Nepal Wireless Networking Project

Rural Telecommunications Final Report

Ragil Putro Wicaksono

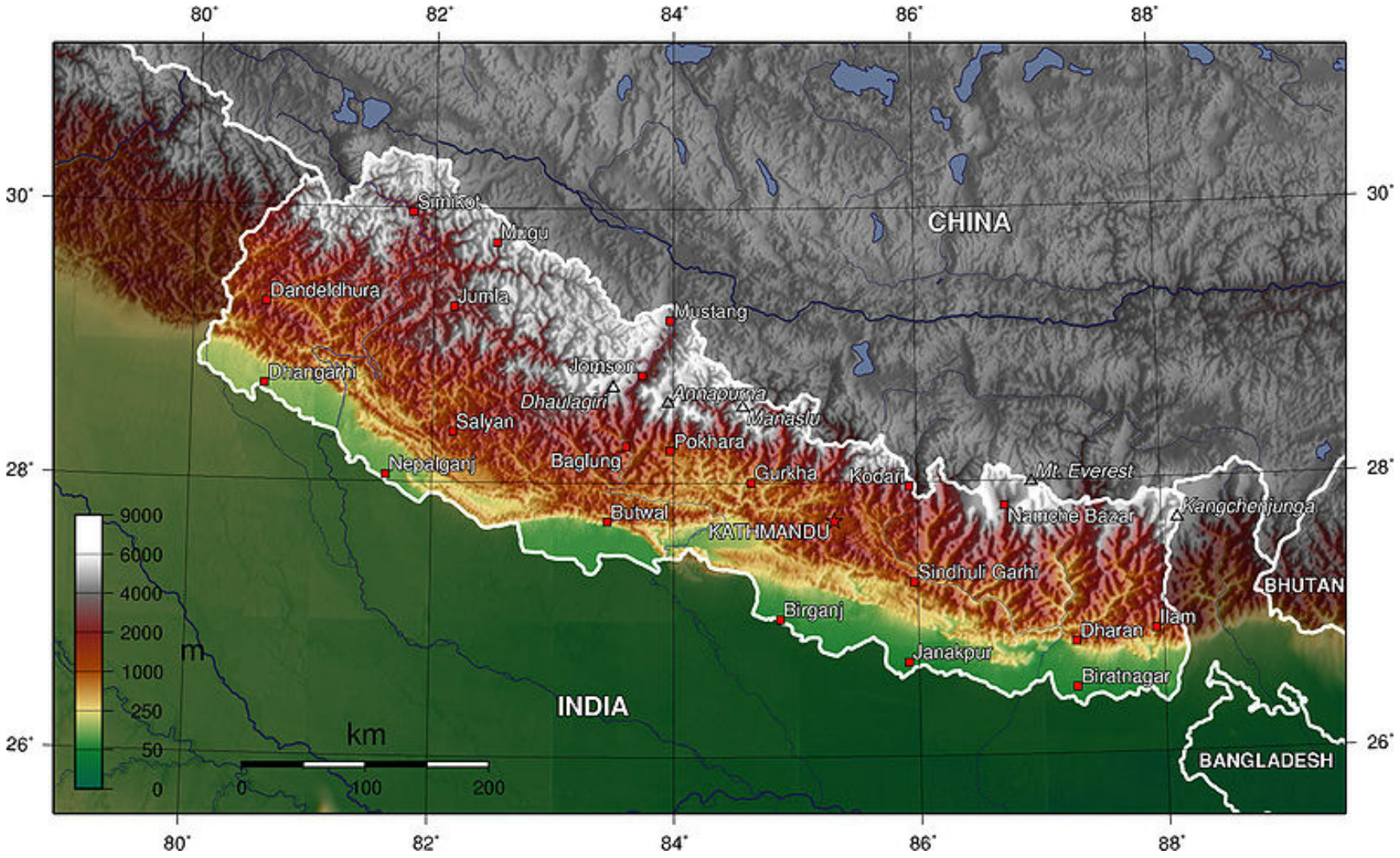
09M51353

Background

- Nepal:
  - Population of 29Mil people across 150km^2 area.
    - There are 8,000 villages with more than 15 million people living in rural areas.
  - Geographical Barrier @ Himalayan Areas.
  - Ranked 115th Nominal GDP listed by IMF.

  - For most of the Nepalese villagers a computer is no more than a "mysterious box".
    They have no idea what Internet is.

Nepal Geographical Condition



Mahabir Pun

- Nepalese teacher.
- Helping a setup of a high-school in his hometown.
- Applying wireless technologies to develop remote areas of the Himalayas.

