

Landslides Management in Nepal

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- **Overview**
- **Effects and impacts**
- **Control measures**
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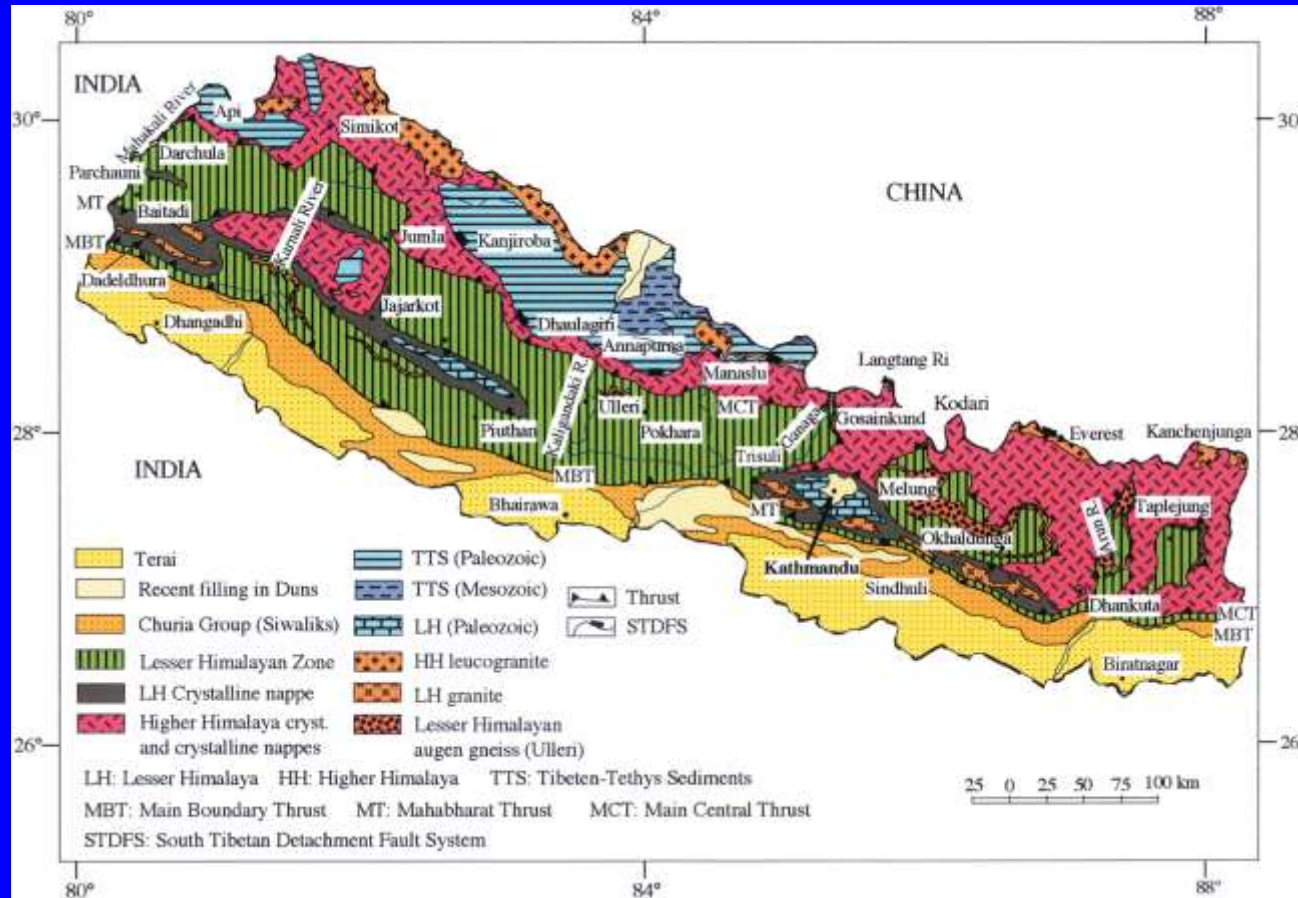
Overview

- **Landslides are local events**
- **Occurs almost everywhere**
- **Causative factors and Triggerring factors**
- **Broadely: naturally occurring and human-induced**



Overview.....

