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LAND ISSUES AND GEO-INFORMATION: RESPONDING POST DISASTER EARTHQUAKES IN NEPAL

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INTERNATIONAL WORKSHOP ON THE ROLE OF LAND PROFESSIONALS AND SPATIAL DATA INFRASTRUCTURE IN DISASTER RISK REDUCTION: IN THE CONTEXT OF 'POST NEPAL EARTHQUAKE 2015', 25-27 NOVEMBER 2015, KATHMANDU, NEPAL

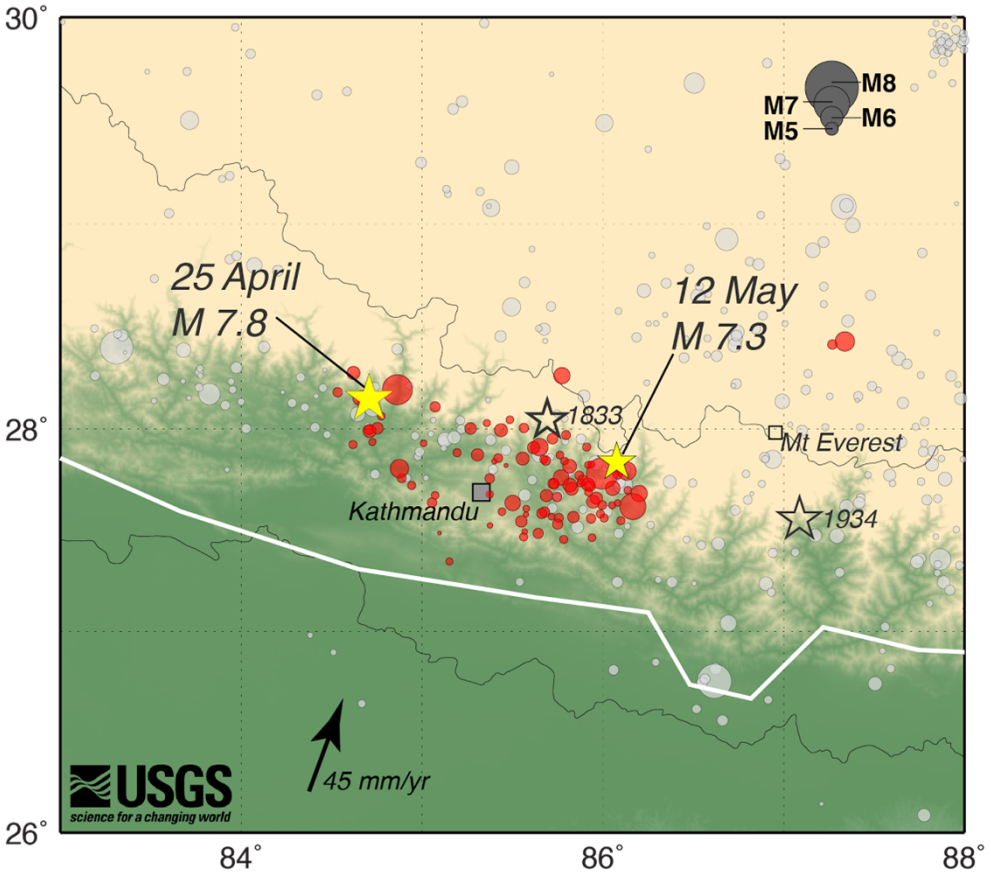
ITC FACULTY OF GEO-INFORMATION SCIENCE AND EARTH OBSERVATION

PRESENTATION CONTENT

- Introduction
- DRR International frameworks and gaps
- Disaster impacts on land and land issues
- Land responses – principles
- Post disaster responses
- Adjudication of land rights
- Reconstruction and development ongoing activities
- Geo-information – International efforts and applications
- Conclusions

INTRODUCTION
EARTHQUAKE IN NEPAL

- The most dangerous natural disaster - major earthquake of 7.8 Richter scale took place about 76 km northwest of Kathmandu on 25 April 2015
- After that more than 300 aftershocks followed
- Around 9000 people died and more than 25,000 people injured.
- About eight millions population of Nepal are affected



INTRODUCTION
EARTHQUAKE IN NEPAL

- Many destructions
  - Residential buildings
  - Temples, heritage sites,
  - Schools, health centers,
  - Infrastructures - Roads, bridges, water supply,
  - Agriculture lands, other lands,
  - Hydropower,
  - Landslides,
  - Etc.





