

GLOBAL PLATFORM ON DRR, 5-7 JUNE, GENEVA

Session 4.2.1 (6 June 2007): WORKSHOP ON

RISK REDUCTION IN THE HEALTH SECTOR

Disaster Risk Management in Health Sector: Experiences of Nepal

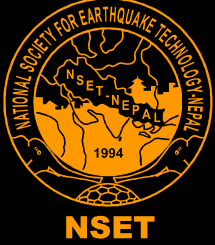


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Amod M. Dixit

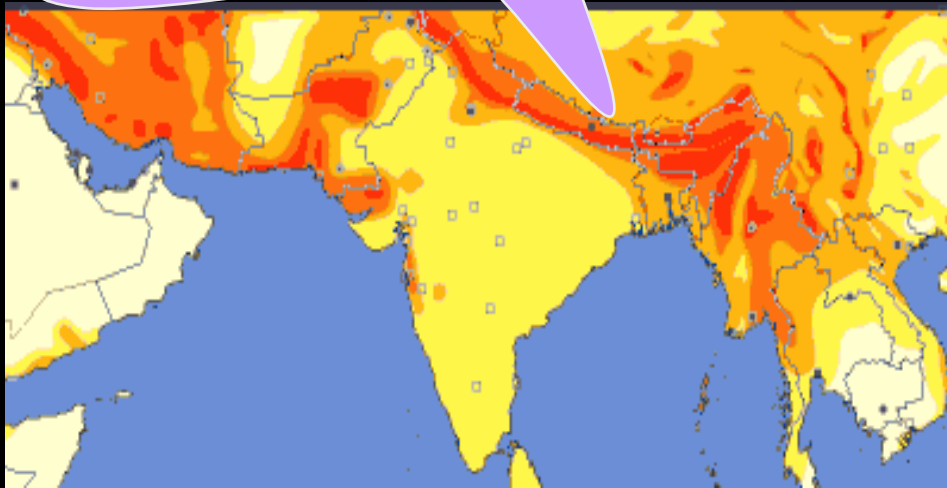
Executive Director

National Society for Earthquake
Technology – Nepal (NSET)



Earthquake Hazard and Vulnerability of Nepal

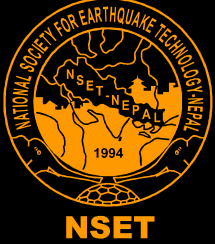
We live in
High Seismic
Hazard Zone



Source: Munich Re

We have
created huge
vulnerabilities





Potential Impact due to scenario EQ in KV

(KVERMP estimates for IX MMI)

