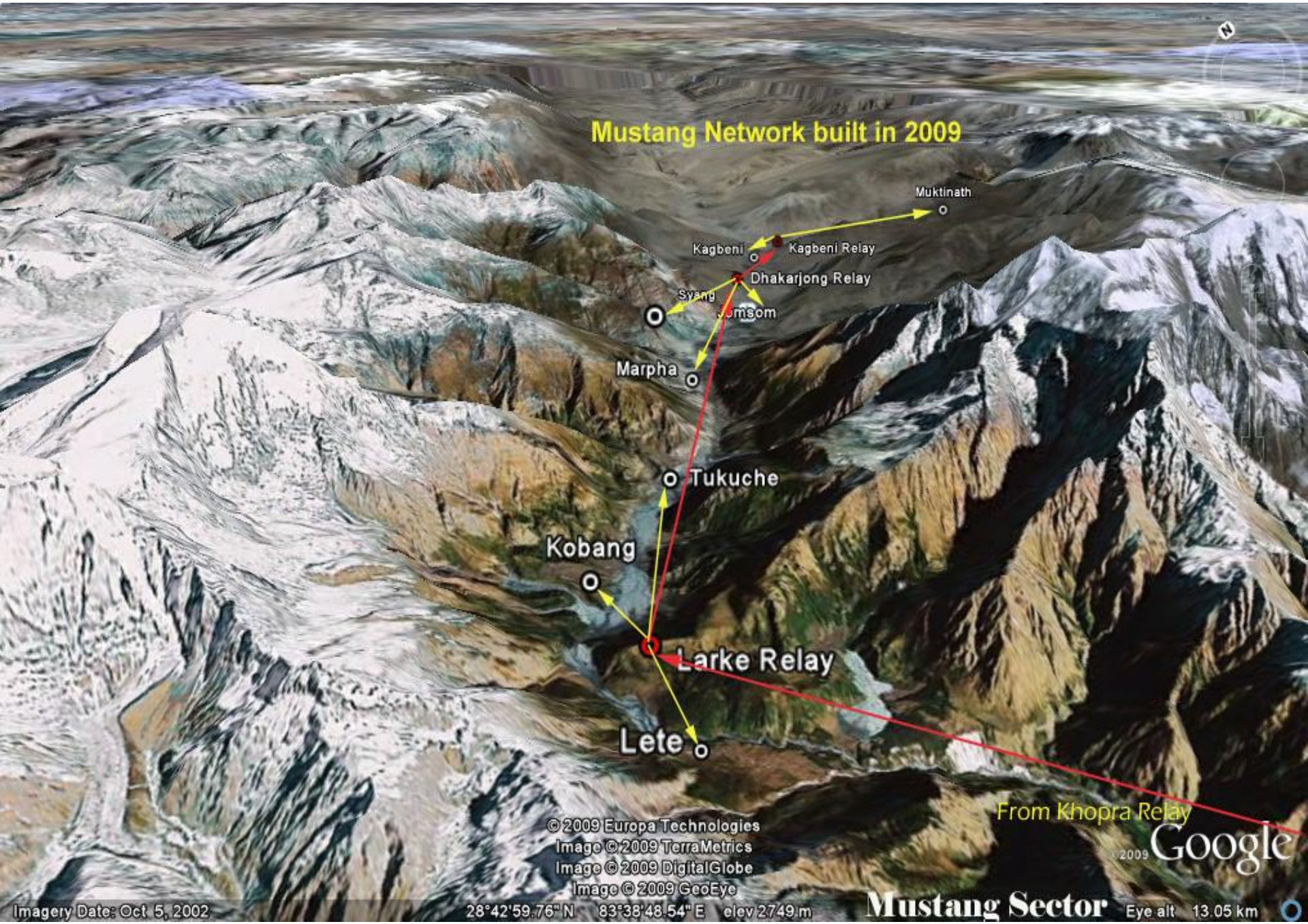
GRMD
Shikha
SWT
6.15 mile
Todke
PTLK
2.8 mile
Tikot
11 mile
Aulo
RM
GHRP
Niskot
DND
KPLD
18.8 mile
Ramche
7.20 mile
Nangi
Myagdi and Parbat District Network
11.5 Mile
Mohare Relay
© 2010 Europa Technologies
© 2010 Cnes/Spot Image
Image © 2010 GeoEye
Image © 2010 DigitalGlobe
BHKM
©2010 Google
Imagery Date: Mar 11, 2009
28°25'44.34" N 83°32'56.74" E elev 2357 m
Eye alt 31.71 km