INTRODUCTION
VULNERABILITY AND RESILIENCE

- A disaster is the consequence of a natural hazard – volcanic eruption, earthquake, landslide, tsunami, etc.
- Impacts on human ***vulnerabilities*** lead to human, structural and financial losses.
- Loss depends on the capacity of affected population to support or resist the hazard – ***resilience***

INTERNATIONAL FRAMEWORKS

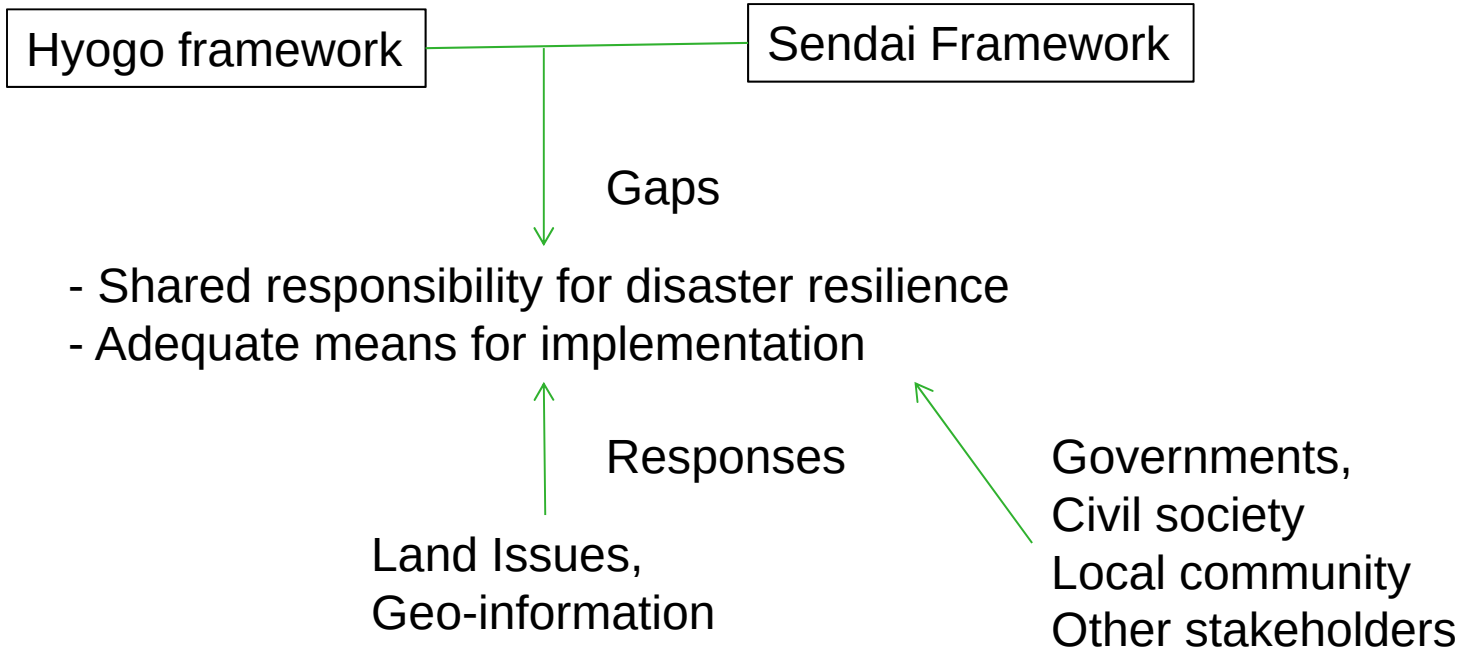
Hyogo framework for actions (HFA 2005)