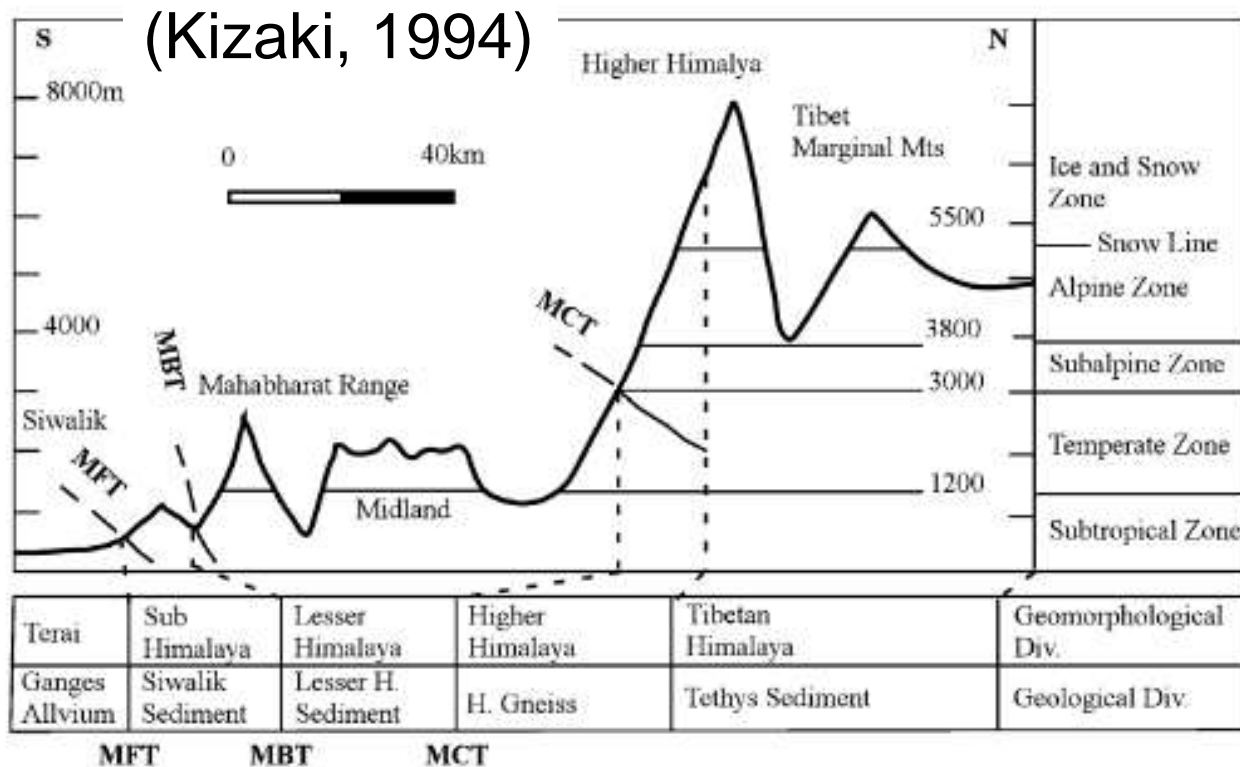
Naturally occurring landslides
Geology, Physiographic, Climate



Geological Map of Nepal (Upreti and Le Fort, 1999)

Overview....

Naturally occurring landslides Geology, Physiographic, Climate



N-S topographic profile of Nepal

Overview....

Human-induced landslides

Deforestation; Irrigation;
Road construction; Terrace
cultivation; Quarrying, etc.



Effect and Impact of Landslide

- Loss of lives
- Damage to physical infrastructures
- Damage to cultivated land / forests
- Damage to drinking water sources
- Increasing sediment load in rivers
- Damming rivers and valleys



Large Karli Lake
Nov.22, 2005

Landslide Control Measures

- **Evaluation of the landslide hazard and risk**

Based on landslide risk maps, past landslide history, by visual and preliminary evaluation, or based on a detailed engineering geological analysis.

- **Non-structural measures** : Political, Legal, Administrative measures

Awareness raising, Land use planning, Early warning system, sharing of risk through insurance, etc.

- **Structural and geotechnical measures**: Both external and internal stabilization measures

Retaining wall, ground modification, rock bolting /anchoring, ground water draining, soil nailing, etc.

Limitations in Landslide Management

- Lack of harmonized methodology for:
 - Landslide inventory,
 - Landslide hazard and vulnerability analysis,
 - Landslide risk assessment, and
 - Selecting preventive/mitigation measures,
- Lack of a data sharing platform
- Lack of relevant policies, plans, regulations, guidelines, acts, etc.
- Limited human resources

Limitations-examples



Can we go back to our school now?

How to define hazard/risk zone ??

Rock bolting / anchoring / netting/
Rock block removal???

Shifting of the village and school ??

Limitations-examples

Landslide did not occur this rainy season, so can we go back to our village ?

Slope monitoring or visual evaluation?



Way Forward

- **Harmonized methods for studying landslides comprehensively**
- **Training and capacity building programs for young professional**
- **Improvement of academic curriculum in universities**
- **Creation of data sharing platform for all of us**
- **Workshop contributes for exchange of knowledge, mutual cooperation and joint collaborative research for landslide study in Nepal**

**Thank you very much for your kind
attention !!!**

