

## Landslide & Mudflow Mitigation

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### Introduction

Landslides are more widespread than any other geological event. They are defined as down slope transport soil and rock resulting from natural phenomena or man made actions. There can be different types of movements: falls, slides, topples, lateral spread, and flows. Landslides can be the secondary effects of heavy storms, volcanic eruptions and earthquakes.

### Public health significance

Landslide and mudflows can cause death and injury.

### Direct impacts

Landslides cause high mortality and a few injuries: trauma and suffocation by entrapment are common. Short and long term mental health effects are also observed. There may also be severe damage or total destruction of essential services (water system, hospital, health centre, energy and lines of communication) lying in the path of the landslide.

### Indirect impacts

Indirect effect can include loss of property value, livestock, crops, increasing the vulnerability of the population reducing their coping and caring capacities.

### Action to take

Mitigation measures range from community education to monitoring, warning and evacuation systems.

#### Before the disaster

- Get a ground assessment of your property.
- Minimise home hazards (plant ground cover on slopes, build retaining walls, and in mudflow areas, build channels or deflection walls to direct flow around buildings).
- Recognise landslide warning signs:  
  
Doors/windows stick or jam for the first time, new cracks appear in plaster or foundations, outside paths, walls, or stairs pull away from buildings, underground utility lines break, bulging ground appears at base of a slope, ground slopes downward in one direction and may begin shifting in that direction under your feet, faint rumbling sound that increases in volume as landslide nears.
- Make evacuation plans, planning at least two routes allowing for blocked and closed road.
- Develop and emergency communication plan and ask an out of state relative or friend to serve as the family contact.

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- Purchase flood insurance.

### During the disaster

If indoors:

- Stay inside and get cover under a sturdy piece of furniture.

If outdoors:

- Try to get out of path of mudflow
- Run to nearest high ground in a direction away from path
- If rocks and other debris are approaching, run for nearest shelter such as a group of trees or a building.
- If escape is not possible, curl into a tight ball and protect your head.

Be cautious of sinkholes:

- Sinkholes occur when groundwater dissolves a vulnerable land surface such as limestone, causing the land surface to collapse from lack of support.

### After the disaster

- Stay away from slide area.
- Check for injured and trapped persons and give first aid where needed.
- Listen to battery-operated radios for emergency information.
- Remember flooding may occur after a mudflow or landslide.
- Check for damaged power and the telephone lines and report damage to the utility company.
- Check the building foundation, chimney and surrounding land for damage.
- Replant damaged ground as soon as possible since erosion caused by loss of ground cover can lead to flash flooding.

## Acknowledgement:

Information for this document was sourced from the Department of Emergency and Humanitarian Action WHO/Geneva and Central Population Health Unit Disaster Plan.

## Related links:

- Emergency Management Australia Community Awareness Publications at website: [www.ema.gov.au/www/emaweb/emaweb.nsf/Page/Publications](http://www.ema.gov.au/www/emaweb/emaweb.nsf/Page/Publications)
- Emergency Management Queensland (EMQ) at website: [www.emergency.qld.gov.au/emq/css/beprepared.asp](http://www.emergency.qld.gov.au/emq/css/beprepared.asp)
- Workplace Health & Safety Queensland at website: [www.deir.qld.gov.au/](http://www.deir.qld.gov.au/)