Impact

Death

Injuries

Buildings destroyed/collapsed

Homeless population

Lifelines damaged

Hospitals in regions of MMI IX

Extent

>40,000

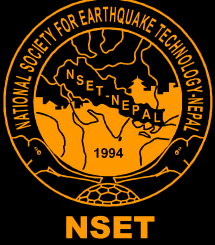
>95,00

>60%

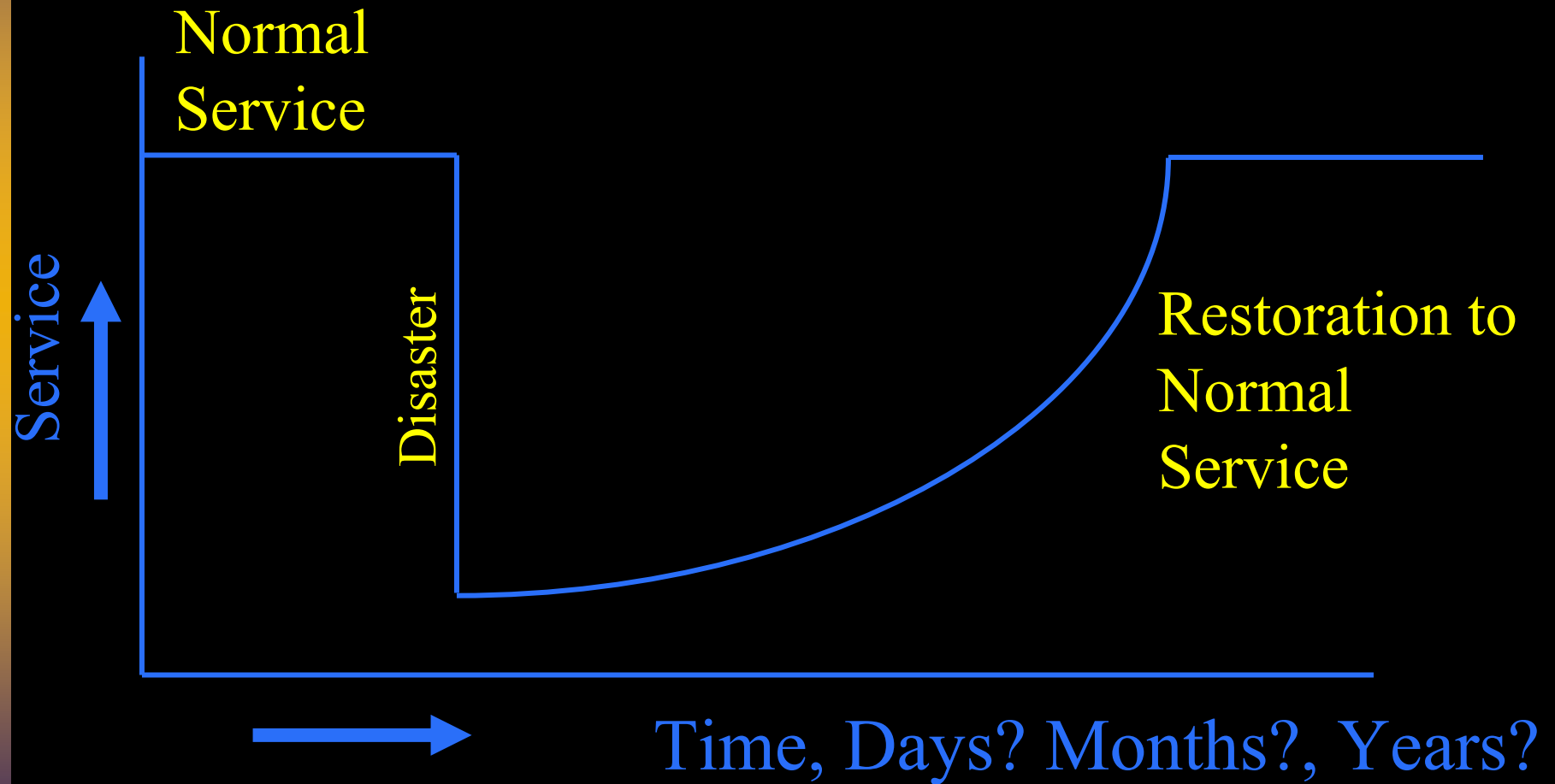
700,000

>50%

most



Health Services Scenario post Earthquake





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Nepal's Efforts on DRR in Health Sector

- ◆ 1988 Udaypur Earthquake, M6.6: Several hospitals & Health Facilities collapsed
- ◆ 1993 Floods in South-central Nepal: Disaster Health Working Group (DHWG) Founded (Health, Logistics and Food & Agriculture)
- ◆ 1997-2000: Earthquake Scenario & Action Planning – Problem of Hospitals revealed (**Hospitals' VULNERABILITIES NEED TO BE ADDRESSED!**)
- ◆ 1998: Seismic Vulnerability Assessment of one Building of Bir Hospital (US Corps of Engineers)
- ◆ 1998 and 2000: Workshops on Health and Disaster
- ◆ 2000: Seismic Assessment of Bir Hospital (Planning Aspects)



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Nepal's Efforts on DRR in Health Sector (2)

