

**Discussion Program:
Insights from Gorkha and Jajarkot Earthquakes and Cost-Effective
Housing Solutions
April 18, 2024**

**Lessons of Nepal's Recovery and Reconstruction
after Recent Earthquakes**

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NSET

Disaster Resilient Communities in Nepal

Outline

- 1. Lessons from Gorkha Earthquake Recovery**
 - 2. Jajarkot Earthquake and Needs**
 - 3. Opportunities and Way Forward**
-

Gorkha Earthquake 2015

Event Description: Nepal Earthquake, April 2015 (7.8 M_w)

Time of Occurrence: 11:56 am (Local Time)

Epicenter: Barpak, Gorkha

Location: 28.230°N, 84.731°E

Casualty

Death: 8,790

Injury: 22,300

Damage

Private Housing: 498,852 destroyed
256,697 damaged (*Initial Assessment*)

Educational Buildings: 7,553

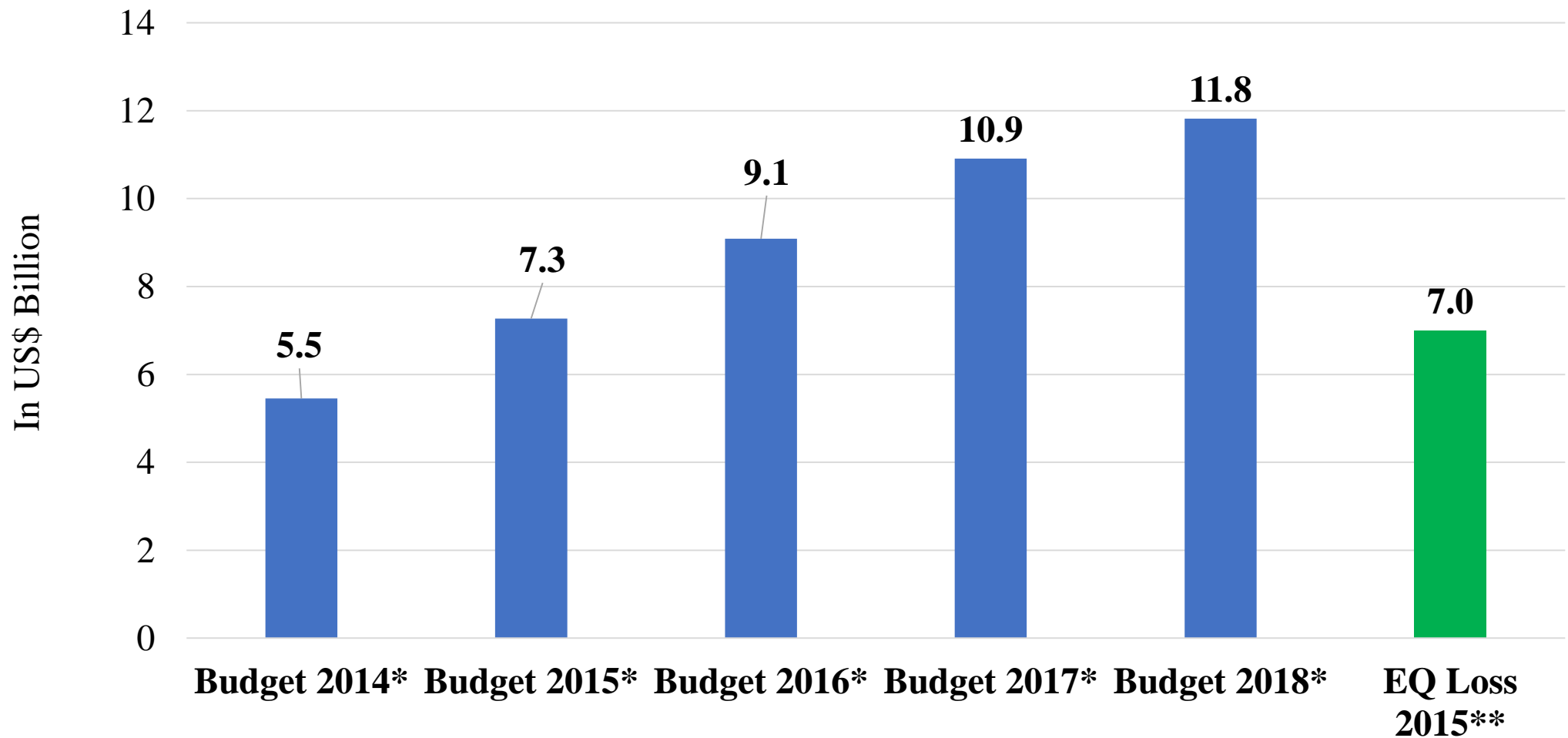
Heritages: 753

Health Post/Hospitals: 1,197

Security Buildings: 383

Drinking Water Networks: 3,212

Comparison of Earthquake Loss to National Budgets Five years Budget of Nepal)



Source: *Ministry of Finance, **PDNA report



Reconstruction Needs: Sector Budgets (After PDRF)

