Disaster Telecommunication Networks in Nepal An Assessment with Special Reference to Kathmandu Valley

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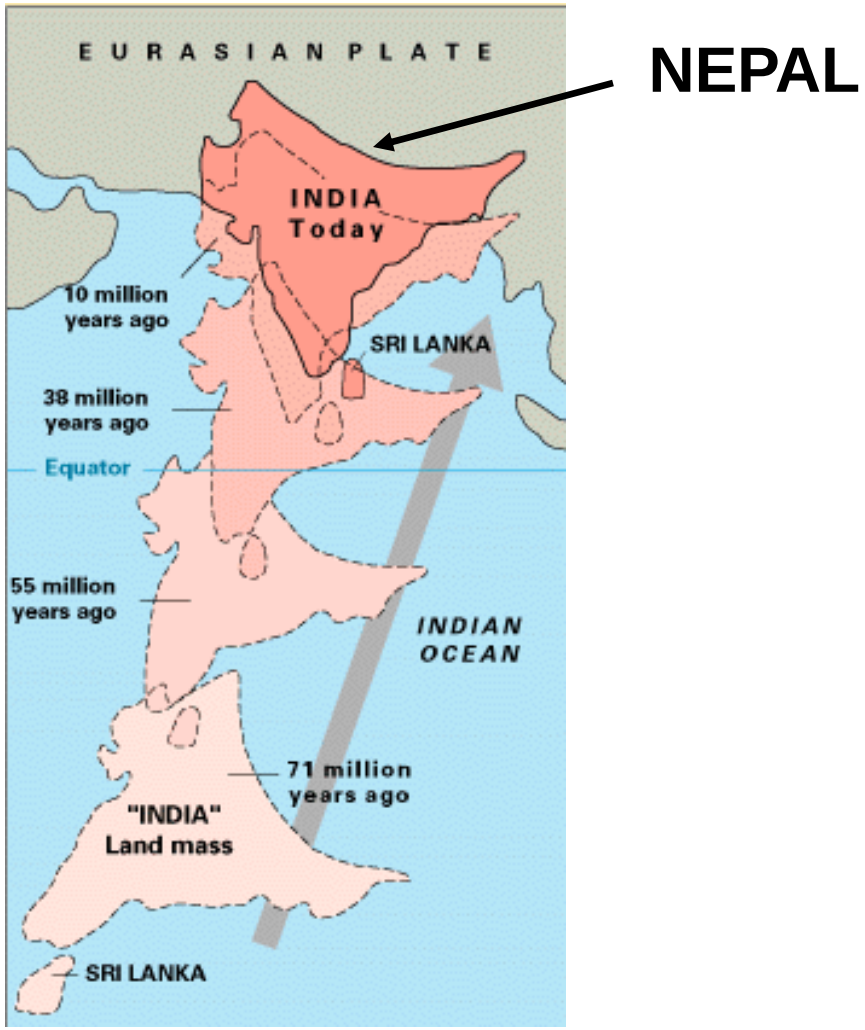
Nepal Was Created by Earthquakes



USGS Website

Direct Losses Due to Earthquakes 1970-2003

Item	Number	Value of direct losses (NR)
Total number of events	**22**	
Death	876	
Injury	6,840	
Affected	4,539	
Buildings Destroyed	33,706	8,200,838,000
Buildings Damaged	55,234	1,309,606,450
Livestock death	2,215	11,075,000
Total loss at present value (NR)		9,566,605,507
Average loss per year due to earthquake		289,897,136

NSDRM Report 2008

Average Annual Loss due to Earthquakes Occurring Within a 33 Year Span, ~$4.14 Billion US

Disaster Losses in Nepal 1971-2006

S. No.	Events	Death	Injury	Peoples Affected	Buildings destroyed	Buildings damaged	Land Loss (Ha)	Livestock Death	Reported Direct Loss (Million NRs)
1	DROUGHT	1	-	1,512	-	-	329,332	-	10
2	EARTHQUAKE	873	6,842	4,539	33,710	63	-	2,257	22.8337+50
3	EPIDEMIC	15,529	37,773	323,896	-	-	1	78	0
4	FIRE	1,081	735	218,128	62,634	2,762	352	113,922	6,244
5	FLOOD	2,864	349	3,315,781	70,115	1,041	196,955	31,117	3,713
6	FOREST FIRE	24	13	10,178	1,698	18	3,173	82	1,031
7	LANDSLIDE	3,899	1,188	480,069	16,779	1,209	21,797	9,046	835
8	OTHER	2,385	2,670	360,725	3,917	388	290,323	79,935	2,030
	TOTAL	**26,656**	**49,570**	**4,715,828**	**188,875**	**5,482**	**841,954**	**236,459**	**13,885**

Notes:
1 Epidemics means peoples seriously affected, hospitalized etc by epidemic events
2 The number "0" does not mean that the events were not occurred, it does mean the event is not reported.