- Ensure that DRR is a national and local priority with a strong institutional basis for implementation
- Identify, assess and monitor disaster risks and enhance early warming
- Use knowledge, innovation and education – culture of safe and resilience
- Reduce the underlying risk factors
- Strengthen disaster preparedness for effective responses at all levels

Sendai framework (SFDRR 2015)

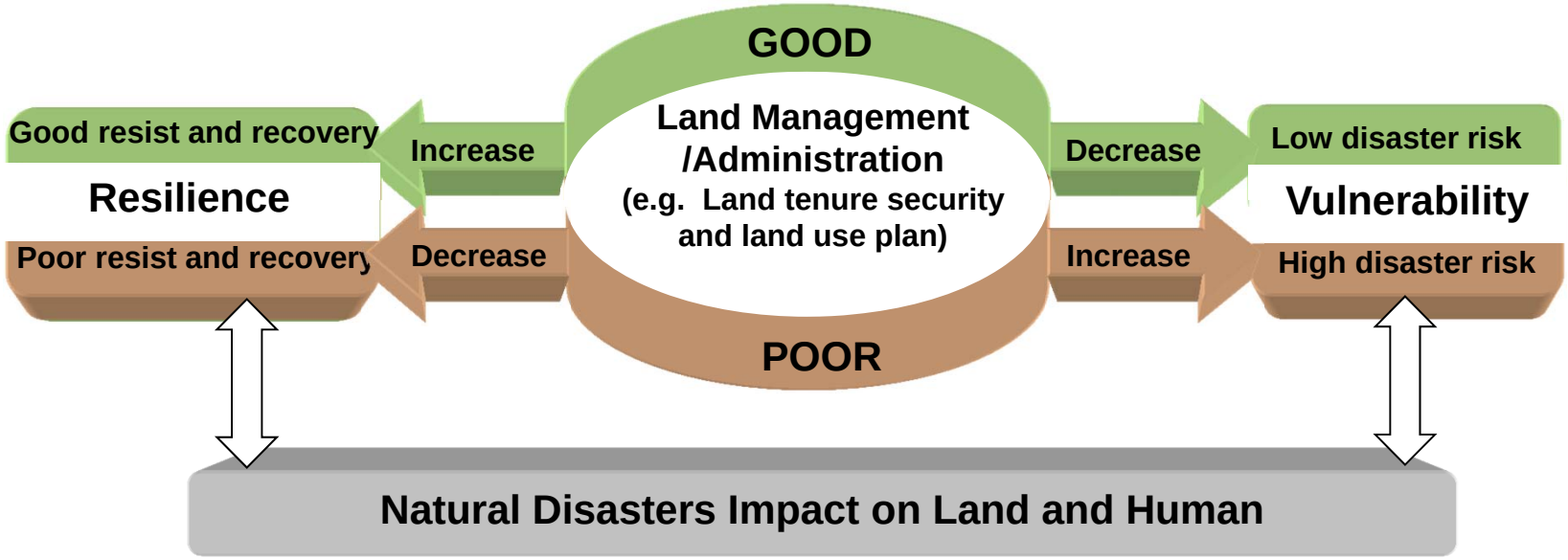
- Understanding disaster risks
- Strengthening disaster risk governance to manage risk
- Investing disaster risk reduction for resilience
- Enhancing disaster preparedness for effective responses, and to “Build Back Better” recovery, rehabilitation and reconstruction

IMPLEMENTATION GAPS AND RESPONSES



LAND MANAGEMENT/ ADMINISTRATION FRAMEWORK
RESILIENCE AND VULNERABILITY

Our recent research indicates land issues e.g. land tenure, land administration and land use planning establish good understanding on vulnerability and resilience of community/individuals in disaster risk areas



DISASTER IMPACTS ON LAND AND HUMAN RELATIONSHIPS WITH LAND

Disaster impacts	Areas affected	Associated land issues
Destruction	Land Housing Infrastructure Land records	New suitable land for shelter, livelihood and infrastructure; Tenure security for house reconstruction; Land and property disputes; Hazardous land; risk reduction
Displacement	Shelter Protection Livelihood	Site selection, planning and management; Secure access to land for vulnerable groups Secure access to land for livelihood, housing, land and property rights of displaced persons
Deaths	Shelter Protection	Secure access to land for durable shelter Secure access and rights to land for widows and orphans, degraded government response capacity