NPR 838 billion

645

Social

Housing - 376
Education - 180
Heritage - 34
Health - 17

106

Productive

Agriculture - 26
Environment - 28

61

Infrastructure

Transport - 24
WASH - 21

26

Cross-Cutting Issues

Social Protection - 8
Gender - 5

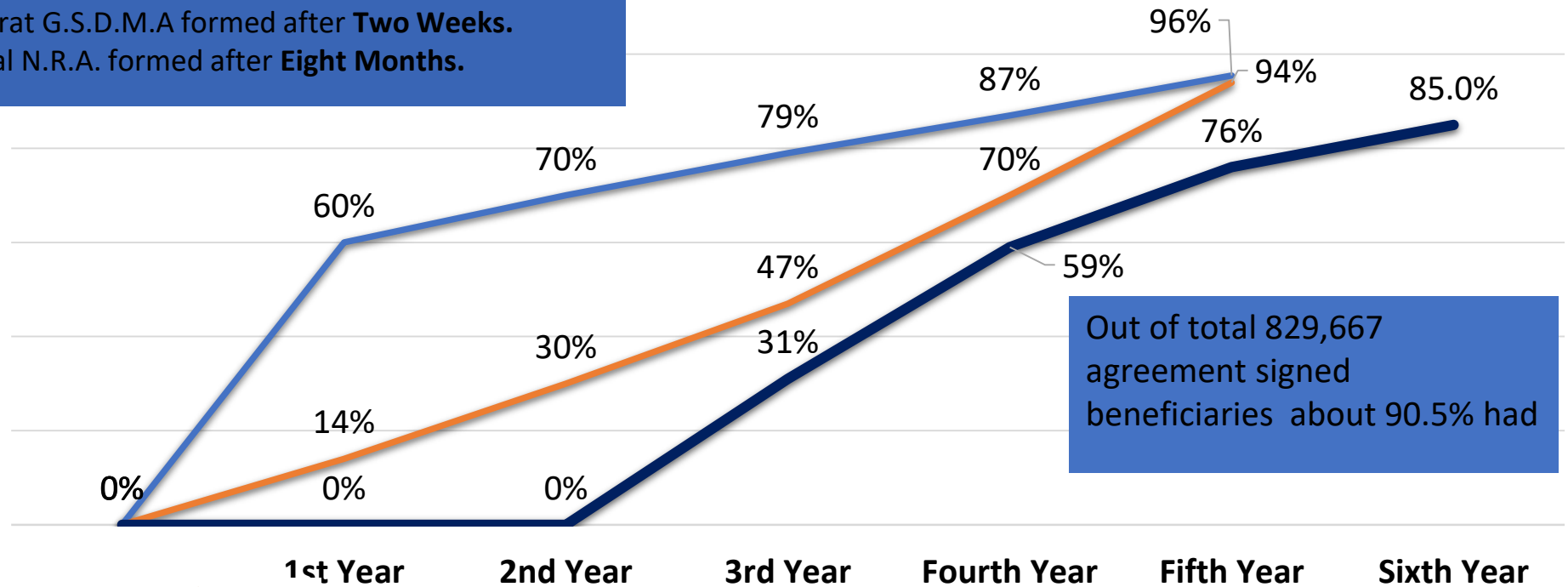


Initial Challenges in Nepal's Reconstruction

- Political transition and absence of local elected representatives
- Lack of system, infrastructure and trained human resources – limited prior experience
- Difficult geographical terrain, limited road accessibility - hindered transportation of materials
- Emerging Information Technology and banking systems, lack of IT and banking infrastructures in remote areas
- However, lessons of similar earthquake reconstruction in neighboring countries were very helpful

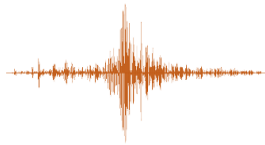
Progress Comparison of Housing Reconstruction in Pakistan, India and Nepal

- In Pakistan E.E.R.A. formed after **Two Weeks**.
- In Gujarat G.S.D.M.A formed after **Two Weeks**.
- In Nepal N.R.A. formed after **Eight Months**.



Out of total 829,667 agreement signed beneficiaries about 90.5% had

Earthquake Event



PROGRESS IN YEARS

— Progress in Gujarat — Progress in Pakistan — Progress in Nepal

Source: Datasets of EERA, GSDMA, NRA & HRRP

1. Institutional continuity is crucial:

- Initial delay in policy formulation and institutional set-up created confusion and several other problems
 - Institutional continuity crucial for longer-term recovery and reconstruction such as for urban recovery.
 - NRA – to – NDRRMA and several other line ministries and departments – progress not as was during the NRA period
 - Handover not only includes responsibilities, budgets but also a capacities, institutional memories, required human resources.
 - Sub-national level DRRMAs / DMC are crucial
-



2. Policy clarity is must

- PDNA and PDRF laid strong foundation for recovery planning
- 85% of physical damage from earthquakes occurred in rural settings, Rural reconstruction and recovery dominate Nepal's reconstruction efforts.
- Housing financing laid foundation for economic recovery but was insufficient.