Assistance in Other Wireless Projects

- Makwanpur – Kathmandu – Dolakha - Nuwakot Network

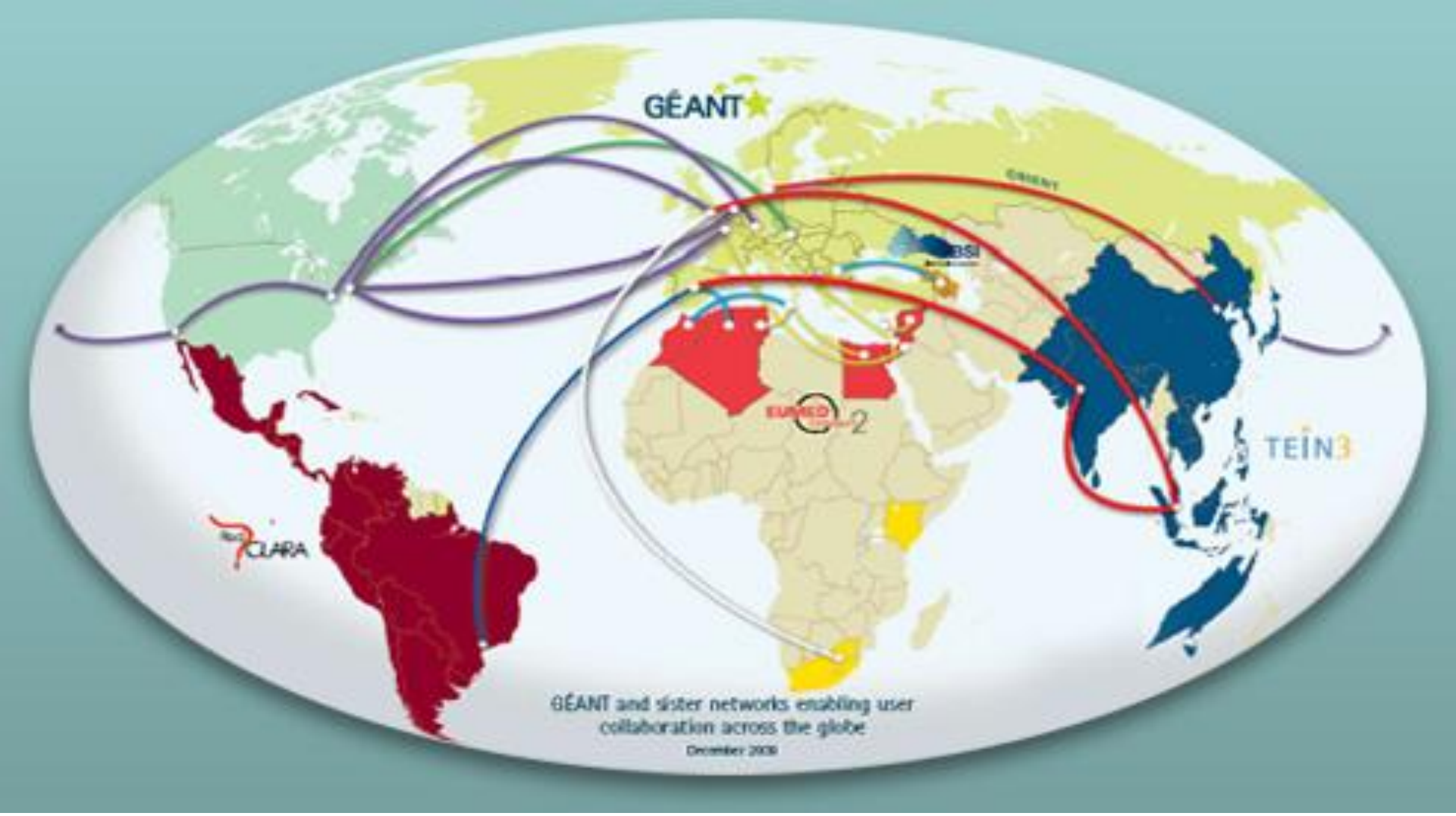



Mustang Network built in 2009
Muktinath
Kagbeni
Kagbeni Relay
Dhakarjong Relay
Syang
Jomsom
Marpha
Tukuche
Kobang
Larke Relay
Lete
From Khopra Relay
© 2009 Europa Technologies
Image © 2009 TerraMetrics
Image © 2009 DigitalGlobe
Image © 2009 GeoEye
Google
Imagery Date: Oct 5, 2002
28°42'59.76" N 83°38'48.54" E elev 2749 m
Mustang Sector
Eye alt 13.05 km

Network Service Area in 2011

- **125 Villages in 13 districts of Nepal**
- **Total Population – About 60,000**
- **Clients – schools, health clinics, hotels, individuals, community centers**

Districts connected to Nepal Wireless - 2011



- **Asia Pacific Advanced Network (APAN):**
- **Trans-Eurasia Information Network(TEIN3):**
- **GÉANT2 network**
- **DANTE Network**
- **Internet 2**

Nepal Research & Education Network

Connection of NREN

Domestic Connection:

1. **Kathmandu University**
2. **Tribhuvan University Central Library**
3. **Institute of Medicine**
4. **Prime College**
5. **Health Net Nepal**
6. **St.Xavier College,**
7. **Gandaki College of Engineering and Sciences**
8. **Khowpa Engineering College**
9. **Advance College of Engineering and Management,**
10. **Kantipur City College**
11. **Nepal Wireless**
12. **Kathmandu Model Hospital**
13. **Nepal Medical Colleges**
14. **Skin Hospital and Research Centre**

Goals of the Project

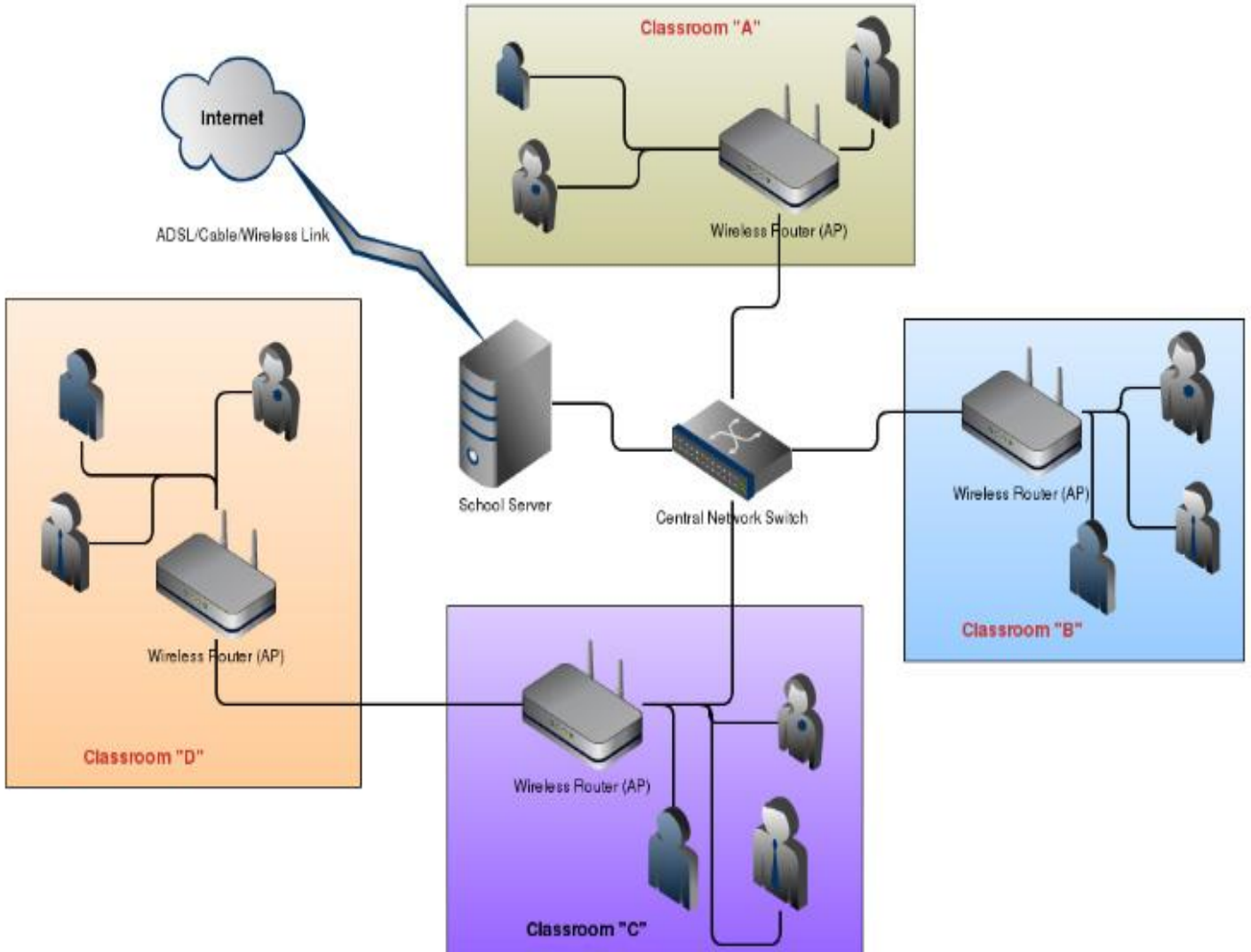
Maximize the benefit of the technology to the rural population.