- ◆ 2000: Disaster health Working Group (DHWG) Revitalized (Organized Approach Started)
 - 2001: Emergency Preparedness and Disaster Response Plan of the Health Sector in Nepal
- ◆ 2001: Structural Assessment Major Hospitals in KV
- ◆ 2001 onwards: MUSTER, Mock Drill, Workshops/Orientation to Kathmandu Private Hospitals
- ◆ 2003: Non-structural Assessment of Hospitals in KV, structural and Non-structural Assessment outside KV
- ◆ 2004: Guidelines for Seismic Vulnerability Assessment (Structural, Non-Structural, Functional)



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Nepal's Efforts on DRR in Health Sector (3)

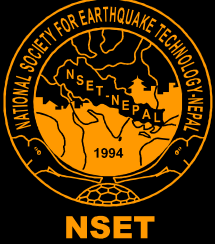
- ◆ 2003: Construction of an Earthquake-resistant Emergency wing of Bhaktapur Hospital (MOH, USA/DOD)
- ◆ 2003-2008: PEER Program (HOPE, MFR) (USAID/OFDA + NSET)
 - Curriculum being revisited to make MULTI-HAZARD -centric
- ◆ 2006-2007: Vulnerability Assessment of Blood Banks

+

Learning from Recent Earthquakes Gujarat, Bam and Kashmir



Helped to Identify the Problem – What Worked, What not, What can be done!



A. Policy and Process of Health-sector DRR

Need to Work even in Condition of No Policy

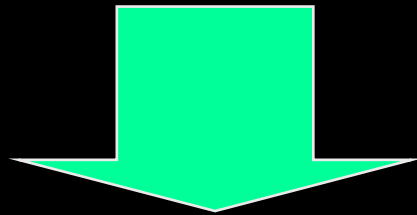
Policy



Program



Implementation



Alternate Approach

Activity



Plan



Policy

NSDRM – Includes Health Sector Strategy

HOPE Institutionalize: NRs. 1.8 M by MOH to TUTH

DHWG: Institutionalized



**Positive
Changes**

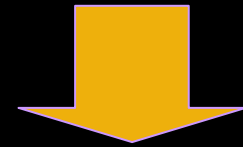
B. Vulnerability assessment

Structural Vulnerability

Nonstructural Vulnerability

Functional Vulnerability

Mitigation Measures



**Approach,
Methodology and Key
Findings**



Non-Structural Assessment

Identification of Critical systems and Facilities

Hospital Components Contributing to Functionality of Hospital After an Earthquake