3. Defined roles of institutions - road map for effective recovery

- Each institution needs a road map for recovery and reconstruction within its jurisdiction.
 - Resource constraints require establishing priorities.
 - Integration into the government's regular development planning cycle enhances success
-



4. Establishment of long-term risk reduction vision

- All infrastructures and houses built to current relevant building code standards.
 - Follow concepts of “build back better”
 - Robust enforcement mechanism with trained human resources for safer construction and compliance check
 - Importance of establishment of Management Information Systems (MIS) at the local level for multi-hazard risk reduction and management.
 - **Integration of disaster risk into development planning – Risk-informed development planning**
 - **Technical standards for public building and infrastructure for wider scope**
 - **Technical details and inventory of heritage structures prior to disasters**
-

5. Engagement with affected communities

- Engagement with affected people and communities crucial for reconstruction success.
- Active community engagement in project planning and decision-making enhances ownership and dignity.
- Direct engagement fosters sustainability, openness to learning, and resilience-building.

6. Engaging local government to enhance capacity in disaster risk reduction.

7. Strong repository, continuous monitoring and research on recovery



8. Urban Recovery (Lessons of Gujarat, Kashmir and Nepal)

- **Urban Recovery is a slow process – Need a long-term planning, increased technical capacity at local levels**
- **To be integrated with the development planning**
 - Huge expansion after the earthquake – increased population
 - Land development, land changes are very drastic



NSET Way Forward after 2021

- Continue the best approaches of recovery
 - Damage based support systems
 - Build Back Better
 - Owner driven vs. other mechanisms
 - Grant disbursement mechanisms and banking system
- **Enhance the role and capacity of local governments**
 - Consider frequency and extent of disasters in Nepal
 - Decentralized actions is perhaps the only way to manage recovery after disasters