- **Tele-education and tele-training – Online educational content sharing, video conferencing between teachers and students**
- **Tele-medicine – Medical service through online or offline consultation using the Internet and Intranet**
- **Communication – E-mail, Internet Telephony.**
- **Information share – Webpage, bulletin board, group discussion, research works**
- **E-Business – Internet banking transaction, remittance services etc**

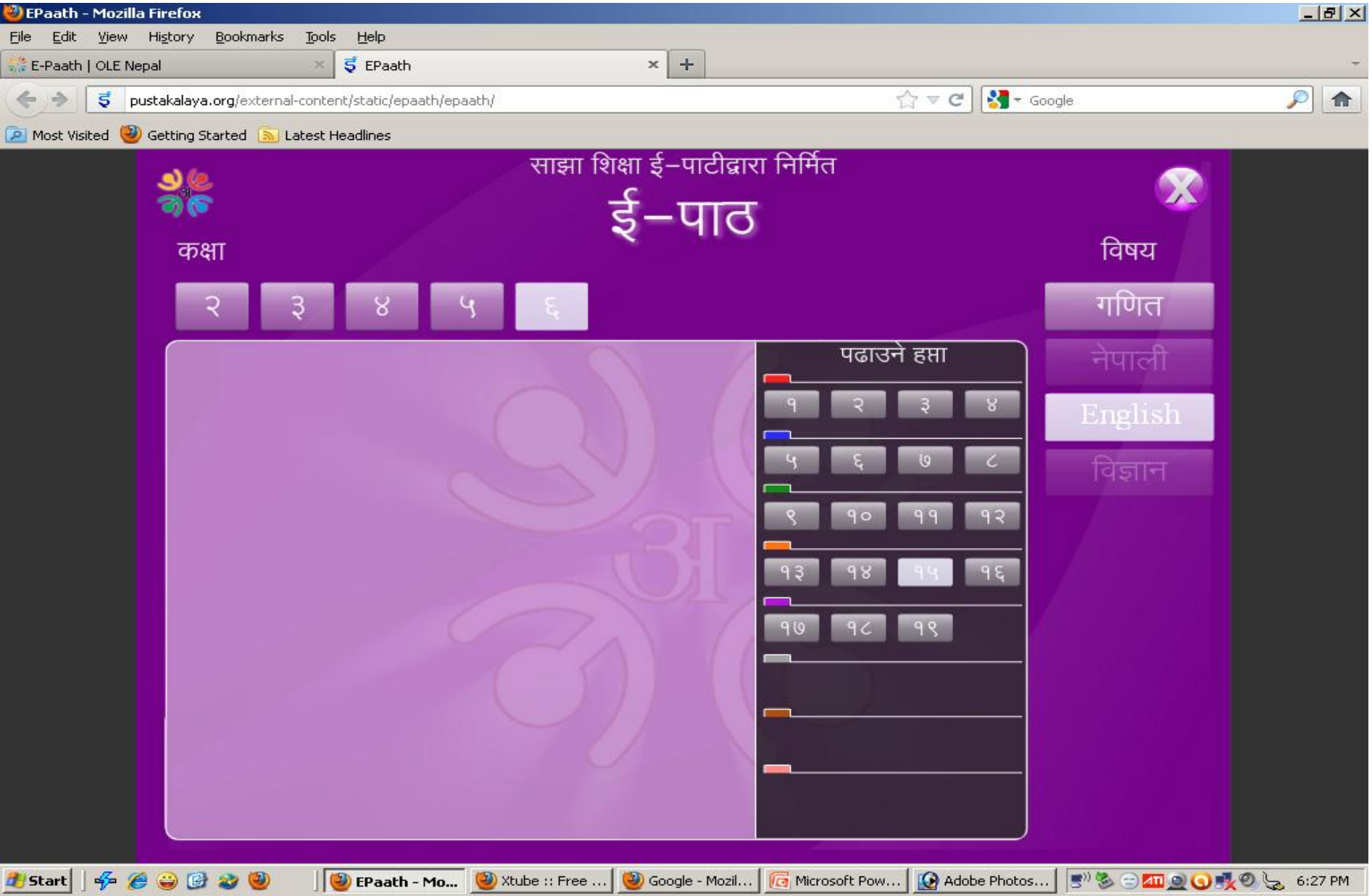
Working with OLE Nepal to develop educational contents for schools in Nepali Language. Over 2,500 OLPC Laptops were distributed with OLE - Nepal in 25 Schools and connected to the network