Structural Components

Non-Structural Components

Emergency preparedness Plan

Medical facilities

Lifeline facilities

Architectural Elements

Emergency exit system

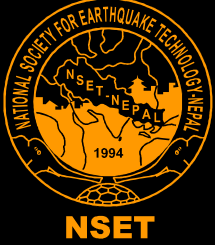
Medical Gas system

Water Supply system

Electricity system

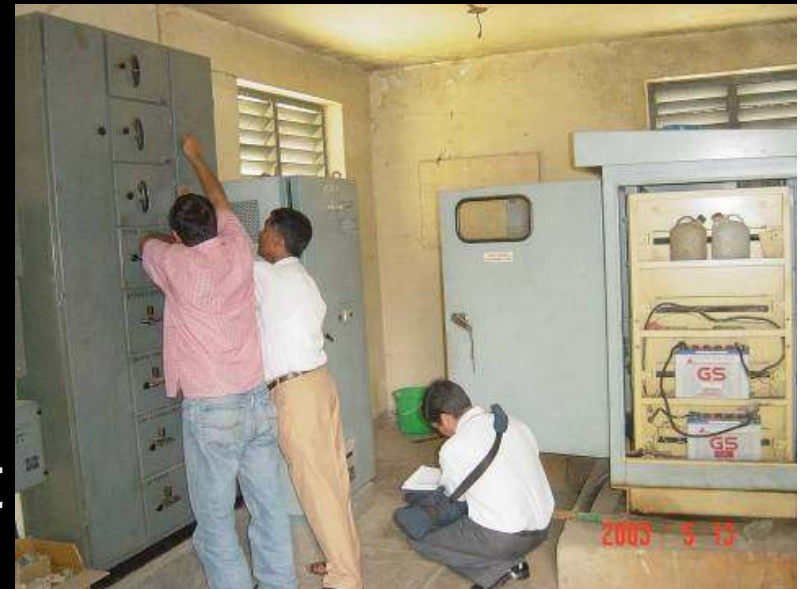
Communication system

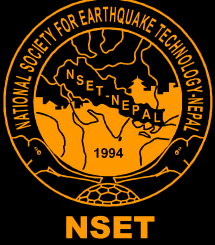
Fire system



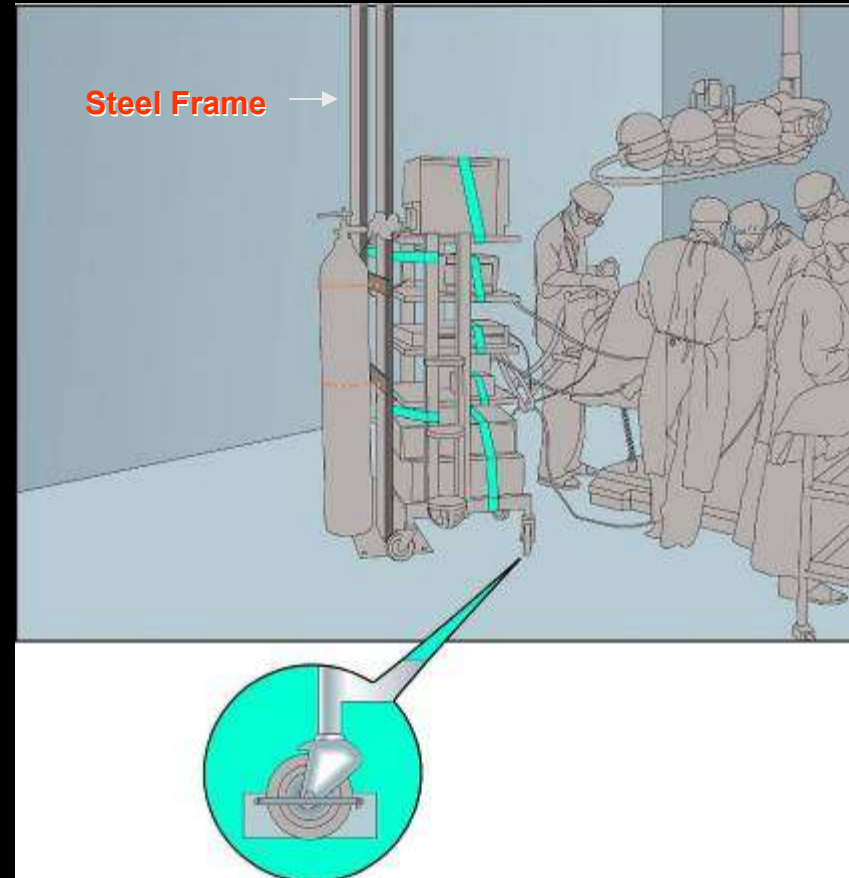
Seismic Vulnerability Assessment

- ◆ Structural Vulnerability Assessment of 19 Major Hospitals
- ◆ Non-Structural Vulnerability Assessment of 9 Major hospitals
- ◆ Methodology consolidated as “Guidelines for Seismic Vulnerability of Hospitals”





Identification of Vulnerability Reduction Options



Improving Safety of Operation Theaters



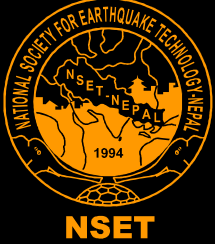
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Phase-I

Assessment Recommendations

Recommendations	Preliminary Cost Estimate for Implementing Recommendations	Remarks
<ul style="list-style-type: none">♦ Fixing of All Equipment and Contents♦ Strengthening of Some Critical Systems♦ Training to Hospital Personnel♦ Provision of Some Redundancy in Critical Systems	<u>NRs. 10,7 million</u> <u>(≈US\$ 150k)</u>	Cost for Implementing Phase-I in 9 Hospitals