NSET Way Forward after 2021

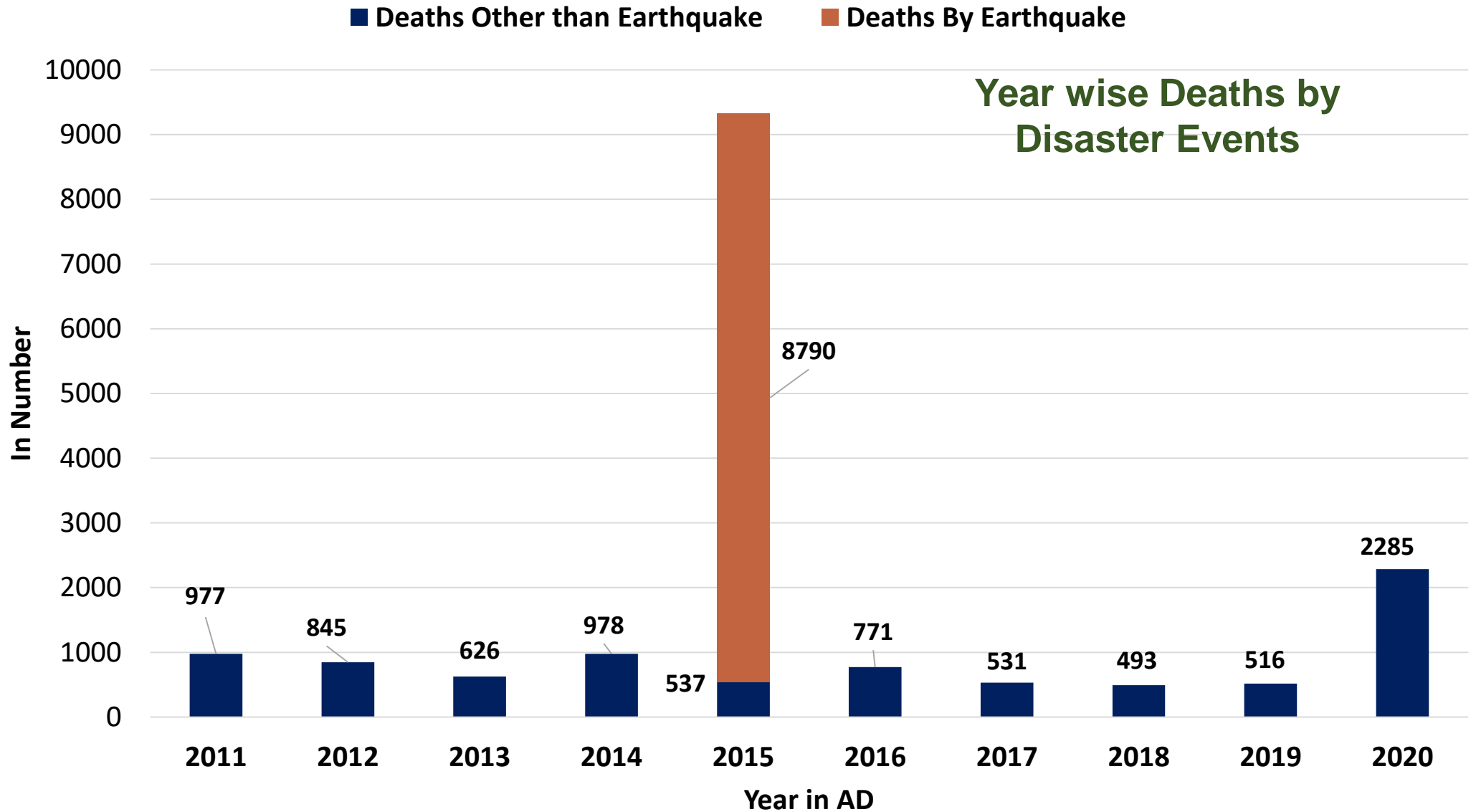
- Need to sustain the mechanism of safer building practices
 - Building permits linked with building code compliance
 - Training and technical assistance at local levels
 - Inspection and compliance system
- Large number of NGOs/Civil Society Organizations mobilized for socio-technical assistance
- Continue system of socio-technical assistance for promoting safer construction

476 Total Partner Organizations Involved in Gorkha EQW Reconstruction

Lessons learned! Lessons not learned!!