School Network

The following diagram shows a typical school network implementation:



E-Learning


EPaath - Mozilla Firefox
File Edit View History Bookmarks Tools Help
E-Paath | OLE Nepal
EPaath
pustakalaya.org/external-content/static/epaath/epaath/
Google
Most Visited
Getting Started
Latest Headlines
साझा शिक्षा ई–पाटीद्वारा निर्मित
ई–पाठ
कक्षा
२ ३ ४ ५ ६
विषय
गणित
नेपाली
English
विज्ञान
पढाउने हप्ता
१ २ ३ ४
५ ६ ७ ८
९ १० ११ १२
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१७ १८ १९
Start
EPaath - Mo...
Xtube :: Free ...
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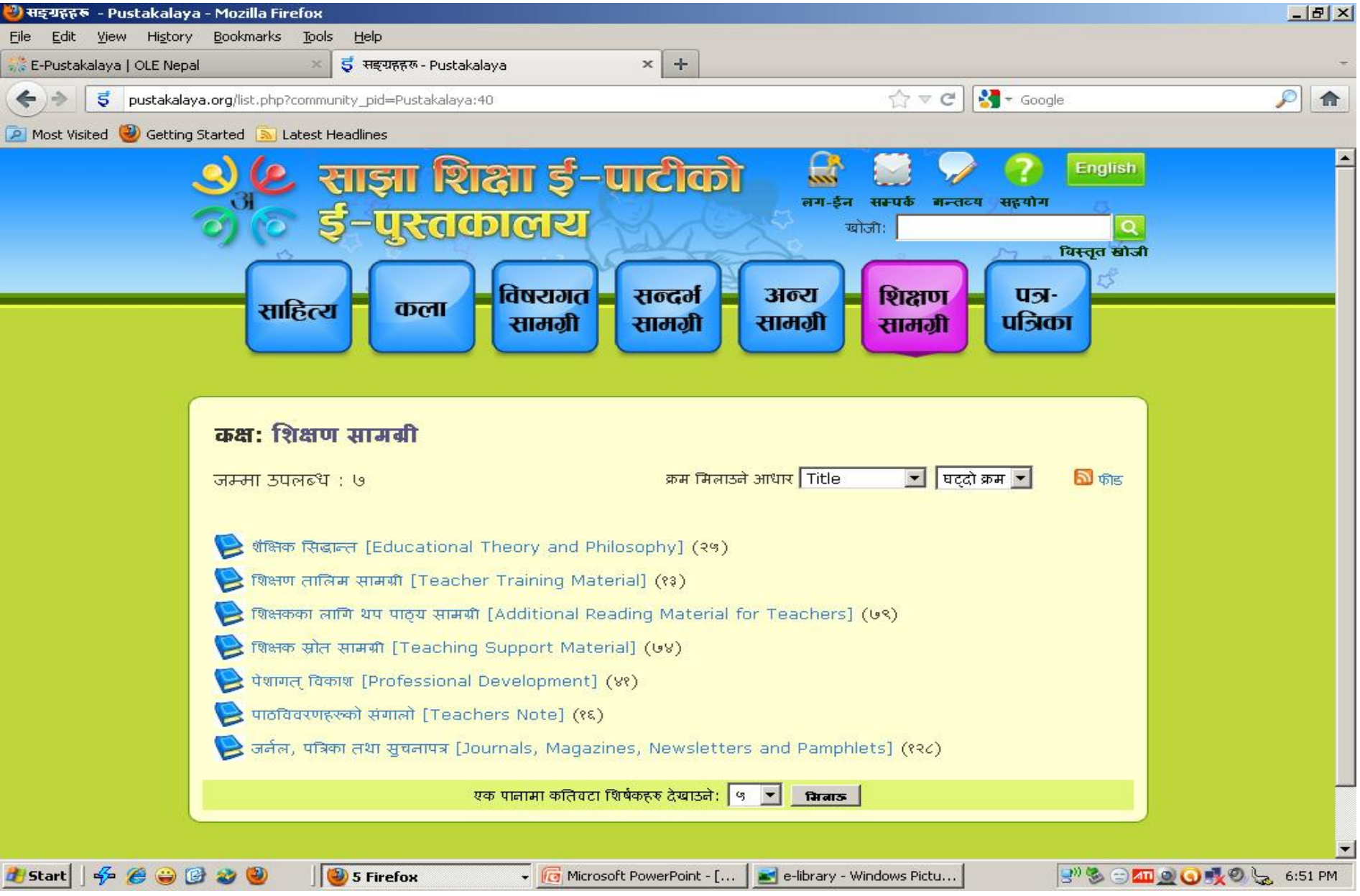
6:27 PM