- Given Overall Social Innovations Award for 2004 by the Global Ideas Bank
- Awarded the Magsaysay Award in 2007
  - Which is considered by some to be the Nobel Prize of Asia
- Invited by University of Nebraska, for winter commencement speech and awarded Honorary Degree, Doctor of Humane Letters in December 2007

"My dream a long time ago to go to a university was shattered due to financial restraints, and this created another dream to provide educational opportunities for the rural children so that they should not have to go through all the pain and struggle I went through"

Project Development

- 1997: Himanchal High School got 4 used computers, but with no phone lines available.
- 2001-02: BBC article, introduced to 802.11b. 1st connection test between two villages, ~1.5km established.
- 2003: March, 2nd testing, to ISP available city ~40km.

Project Status

- End of 2003: connect 5 villages of Myagdi district.
- 2004: connect 7 villages.
- 2006: connect 13 villages.
- Current: 22 villages of Myagdi, Kaski and Parbat district.
  - Also helped to build a similar wireless network in other district connecting total 11 villages .
  - Approximate population of 60,000.
  - 20 High Schools with about 4,500 Students.

Technology Used: Wi-Fi

- The cheapest technology available in the market.
- Easier technology and they found that anybody could learn to set it up.
- Uses very little power and can run on solar power in the mountains.
- Operation and maintenance cost for the network was minimal.

Example of Equipment Used

- 2001:
  - PCI Wi-Fi wireless cards and home made antenna.
- 2003:
  - 12 smartBridges Air Point Pro Access Points.
  - 14 Pacific Wireless 24 dB Directional Antennas.
  - 14 lightening arrestors for the access points.
  - 2 120W Solar Panels and Voltage Regulators.
  - 2 400W Air-403 Wind Generators.
  - 3 75 Amp-Hour Trojan Deep Cycle Gel Batteries.

Goals

- Bringing in the computers and connecting them is not enough:
  - Develop educational contents in Nepali language.
    - Open Learning exchanges - http://www.olenepal.org/
    - Tele-teaching program.
  - e-health: establish a tele-hospital in urban area and link it to the district hospitals and rural health centers.
  - local e-commerce: Trading of villagers products in the local market through local intranet.
  - Internet phone.
  - Job Creation.

Challenges and Problems

- Financial and technical supports.
  - Projects starts with $0.
  - It's difficult to get adequate devices.
- Before April 2006 the political situation in Nepal is not good – safety.
  - Minimum governmental support
- Natural Barrier
  - Pointing antenna for backbone.
  - Power source.

Business Model

- Exisiting Revenue Streams of the village centers for sustainability
  - Internet usage fee on hourly basis.
  - Monthly fee to the teachers and students.
  - Telephone call fees.
  - Photocopying, photo printing etc. fees.
  - Remittance service fees .
  - Computer training fees in some villages.
- Revenue Streams for the project
  - ~10% to 15% additional charges for the tele-centers telephone bill.
  - Monthly fee to the rural tele-centers for Internet connectivity; current charges range between $10 to $25 per month per village.
  - Remittance and credit card transaction services fees.