2004 cost, now almost doubled

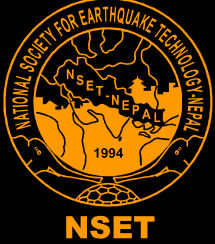


Assessment Recommendations

Phase-II

Recommendations	Preliminary Cost Estimate for Implementing Recommendations	Remarks
<ul style="list-style-type: none">♦ Retrofitting of Some Hospital Buildings♦ Further Strengthening of Critical Systems♦ Provision Redundancy in some more critical systems	US\$ 5,2 million	Major 9 Hospitals

2004 cost, now almost doubled



Unacceptable Level of Performance of Hospitals

Expected Performance

Design Earthquakes

Frequent
(50%-50 Years)

MMI VII

Occasional
(20%-50 Years)

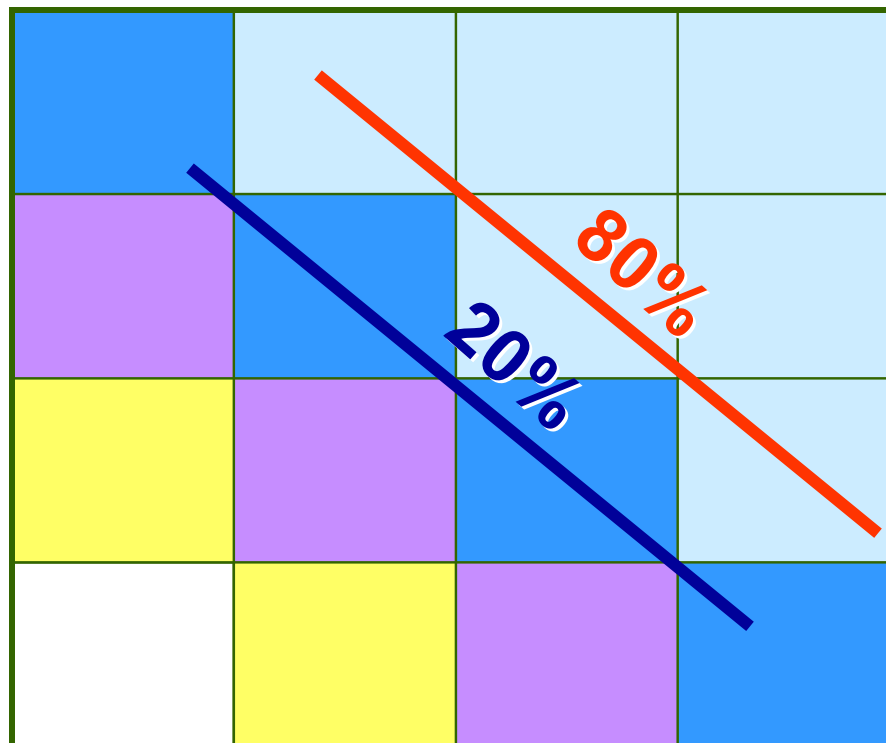
MMI VIII

Rare
(10%-50 Years)

MMI IX

Very Rare
(5%-50 Years)

Fully Operational Functional Life Safety Near Collapse

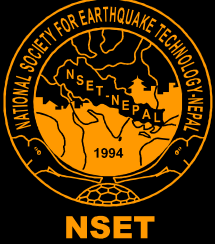


Unacceptable Performance for New Construction

Performance Objective for Standard Occupancy Buildings

Performance Objective for Emergency Response Facilities

Performance Objective for Safety Critical Facilities



Expected Performance After Implementing Phase I Recommendations

Expected Performance

Design Earthquakes

Frequent
(50%-50 Years)

MMI VII

Occasional
(20%-50 Years)