NSDRM Report 2008

- Monitoring from Last 37 Years Shows
  - Earthquake is Not Greatest Disaster in Terms of Lives Lost
  - Absolutely is the Largest in Terms of Economic Impact
- Urban Places Like Kathmandu Valley Pose Serious Problems
  - Size, Economic, Social and Political Importance

Nepal's Routine Disasters

- Tarai Region
  - Prone to Floods and Fires
- Middle Hill Region
  - Landslides
- Kathmandu and Many Other Parts
  - Earthquake

Kathmandu Valley (KV) Vulnerability

- Importance of Kathmandu Valley:
  - Huge Population
  - Seat of Government
  - Concentration of Nation's Manufacturing and Service Industries
  - Contains Only International Airport, Gateway of Tourism
  - High Density of Cultural Heritage Sites

- In Past 30 Years KV has Been Expanding
  - Extensively
  - With Little Planning
  - Little Disaster Preparedness
  - Construction Standards are Poor, Dangerous

Kathmandu Valley Vulnerability

- Kathmandu Sits On a Highly Active Seismic Zone
  - ~8.0 Quake Every ~75 Years
  - It Has Been 74 Years Since Last ~8.0 Quake
- Present Population of Kathmandu May be as High as 6 Million People

Kathmandu Valley Vulnerability

- Extensive Construction of Brick and Mortar Buildings

- Some Experts Believe Conservative Casualty Estimates are Much Higher than Recent Sichuan Quake
  - Sichuan Quake Casualties ~70,000
  - Kathmandu Valley Projected Casualties for ~8.0 Quake >300,000*

Why Are Telecommunication Networks Necessary?

- Telecommunication Networks Save Lives
  - Allow Government Organizations and Others to Efficiently Plan for a Disaster
  - Can Provide Early Warning of Disasters
  - Allow First Responders to be Deployed Optimally, Search and Rescue, fire department etc.
  - Allow Survivors to Inform Rescuers of their Location
  - Allow for Quickest Delivery of Relief Supplies
  - The Central Nervous System of Any Preparedness, Search and Rescue, or Re-supply Effort

Commercial Telecommunication Systems in Nepal

- Land Line Telephony
  - Copper Wires to the home 500,000
- Cellular Service
  - GSM Mobile Phones 450,000
- Wireless Local Loop (CDMA) 60,000
- “Most of Rural and Remote Parts of Nepal are Out of Telecom Services”

Biswa Nath Dhakal, Telecommunications and Disaster Relief Country Report 2006

Why is a **Disaster** Communications Network Necessary?

- Commercial Communications May not Work or Be clogged in an Emergency
- When Electrical Power Goes Out, or Cell Phone Towers Fall, Commercial Communication Will Not Function
- First Responders Need Redundant systems, Can Not Rely only on Commercial, or even Single Providers, or Systems Powered Only by the Electrical Grid
- First Responders Can Have Different Requirements than in Commercial Communications
  - Broadcast As well As Two Way Communication
  - Data Transfer As Well As Voice
  - Information Can be Sensitive and Might Require Limited Access

What is the State of Telecommunication Preparedness for KV?

- "The Vulnerability of Communication Systems such as telephony (landline and cellular) is believed to be high"
  - NSDRM Report 2008

- Police and Military Have a Radio System
  - Unclear Whether Sufficient Capacity Exists for Needs of Today's Kathmandu Valley During an Emergency
  - Both Have Troubled Recent History with the Civilian Population
  - Unclear Whether Civilian First Responders (Hospitals, Red Cross) Would Have Access to This System

What is the State of Telecommunication Preparedness for KV?

- There is No Standardized Robust Communication System That Can Be Used During Preparedness and Emergencies
    - NSDRM Report 2008

- The Interoperability of Existing Communication Systems between the Following is Unclear
  - Police
  - Military
  - Fire Department
  - Hospitals
  - Red Cross and Other Private First Responders

- Nepal Red Cross' Preparedness
  - 30 Walkie Talkies with 15KM Range for Entire Country, A Handful of GPS Locators
  - One Satellite Phone
  - Hardly Any Connectivity Throughout the Country

  - Audit Performed by S.P. Ojha Oct 10, 2007
- **THIS IS UNACCEPTABLE!!!!**

What Can We Do?

- A Lot is Already Happening on Preparedness In Nepal
- GON and Others Aware and Open to Issues of Disaster Telecommunication Networks
  - But Political Transitions and Economic Difficulties (Caused by Maoist Insurgency) have presented challenges
- Specifically Nepal Requires:
  - Scientific, Technical and Management Advice
  - Equipment and Training
  - Maximum Utilization of Indigenous Skills and experts
- What Does America Do? Is A Common Question

What Else Can We Do?

- CAN-USA Can and Will Make Specific Efforts to Enhance Nepal Red Cross' Telecommunication Capabilities
- Insist All Major Hospitals In KV Have Disaster Telecommunication Capabilities
- Encourage Connectivity Efforts to Incorporate Amateur Radios and Radio Repeater Stations Alongside Their Primary Efforts
  - Himanchal Education Foundation
  - Telecenter Development
- Incorporate All Recommendations of NSDRM Report 2008 as it relates to Telecommunication
- Encourage Opportunities to Share Infrastructure Needs and Experiences With Other Similar Municipalities