LAND ISSUES

- Land is fundamental to the recovery from disasters
  - Shelter
  - Protection
  - Livelihoods
  - Early recovery

LAND ISSUES
SHELTER

- People need access to land for all form of shelter
  - Emergency
  - Transitional
  - Permanent
- Information on land to provide assistance in the right place for the right people
- Planning for land use to build disaster resilient human settlements

LAND ISSUES
PROTECTION

- Rights to land – the human rights of all individuals affected by humanitarian operations and critical to the protection of vulnerable groups including women, children, landless.
  - Rights to non-discriminatory access to property
  - Rights to adequate housing
  - Rights against arbitrary deprivation of property

LAND ISSUES
LIVELIHOODS

- Access to land is essential for livelihood.
- In rural areas, insecure rights to land can
  - Undermine food security
  - Reduce investment in agricultural and resource based livelihood,
  - Leave landholders open to evictions
- In urban areas, security of land is critical
  - Reconstruction,
  - social and economy recovery
  - Restoring urban livelihood
- Land management is necessary to prevent unsustainable exploitation of marginal and unsafe land

LAND ISSUES
EARLY RECOVERY

- Addressing land issues from emergency relief to sustainable development
- Security of land tenure
  - For durable shelter and sustainable livelihood solutions
- Land use and settlement planning

LAND RESPONSES THAT PROMOTE DISASTER RESILIENCE
KEY PRINCIPLES

Principles	Effects on disaster resilience
Build on community initiatives	Builds on local risk reduction strategies Leverages local knowledge Builds local capacity Encourages sustainable resource management
Take a flexible tenure approach	Strengthens security of land tenure Improves access to shelter and livelihood
Focus on vulnerable groups	Minimizes landlessness; strengthens livelihoods
Take a pro-poor approach to land administration	Strengthens security of land tenure Strengthens local institutions Allows inclusive land management and planning
Adapt flexible and timely planning, land use and construction policies	Improved access in informal settlements Hazard resistant and sustainable building construction Improved disaster risk reduction

POST-DISASTER RESPONSE
LAND ASSESSMENTS

- Rapid assessment: amount of land affected; land needed for emergency relief purposes; a history of insecure tenure, unsustainable land use, landlessness, land conflicts, etc.
- Needs assessment: Tenure status, Land records, lost land, desire for return
- Loss and damage assessment: the nature and extent of damage to land, land documents and land administration
- Land availability and risk assessment: availability of sites for shelter and livelihoods, vulnerability to natural hazards of sites for shelter and livelihoods

POST-DISASTER RESPONSE
RECOVERY

- There is increased pressure for land during the recovery phase, as people resume livelihoods and displaced people return.
- People with insecure tenure face risk of eviction, or may be denied the right to return to land they previously occupied.
- When land is left unoccupied there is a risk that others may take over occupation of the land or buildings.

POST-DISASTER RESPONSE
LONG-TERM RECOVERY

- There are many cross-cutting land issues in the rapid and detailed assessments (i.e. assessments of livelihoods, displacement, shelter, agriculture, food security or vulnerability) and these inform decisions about resettlement and restitution.
- One of the most urgent and important land administration responses during the long-term recovery phase is the adjudication of the many claims to land.
- Disputes over land must be resolved prior to reconstruction, however there are often many parcels involved and this takes time.
- Involves a compromise between a rapid assessment, and a fair and transparent adjudication process.

ADJUDICATION OF LAND RIGHTS

- It is important to respect traditional cultural attitudes to land. There are two aspects
  - Determining the validity of land claims; and
  - Establishing the location of boundaries.
- Adjudication should be consistent with the UNHCR Pinheiro Principles on housing and property restitution, and comply with international human rights standards. http://www.ohchr.org/Documents/Publications/pinheiro_principles.pdf)
- The aim of restitution is to provide tenure security as least as good as the pre-disaster situation.