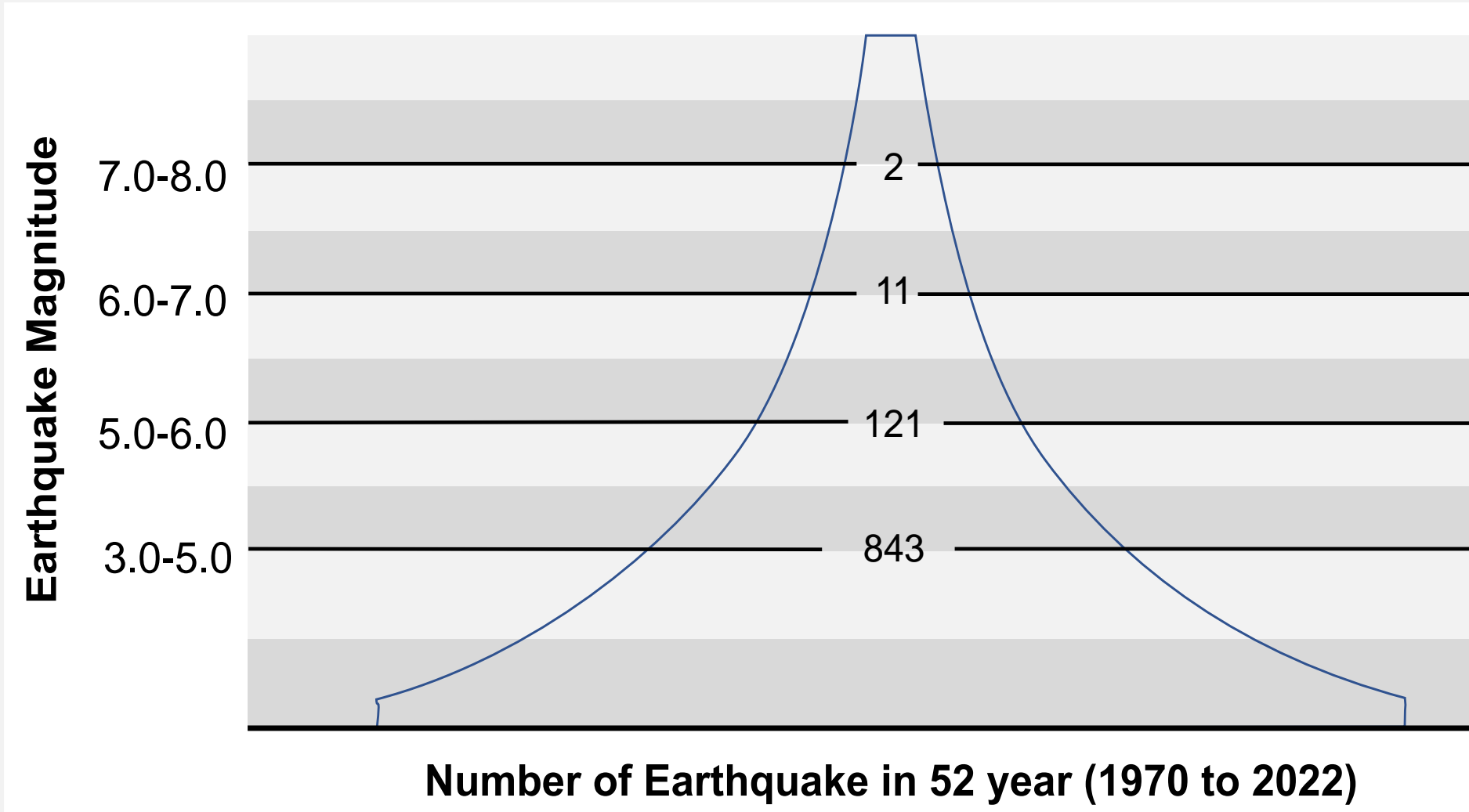


We will have to continue face disasters..