Pictures

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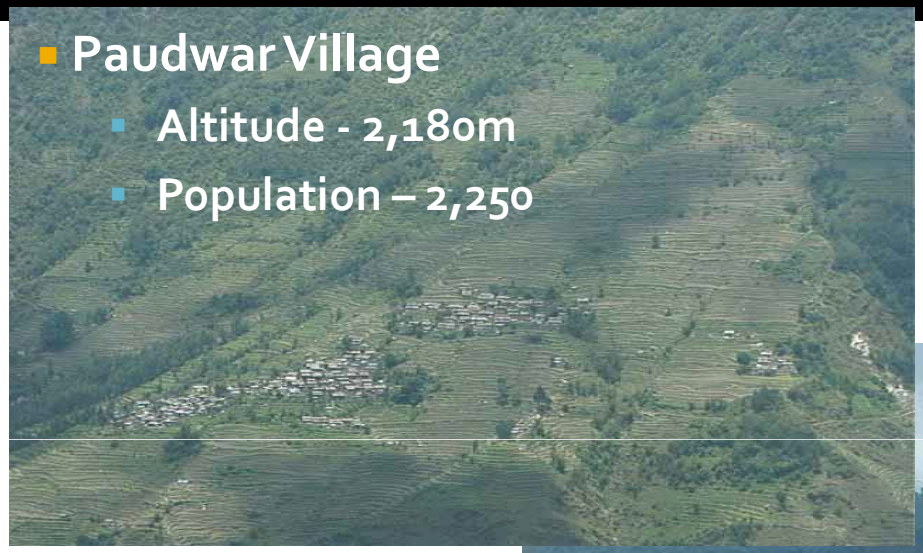
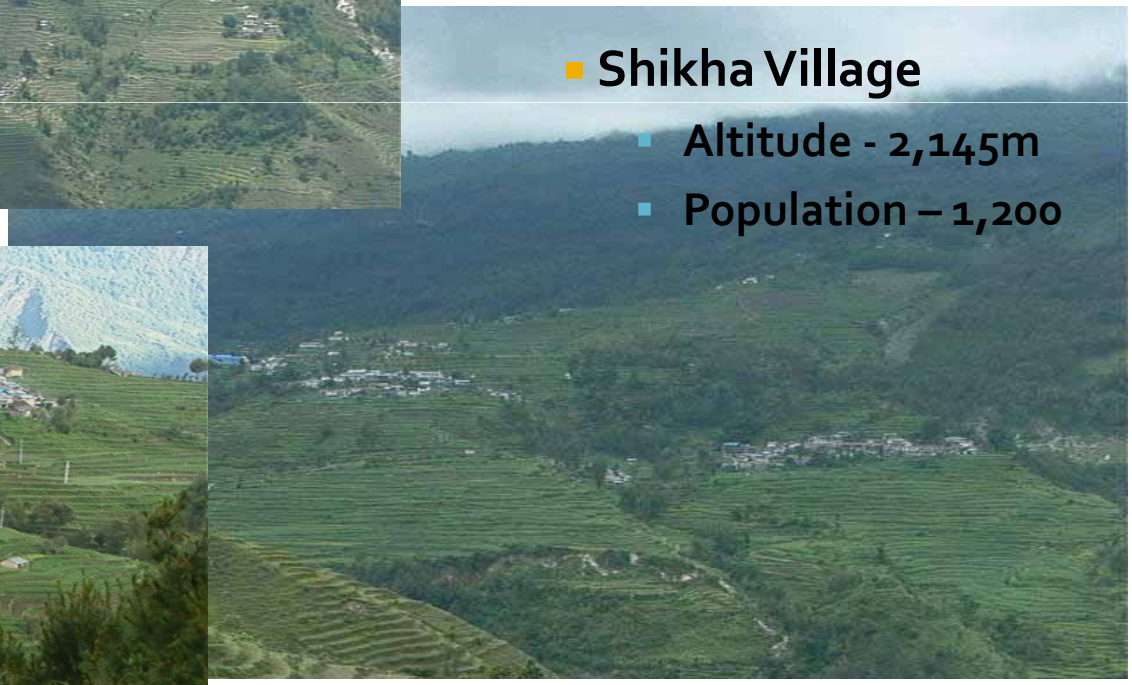
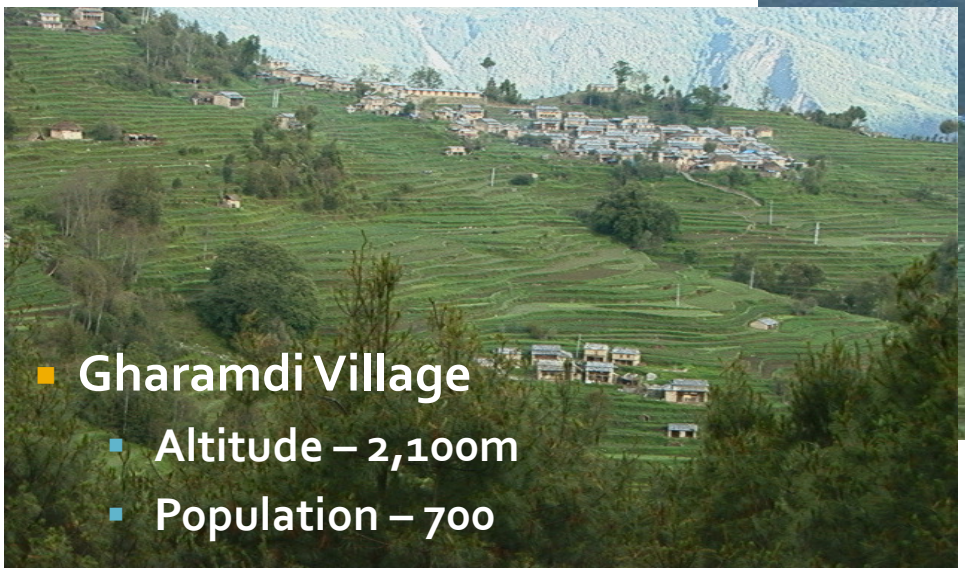


- Paudwar Village
  - Altitude - 2,180m
  - Population – 2,250



- Shikha Village
  - Altitude - 2,145m
  - Population – 1,200



- Gharamdi Village
  - Altitude – 2,100m
  - Population – 700

Pictures

Next Step

- One dollar a month program:
  - Build 4 major relay stations.
  - Build about 8 regional base stations and a central control station with servers to monitor and maintain the network and provide connectivity to rural schools, local governments and businesses.
  - Connect network to government and private hospitals to provide telemedicine service.
  - Encourage local entrepreneurs to become rural Internet service provider.

Summary

- Communication Technology is only a medium choice.
  - Computer and Operating and Maintenance/Training.
- The more important part is to localized it's content/ application based on requirements and introduce it to the community.
- Rural telecommunication won't give good benefit on business side. Social/voluntary side are required

Reference

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