E-Library


सङ्ग्रहहरू - Pustakalaya - Mozilla Firefox
File Edit View History Bookmarks Tools Help
E-Pustakalaya | OLE Nepal
सङ्ग्रहहरू - Pustakalaya
pustakalaya.org/list.php?community_pid=Pustakalaya:40
Most Visited Getting Started Latest Headlines
साझा शिक्षा ई-पाटीको
ई-पुस्तकालय
English
लग-ईन सम्पर्क मन्तव्य सहयोग
खोजी:
विस्तृत खोजी
साहित्य
कला
विषयगत सामग्री
सन्दर्भ सामग्री
अन्य सामग्री
शिक्षण सामग्री
पत्र-पत्रिका
कक्ष: शिक्षण सामग्री
जम्मा उपलब्ध : ७
क्रम मिलाउने आधार Title
घट्दो क्रम
फीड
शैक्षिक सिद्धान्त [Educational Theory and Philosophy] (२५)
शिक्षण तालिम सामग्री [Teacher Training Material] (१३)
शिक्षकका लागि थप पाठ्य सामग्री [Additional Reading Material for Teachers] (७९)
शिक्षक स्रोत सामग्री [Teaching Support Material] (७४)
पेशागत् विकाश [Professional Development] (४१)
पाठविवरणहरूको संगालो [Teachers Note] (१६)
जर्नल, पत्रिका तथा सुचनापत्र [Journals, Magazines, Newsletters and Pamphlets] (१२८)
एक पानामा कतिवटा शिर्षकहरु देखाउने: ५
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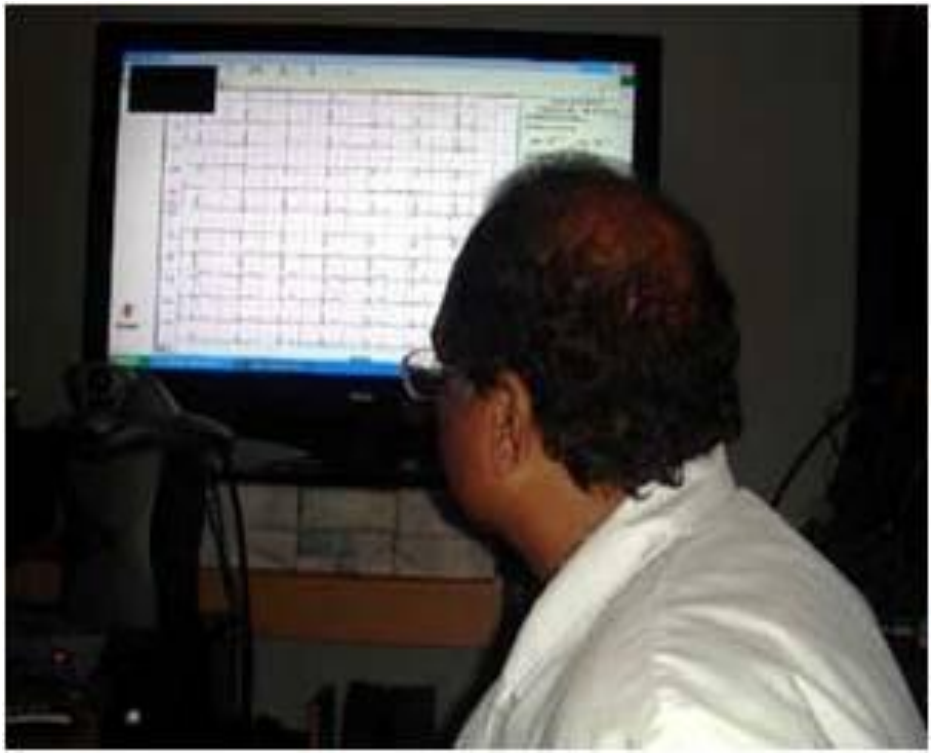
Telemedicine Center in a village

Early Experience with Telemed Gadgets



Training Programs

Wireless Training

Wireless Network Usage

Communication Center

Works Under Progress

- **OpenMeetings video conferencing system**

- **Developing web based mobile application to support pregnant women in rural Nepal**

- **Developing a system to provide air route information system for Civil Aviation and airlines**

OpenMeetings - Mozilla Firefox

File Edit View History Bookmarks Tools Help

OpenMeetings

192.168.126.3:5080/openmeetings/

Most Visited Getting Started Latest Headlines

EXIT Files Actions public Conference Room

Users

sakamoto sakamoto

naresh naresh

Mahabir Pun

Maha Pun

nare:

nare:

sakamoto

sakamoto

Activities and actions

naresh naresh [naresh] : has left the room. [15:13:05]

sakamoto sakamoto [sakamoto] : has left the room. [15:16:55]

...mp

...nbly of Myagdi District committee –has decided to Allocate Nrs. 1,00,000.00 per year for each VDC for the computer education

Most of the hotels in the annpurna region has understand the value of ICT And they come online.

3 Schools has formally started formal computer education class from class 8, 9 and 10

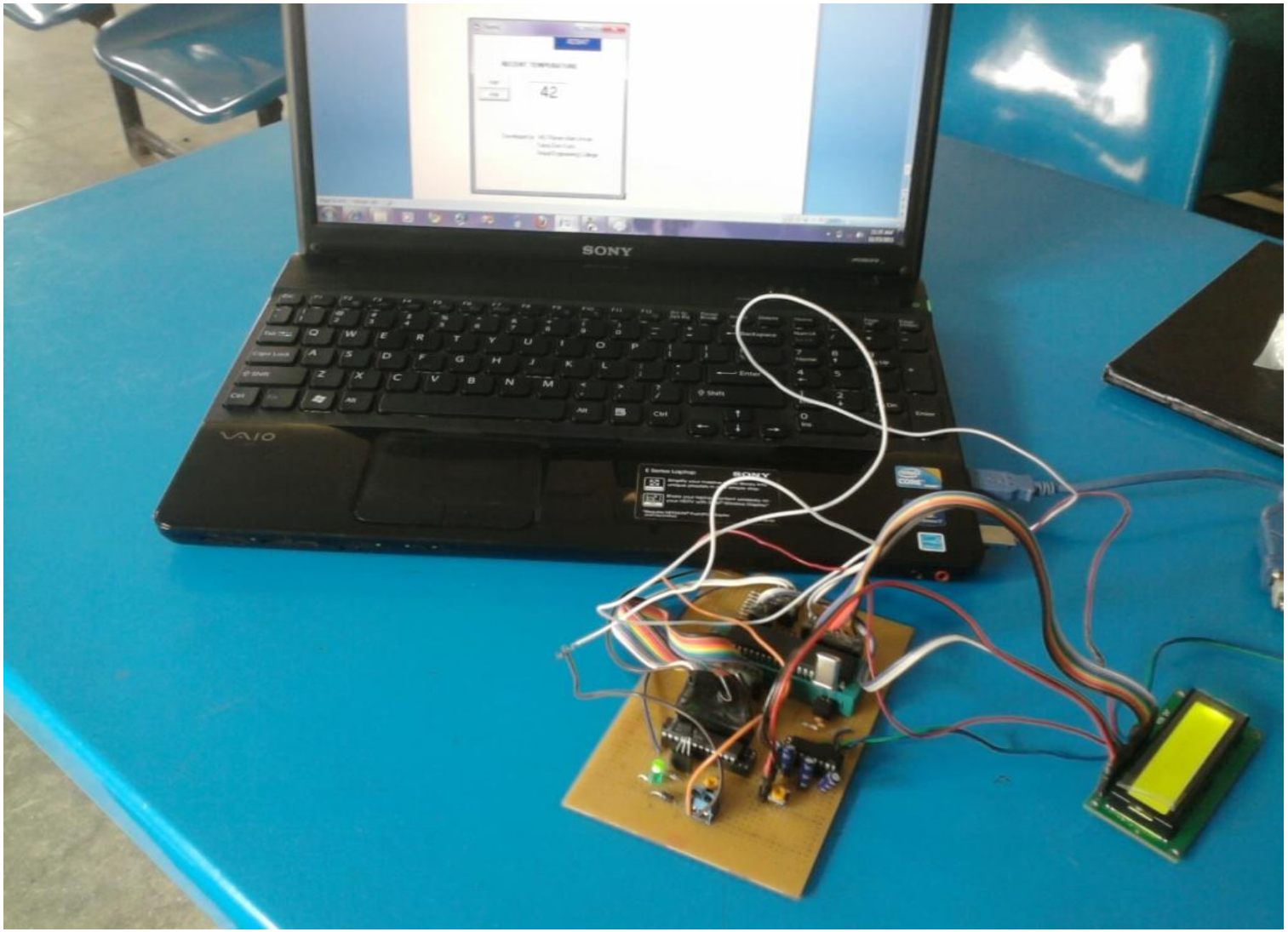
Other neighboring school are in pressure for running computer education class In government schools