नेपालमा गत ५२ वर्षका भूकम्पहरु



५२ वर्षमा भूकम्पको संख्या



NSET The West Nepal Earthquakes

Disaster Resilient Communities in Nepal

Earthquakes in Karnali and Sudurpashchim Province

- 3 November 2023, **6.4ML**
Epicenter: Ramidanda,
Jajarkot

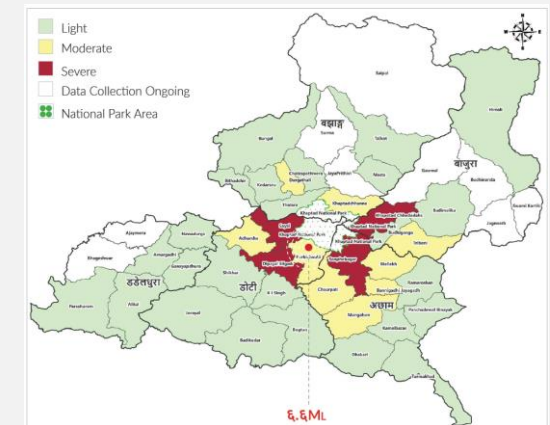
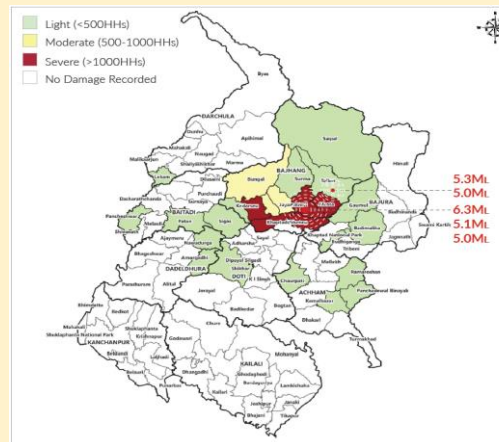
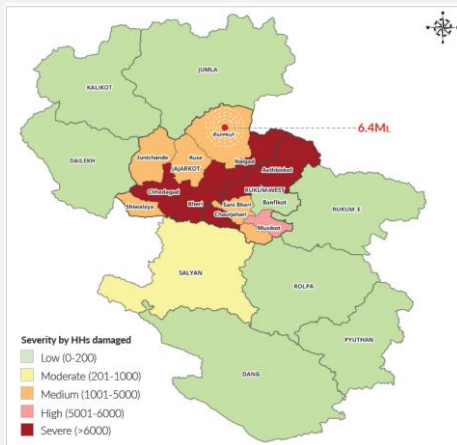
- 3 October 2023, **5.3 & 6.4ML**
Epicenter: Jaya Prithivi,
Bajhang