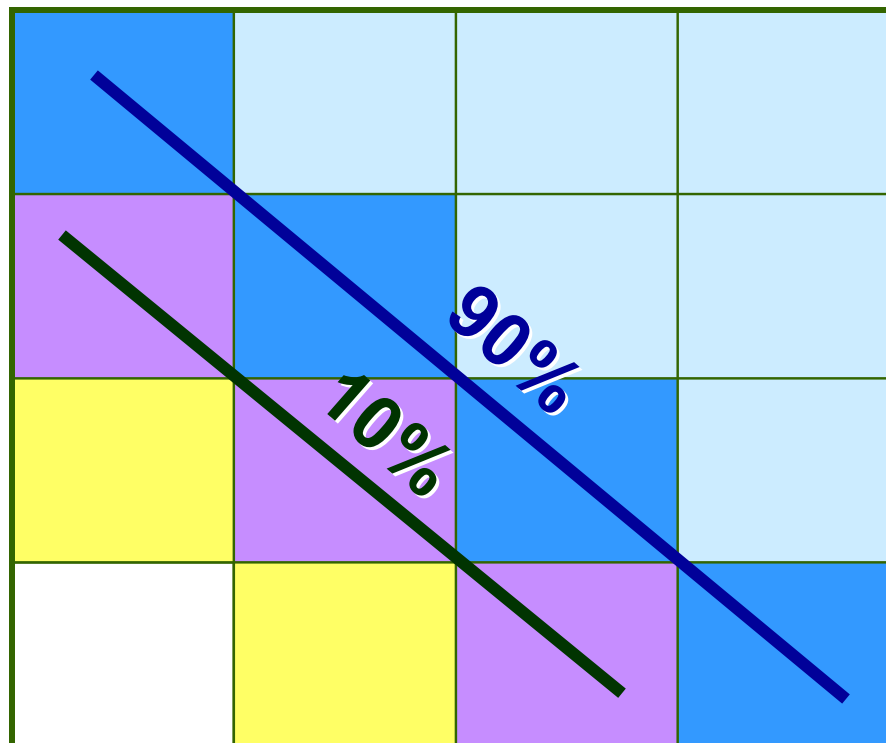
MMI VIII

Rare
(10%-50 Years)

MMI IX

Very Rare
(5%-50 Years)

Fully Operational Functional Life Safety Near Collapse



Cost

US\$ 150,000.00

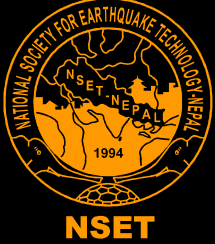
Unacceptable Performance for New Construction

Performance Objective for Standard Occupancy Buildings

Performance Objective for Emergency Response Facilities

Performance Objective for Safety Critical Facilities

2004 cost



Expected Performance After Implementing Phase II Recommendations

Expected Performance

Design Earthquakes

Frequent
(50%-50 Years)

MMI VII

Occasional
(20%-50 Years)

MMI VIII

Rare
(10%-50 Years)

MMI IX

Very Rare
(5%-50 Years)

Fully Operational Functional Life Safety Near Collapse

Cost
US\$ 5,200,000.00

Unacceptable Performance for New Construction

Performance Objective for Standard Occupancy Buildings

Performance Objective for Emergency Response Facilities

Performance Objective for Safety Critical Facilities

2004 cost



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C. Training and Capacity Building

- ♦ Interactive computer-based mass casualty management training and simulation exercises (Multi-User System for Training Emergency Response: **MUSTER**)
- ♦ Field and hospital-based mass casualty management training and **mock drill exercises**
- ♦ **Medical First Response (MFR)** – a foundation course under the six-country 5-year Program for Enhancement of Emergency Response (PEER)
- ♦ **Hospital Preparedness for Emergencies (HOPE)**: a uniquely popular training program



HOPE and MFR as a Part of PEER



CSSR



MFR

PEER (1993-2008)

(NSET/ GON/

USAID/ OFDA)



HOPE





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Motivation: Why we did what we did?

- ⊗ Moral imperative after the 1988 earthquake and 1993 Floods: many hospitals and health centers collapsed
- ⊗ Successful awareness raising: using earthquakes in Nepal, Bam, Gujarat, Turkey, Kashmir
- ⊗ The Earthquake damage scenario – Action Planning – earthquake awareness– under the KVERMP created felt-need and high demand
- ⊗ Hospital Assessment is an eye-opener! Private Hospitals follow suit
- ⊗ Health-sector problem tied up with the overall problem of DRR – comprehensive outlook of the stakeholders
- ⊗ Existing gap in the region
- ⊗ **Presence of NSET as a devoted ERM-focused advocate institution provided the necessary push**
- ⊗ **National – Regional – International partnership pays**



Some Lessons being learned!