ADJUDICATION OF LAND RIGHTS

- Verification of legally legitimate rights may come from official land records.
- Cadastral maps and land titles are critical information if they exist and are up-to-date. These may be held by more than one agency.
- Pre- and post-disaster topographic maps, aerial photography, and satellite images can also be very useful.
- Valuation records are important in establishing adequate compensation for resettled people.

ADJUDICATION OF LAND RIGHTS

- Where public records are out of date or were lost or damaged, verification from local authorities and neighbors is important.
- Adjudication of socially legitimate claims to land are more difficult and many local and customary agencies can help verify claims.
- This process can be community-driven and facilitated by land agencies.
- Claims to land that are proved to be not legitimate cannot be supported.

ADJUDICATION OF LAND RIGHTS

Example from Aceh, Indonesia

- Community driven adjudication (CDA) was used successfully in Aceh after the 2004 Asian Tsunami
- The CDA process involved preparing a community land map, community-led parcel demarcation, and mapping and preparation of land ownership lists by the community.
- A public display was prepared by the facilitating agency or NGO.

RECONSTRUCTION AND ONGOING DEVELOPMENT ACTIVITIES

- Ideally, rebuilding capacity of the land administration system would commence early so that buildings are constructed in the correct position and there is restitution for the pre-disaster landholders.
- Restoring land administration capacity is important for economic recovery and provides a framework for acquiring land for resettlement, and for the construction of new buildings and public infrastructure.

RESTORING CAPACITY IN THE LAND ADMINISTRATION SYSTEM

- Damage to the land administration system can include
  - The impact on human resources caused by death of staff, or family members. New staff may be needed and re-training may be required.
  - Damage to land records. These should be recovered or reproduced where possible.
  - Damage to surveying infrastructure such as ground marks or GPS reference stations.
  - Damage to buildings such as land offices. These may need to be repaired or rebuilt

PROVIDING RESTITUTION FOR PEOPLE IN TRANSITIONAL SETTLEMENTS

- While transitional shelter is often needed, people expect this to be short-term.
- There are a range of transitional settlement options and in each case it is important to recognize the rights of the affected people to occupy their allocated settlement site.
- Where this settlement becomes long-term or permanent this should include formal recognition of their land tenure or land use rights.

PROVIDING RESTITUTION FOR PEOPLE IN TRANSITIONAL SETTLEMENTS

- Land acquisition may be required where private or customary lands are needed for resettlement, or infrastructure sites.
- Land acquisition should involve appropriate consultation with both the host community and the people being resettled.
- International guidelines state that adequate compensation based on accurate land valuation data is required.

