



Progress of tools of landslide research in the past 10 years

*New technique

LIDAR, airborne & ground based
InSAR
Ground Penetration Rader (GPR)
High precision surface wave exploration
Passive seismology
Internet tools

*Sophisticated monitoring system

Ground water monitoring system
GPS for slope movement
Seismic monitoring
Dynamic monitoring in displacement

*Progress of laboratory experiments

measurement technics in
laboratory
Ring shear test apparatus

Progress of landslide research in the past 10years

*New interest findings

Preferential flow path way (Pipe flow)
Weathering profiles and soil formation rate
Grain crushing during landslide movement
Deep Seated Gravitational Deformation in rock slope
Landslides of anthropogenic fill slopes in urban region

*New Concept (research fields)

Observation based modelling
Combination Geotechnology and Geology
Cultural historical studies of geo-hazards (landslides,
liquefaction by historical earthquake,,,,)

Identified research gaps and needs

Landslide Research

Performance of water in unsaturated zone, air pressure trapping

Why does the slow and high speed movement exist ?
Why does the movement rate change ?

How was debris flow initiate from landslide ?

What is the hydro-geological structure in large-scale landslide ?

What is the effect of climate change ?

How can we make prediction model ?

Accurate seismic monitoring on slope

Geotechnology

Numerical analysis in heterogeneity

Identified research gaps and needs

Education

Communication gap between scientist and residents

Knowledge on background of relevant environmental interactions- geomorphology, hydrology, geology, soils and even biology- should be provide in residential area

Early warning

Early warning system should be developed

Training of warning system should be necessary

Urban Planning

Too complicated land use in urban region will be a main case of geo-disasters

Urban planning should be improved using research achievements in geo-hazard fields

Human Impact

Climate change will change the pattern of geo-disasters

Cascading disasters should be considered

Research challenges and possible outcomes

Road map on geo-hazard science - we have a dream -