- 8 November 2022, **6.6ML**
Epicenter: Purbichauki,
Doti

- **Human Loss: 154 Deaths**
366 Injured

- **Human Loss: 1 Death**
30 Injured

- **Human Loss: 6 Deaths**
8 Injured





क्षतिग्रस्त भवनहरु



Complete Damage



Extensive Damage



Slight-Moderate Damage



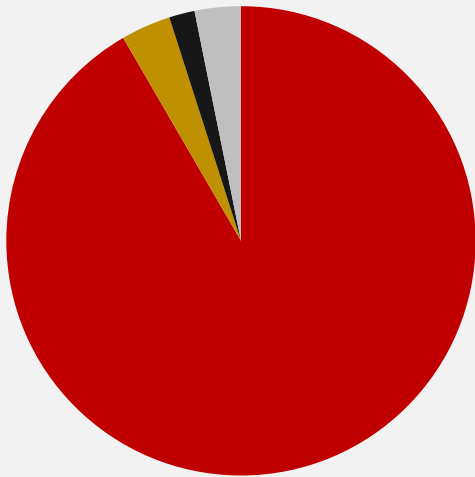
Very Slight or No Damage



Preliminary Damage and Needs

| Social Sectors | Infrastructure Sectors | Productive Sectors | Cross-cutting Issues |
|---------------------------------|-------------------------------|---------------------------|---------------------------|
| Housing and Settlements | Electricity and Energy | Agriculture and Livestock | GEDSI |
| Government and Public Buildings | Communication | Irrigation | Employment and Livelihood |
| Health | Transport – Roads and Bridges | | |
| Education | | | |
| Cultural and Heritage Buildings | | | |

Share of Disaster Effects across Sectors



| | | |
|---|------|----------------------------|
| <ul style="list-style-type: none"> ● Social Sectors 91.63% (of which 57.58% in housing sector) | Need | USD. 432,313,029 |
| <ul style="list-style-type: none"> ● Infrastructure Sectors 3.43% | | USD. 16,175,072 |
| <ul style="list-style-type: none"> ● Productive Sectors 1.76% | | USD. 8,312,933 |
| <ul style="list-style-type: none"> ● Cross-cutting Issues 3.18% | | USD. 15,000,000 |

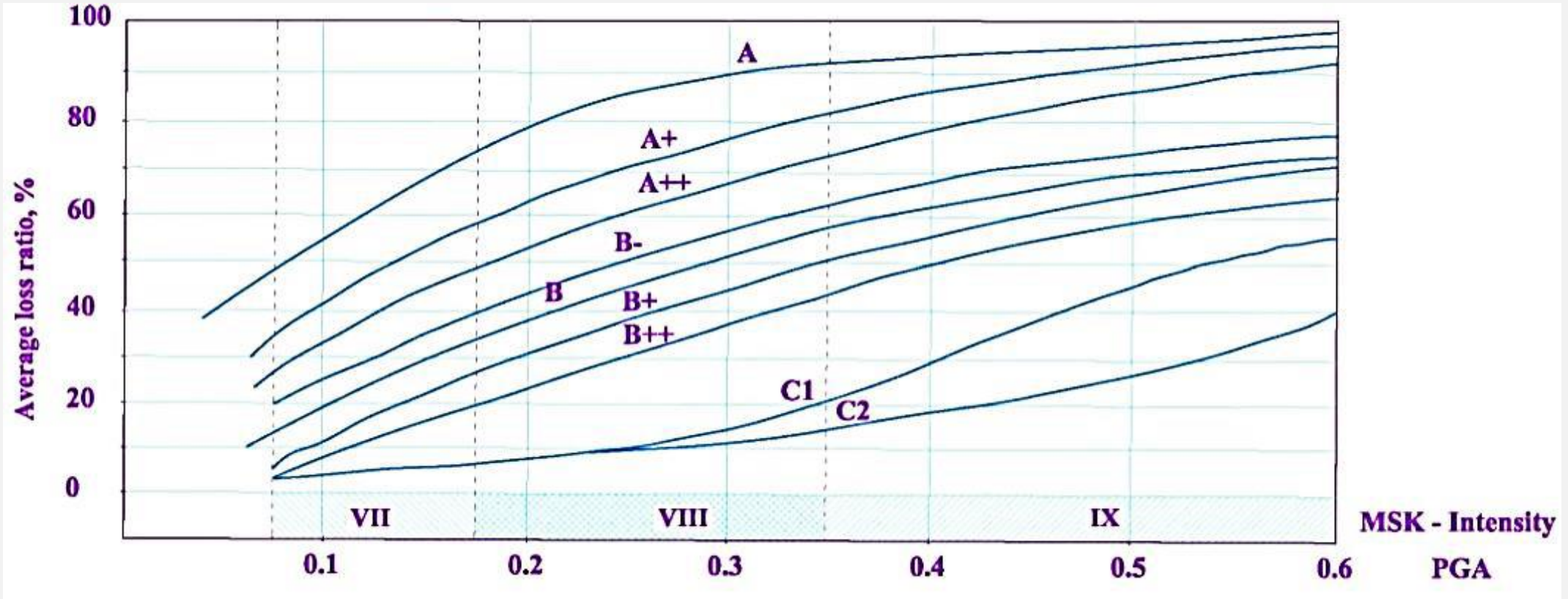
Need
USD. 471,801,034
(471 Million)