GEO-INFORMATION
CONTRIBUTION OF SPATIAL DATA AND GIS

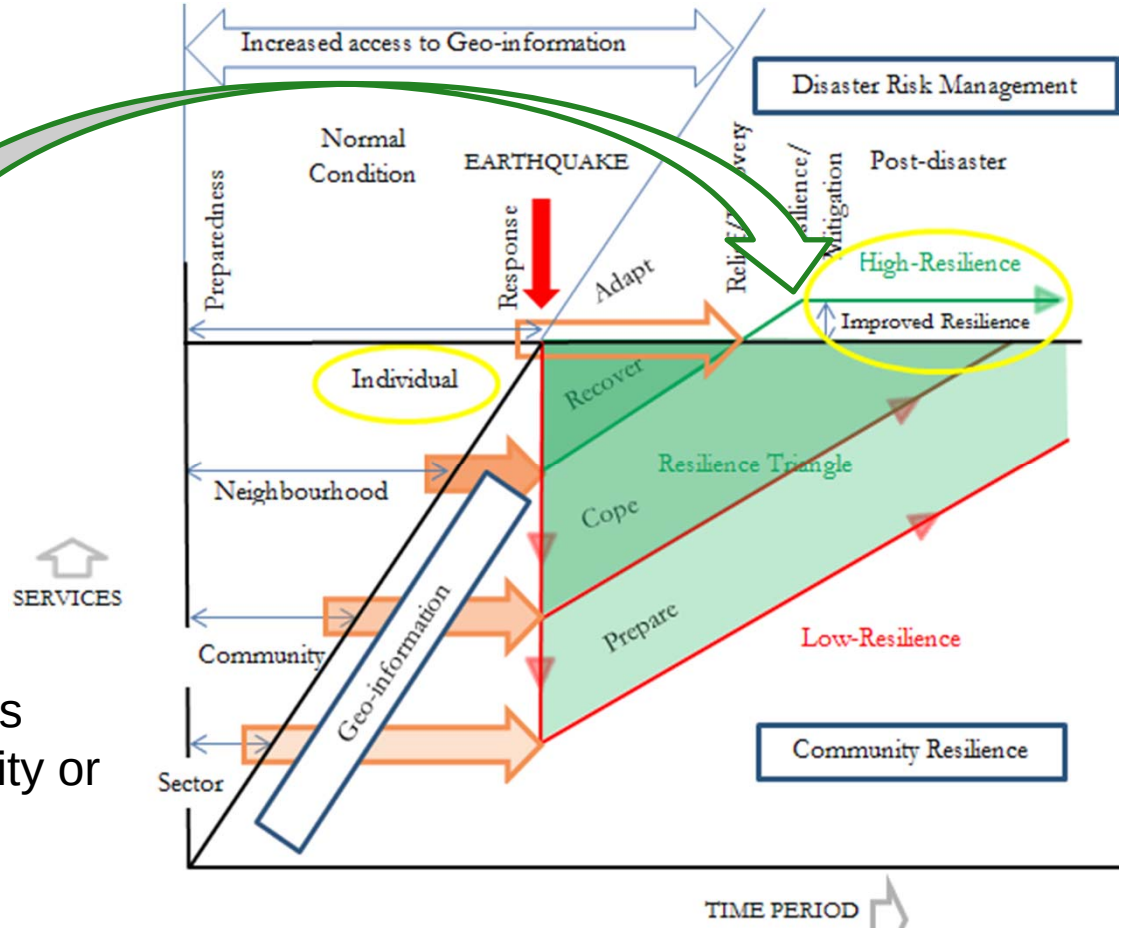
- Developing countries and poor communities are vulnerable. Many deaths and property losses could be prevented if better information were available on the exposed population and assets, the environmental factors in disaster risks, the pattern and behavior of particular hazards.
- Technologies such as meteorological and earth observation satellite, communication satellite, GPS and GIS have made geo-information easy available. Hazard modelling and community risk management system are also available for integration and implementing at community level.
- SDI concept is available to encourage sharing and improving access to spatial information in a consistent manner for the effective application to DRM and associated policy decision.

(Zevenbergen, Norman & Tuladhar, 2014)

CONCEPTUAL FRAMEWORK OF COMMUNITY RESILIENCE
CONTRIBUTION OF SPATIAL DATA

Resilience is a *positive transformability*

Increased geo-information services at all levels means high resilience of community or individuals



(Pokharel, 2014)

GEO-INFORMATION
SPATIAL DATA

- Maximum data availability and suitable processing
  - International Charter on space and major disasters (established in 2000 by three major space agencies) – European, French and Canadian space agencies: now 22 organisation.
  - The charter is active for rapid onset in hydrological (floods), climatological (typhoons, hurricanes, drought), geophysical disasters (earthquakes, landslides) and signficant oil spells.

GEO-INFORMATION
APPLICATIONS

- In 2010 Haiti earthquake
  - A strong focus on multi image data sets
  - Civilian satellite images, 40cm resolution standard for damage mapping,
  - Airborne pictometry (imagery with four oblique views and a vertical) provides and better extra information for damage mapping
- In Port-au-Prince, google map maker and OSM drew more attention to volunteers providing needed base map for disaster response and rehabilitation work.

GEO-INFORMATION
APPLICATIONS

- After 2010 Shenzhen earthquake in China, the first institute of Photogrammetry and Remote sensing (based in Xi'an) deployed a UAV within a day.
- But it had to wait for airspace clearance during the emergency phase.
- However, UAVs minimizes the cost and allows for straightforward visual analysis of the images as an early intelligent source

Thank you for attentions