Chat

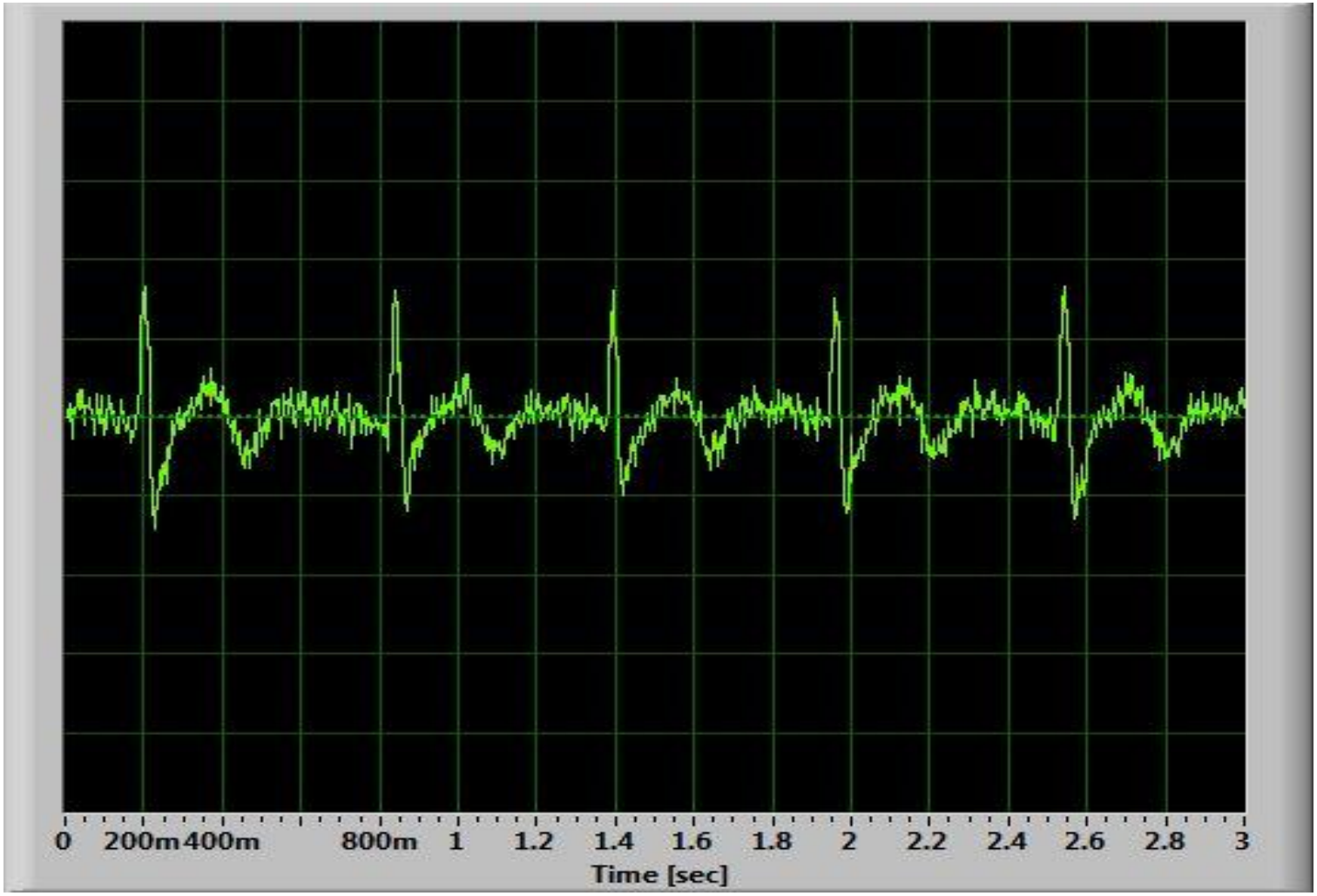
Start Network Conn... QuickCam® 2FinalKhopra&... 2 Firefox Volume Control 3:28 PM