USD. 1 = NPR.
132

• Housing sub-sector consists of damage data from 2013 earthquakes. Other sub-sectors comprises of data only from Jajarkot and Bajhang Earthquake mentioned in Slide # 4



विभिन्न प्रकारका भवनमा हुने क्षतिको प्रकृति (Fragility)



Type A: Low strength masonry like field stone, adobe etc. (Mud based)

Type B: Cement mortar ordinary brick buildings

Type C: Reinforced concrete and steel buildings

Fragility curves for different types of masonry and concrete buildings (Redrawn after NBC, 1994)



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पुनर्निर्माणको लागत

| विकल्प | | भवन संख्या | अनुदान | घर धनी | प्रति भवन लागत | कुल लागत | कुल लागत | घरधनीको लागत | अनुदानको लागत |
|--------|--------------|------------|----------|-----------|----------------|----------|----------|--------------|---------------|
| १ | पुनर्निर्माण | ४०,००० | ५,००,००० | १०,००,००० | १५,००,००० | ६० अरब | ८० अरब | ४८ अरब | ३२ अरब |
| | प्रवलीकरण | ४०,००० | ३,००,००० | २,००,००० | ५,००,००० | २० अरब | | | |
| २ | पुनर्निर्माण | ४०,००० | ५,००,००० | १०,००,००० | १५,००,००० | ६० अरब | ८० अरब | ४४ अरब | ३६ अरब |
| | प्रवलीकरण | ४०,००० | ४,००,००० | १,००,००० | ५,००,००० | २० अरब | | | |
| ३ | पुनर्निर्माण | ७०,००० | ५,००,००० | १०,००,००० | १५,००,००० | १०५ अरब | ११० अरब | ७२ अरब | ३८ अरब |
| | प्रवलीकरण | १०,००० | ३,००,००० | २,००,००० | ५,००,००० | ५ अरब | | | |
| | | | | | | | | | |
| ४ | पुनर्निर्माण | ८०,००० | ५,००,००० | १०,००,००० | १५,००,००० | १२० अरब | १२० अरब | ८० अरब | ४० अरब |

प्रति घर सामाजिक-प्राविधिक सहयोग NPR 4,000
सामाजिक-प्राविधिक सहयोग Total NPR 32 करोड



तालिमको संख्या

| तालिमको संख्या | प्रति तालिम सहभागीहरू | प्रति वर्ष सहभागीले निर्माण गरिने भवनहरूको संख्या | वर्ष | निर्माण भवनको संख्या |
|--|-----------------------|---|------|----------------------|
| डकर्मी तालिम (Skill Upgrade) | | | | |
| १० | ३० | ९ | ३ | ७२,९०० |
| डकर्मी कार्यगत तालिम (Develop New Masons) | | | | |
| ४० | १० | ९ | ३ | १०,८०० |



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Opportunities and Way Forward

- Opportunity for promoting Retrofitting
 - Local construction materials and technologies
 - Partnerships with local organizations, local governments and provincial government
 - Need of comprehensive scientific study on damage and impacts
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Way Forward

Shall we have different approaches for different disasters with different extent of damage?

Large disasters vs. smaller frequent disasters

Thank You!