Mitigation can be done at different phases/
different levels – incremental safety can be
designed and implemented!

- ⊗ If no have millions, can start with thousands!

- ⊗ Low cost solutions for seismic vulnerability
reduction can be identified and implemented

- ⊗ State-of-the-art technology of vulnerability assessment
may not directly be applicable

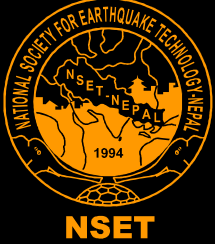
- ⊗ Comprehensive approach PAYS: Awareness
Component helped for change

- ⊗ Earthquake as the Worst case Scenario - helps

- ⊗ Knowledge Exists or can be accessed: Experience
is Important

- ⊗ Methodology development by Localization, Adaptation,
based on Experience

- ⊗ Build on experiences from Other Sectors, Developed for
Health Sectors e.g. shelter, critical facilities)



What Next? (1)

- ♦ High Need for **Capacity Development** Vis-à-vis the Very Very high level of Risk

Individual

Awareness, First Aid, EQ Go bag

Community

Volunteers, Contingency, MFR, First Aid

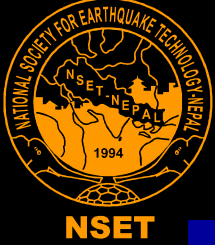
Hospital/
Institution

Assessment/Retrofitting, Planning Guidelines, ER Plan, HOPE and Other Training

Central

Strategy, Policy, Legislation, Coordination, Decrees, Guidelines

Capacity Development at all Levels



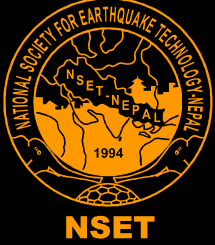
What Next 2. Regional Level Intervention

Roaster of Regional Experts/Trainers/Instructors/Auditors

- ◆ Advocacy, Commitments, Audits (naming & shaming!)
- ◆ Partnership Development + Networking
- ◆ Capacity Building
- ◆ Standardization/Certification
 - Training Curricula
 - Methodology
- ◆ Experts Review: earthquake centric to multi-hazard centric

Build Upon Existing
Initiatives

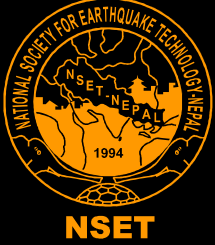
PEER, HOPE,
MUSTER



What Next 3 . National Level Intervention

Action, and Action!

- ◆ Policy, Strategy, Institutional Arrangements, Plans
 - ◆ National Program for DRR for Health-sector
 - Reaching to the health centers at districts
 - ◆ Networking of Health Services
 - ◆ Co-ordination with Other Sectors
-
- ◆ Stop Increasing Risk: All hospitals should be disaster-resistant
 - Encourage New Technology- Base Isolation
 - ◆ Decrease Unacceptable Risk: Retrofitting and furniture fixing (NSM)

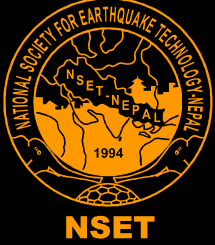


What Next 4. Hospital, Health Post, Community

End Points of Health Sector Services Delivery

- ◆ Ensure Functionality
 - Continuity of Services
 - ERP Plan
 - MFR, Drills etc.
- ◆ Help prepare Individuals/Community

Implement New Technology: e.g. Base Isolation



What Next 5. Others

- ◆ Continue EHA Profiling and Updating
 - Info in Web
- ◆ Awareness, Education, Drills
- ◆ Draw-in Private sector health facilities into the process of DRR
- ◆ Annual WS/Conference, Networking
 - Regional
 - National



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Thank You!