Research & Development Works

Circuit board of ECG

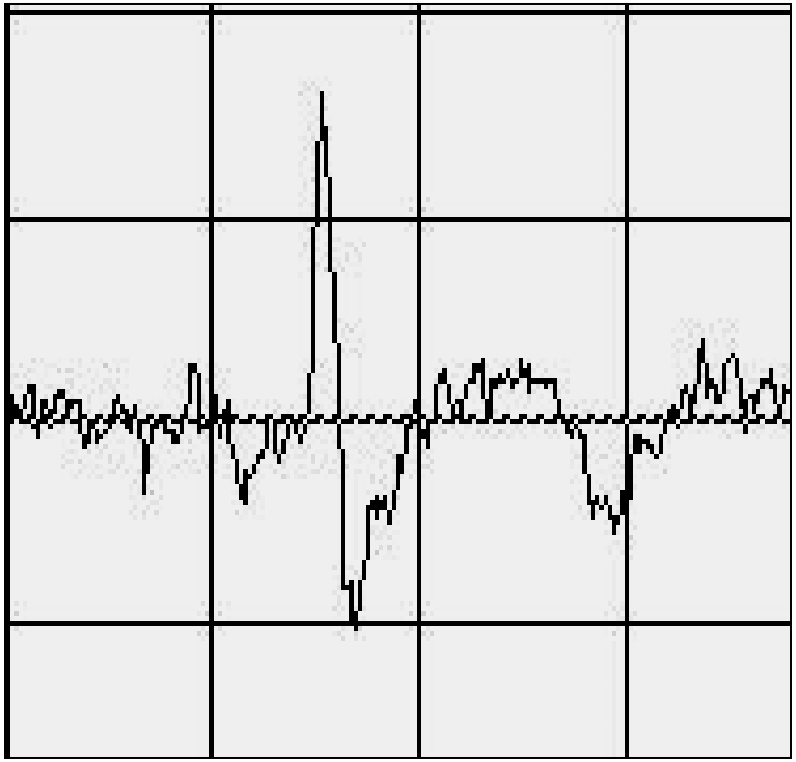


ECG OUTPUT

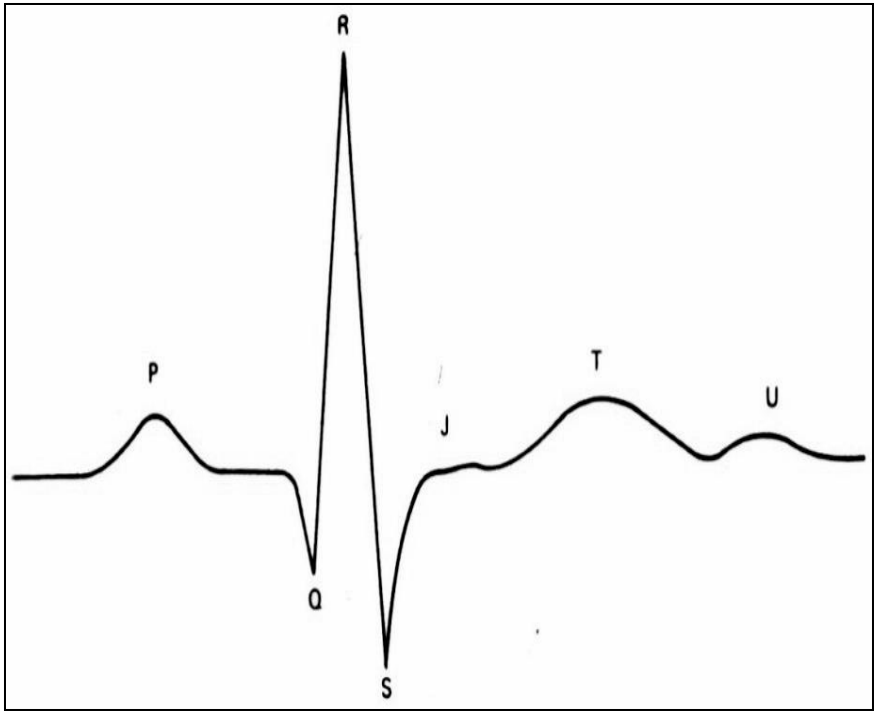


COMPARISON

ECG Output of Our Design



Real ECG Signal [4]



- Interference
- Noise
- Filtering Error

REMOTE SIDE LOGIN

PATIENT RECORD

TELEmedicine

rijsat

Home | Remoteside center | Specialty center | Suggestions From Doctor | Extra....

Patient Record

Patient Name: Ram

Gender: Male

Address: Kalimati, Kathmandu

E-mail: ram_123@yahoo.com

Body Temperature: 36

Blood Pressure: 97-110

Symptoms: weight loss

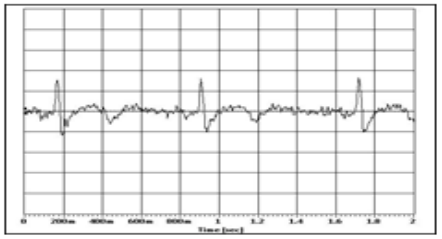
Previous Record: no record

X-ray: H:\solution\telemedicin Browse...

Add Record

Date: 11/15/2011

Date of Birth: 22nd sep, 1987



ECG

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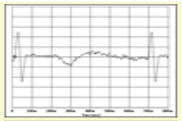
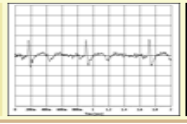
9	puspaa thapa	12th jan	Female	12321	kathmandu	puspaa@yahoo.com	37	88-120	fever	no		
10	Ram	11/15/2011	Male	22nd sep, 1987	Kalimati, Kathmandu	ram_123@yahoo.com		97-110	weight loss	no record		

Using Internet in trekking trails

Annapurnas
To Ghorepani & Ulleri
Mohare
Day 3
Hampal
Lunch
To Ghandruk &ABC
Dandakharka
Day 4
Nangi
Day 2
Naka
Khopra
Day 7
Chhistibung
Day 6
Swanta
Day 5
Trek 2
Trek 1
Trek 3
Dandakateri
Lunch
Banskharka
Day 1
(Homestay)
Beni
Paudwar
Day 8
Trek 4
Tikot
Day 5
(Homestay)
Galeswor
Arrive from Pokhara
Visit Temple and Start Trek
Narchyang
Day 8
(Homestay)
Tatopani
To Pokhara
By Bus
Tiplyang
To Pokhara
By Bus
To Jomsom
By Bus
Image © 2010 DigitalGlobe
© 2010 Google
Image © 2010 GeoEye
©2010 Google

What have we done from 2007 - 2010?

Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://hotelbooking.nepalwireless.net/

Welcome To Nepal Wireless Project | http://hotelbook...palwireless.net/

Welcome To Nepal Wireless Project

HOTEL BOOKING

Home | Hotel Booking | Trekking Route Maps | Contact Us | Site Feedback

Easy and Secure way for Hotel booking in Mustang Region of Nepal

Mustang District Hotels

Hotel Yeti

Hotel Blue Star

Hotel Mustang Gateway

Hotel Xanadu

Nepal Community Eco - Lodge Treks

Khopra Community Lodge

Dandakharka Community Lodge

Chhistibung Community Lodge

Our Promise to You

Price Match Guarantee

Price Match Guarantee If you find a cheaper rate,

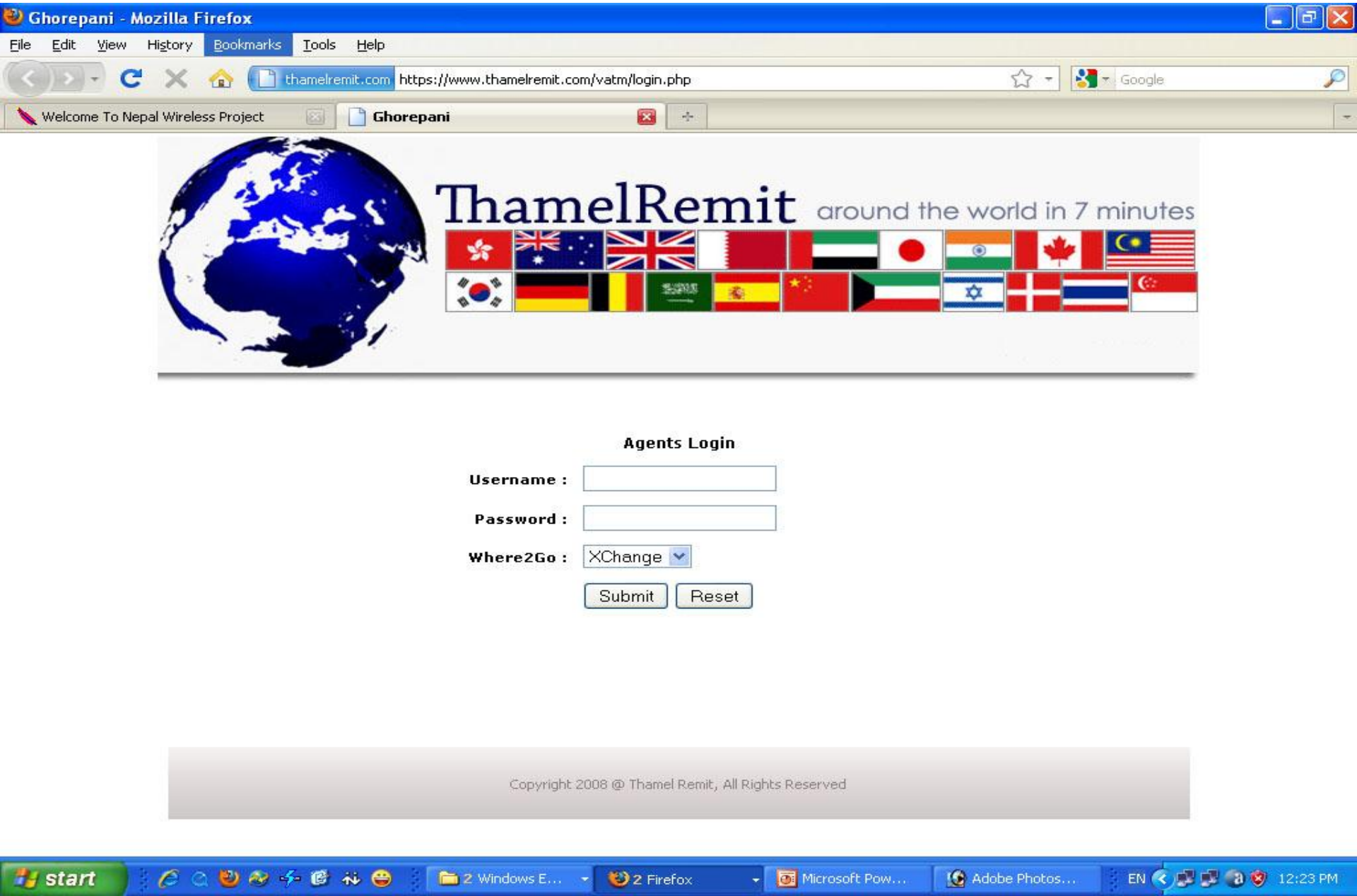
Secure Booking Online

We use SSL encryption technology to ensure

Destination Nepal

start | Mozilla Firefox | Adobe Photoshop | EN | 8:43 PM

Virtual ATM


Ghorepani - Mozilla Firefox
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thamelremit.com https://www.thamelremit.com/vatm/login.php
Google
Welcome To Nepal Wireless Project
Ghorepani
ThamelRemit
around the world in 7 minutes
Agents Login
Username :
Password :
Where2Go :
XChange
Submit
Reset
Copyright 2008 @ Thamel Remit, All Rights Reserved
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Adobe Photos...
EN
12:23 PM

Opening a Restaurant in Thamel

Weather Station at Khopra (3,650m) with Asian Institute of Technology Bangkok

Future Program

- Health Assistant Teaching (Three years after 10th grade)
- Working with the Government to get permission
- Start a college by 2015

Source of funding ?????

The Universal Declaration of Human Rights (*December 1948)*

"Everyone has the right to a standard of living adequate for the health and well being of himself and his family, including food, clothing, housing and medical care and necessary social services.... "

Continued in article 23:

" Everybody has the right of equal access to public service…."

Continued in article 26:

" Everybody has the right to education."

Source: Universal Declaration of Human Rights, 1948, http://www.un.org/Overview/rights.html

mahabir@himanchal.org
Mobile: 9841592361

For More Information

Please Visit:

http://www.himanchal.org

http://www.nepalwireless.net

http://www.olenepal.org

http://www.enrd.org

http://nren.org.np

THANK YOU