

“LET’S LEARN ABOUT LANDSLIDES”



Landslides



Introduction to landslides:

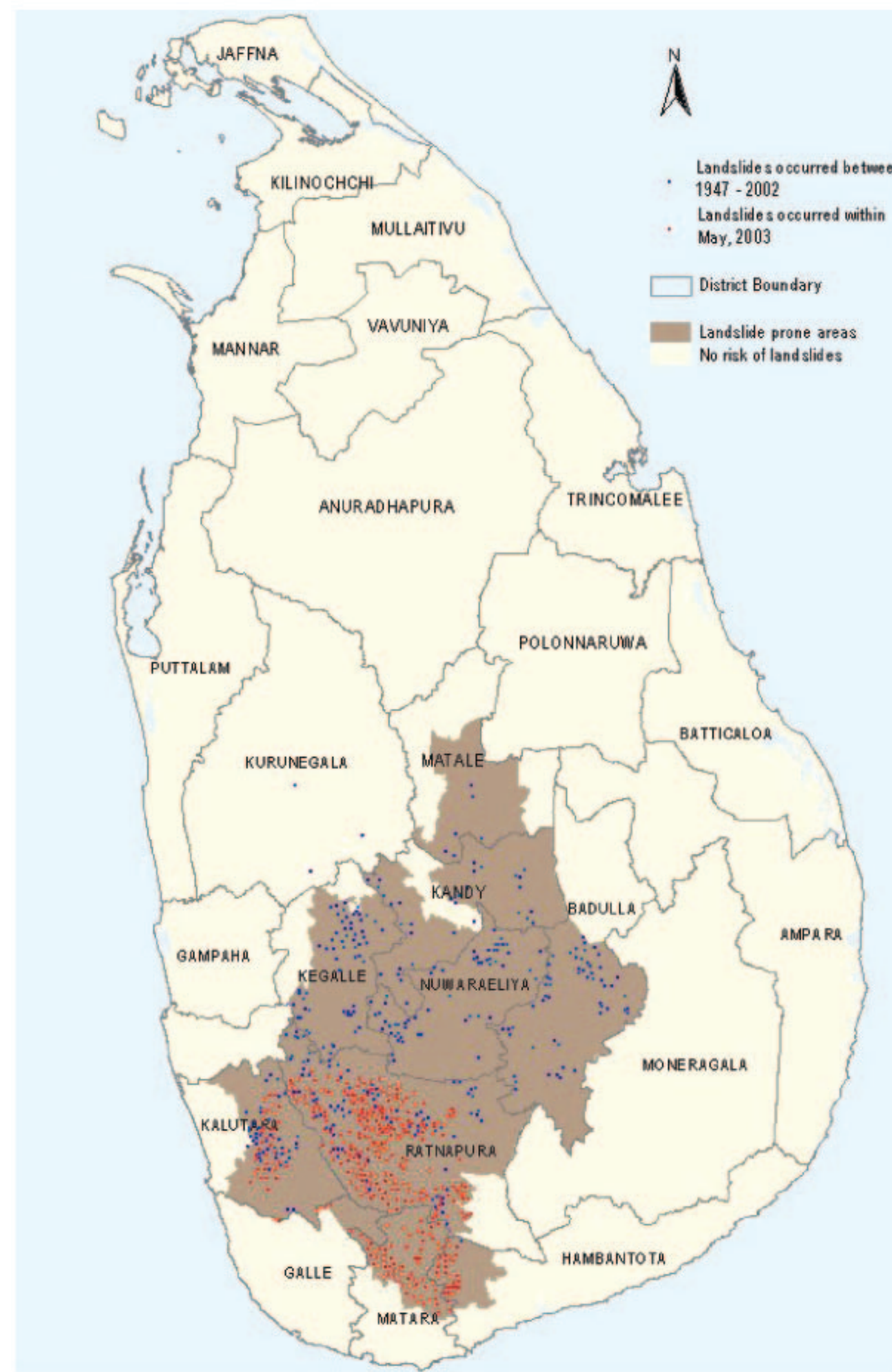
A landslide is a movement of a mass of rock, earth or debris down a slope. Landslides can kill people and destroy property.

This landslide in Abepura, Palawela killed 75 people and destroyed more than 35 houses. It also filled a paddy field with the material it brought down the slope.

That tells us that landslides can cause an impact on our lives, resources, employment and economy also.

Therefore, let's learn about how a landslide can occur and what we can do to prevent or minimize the anticipated damage.

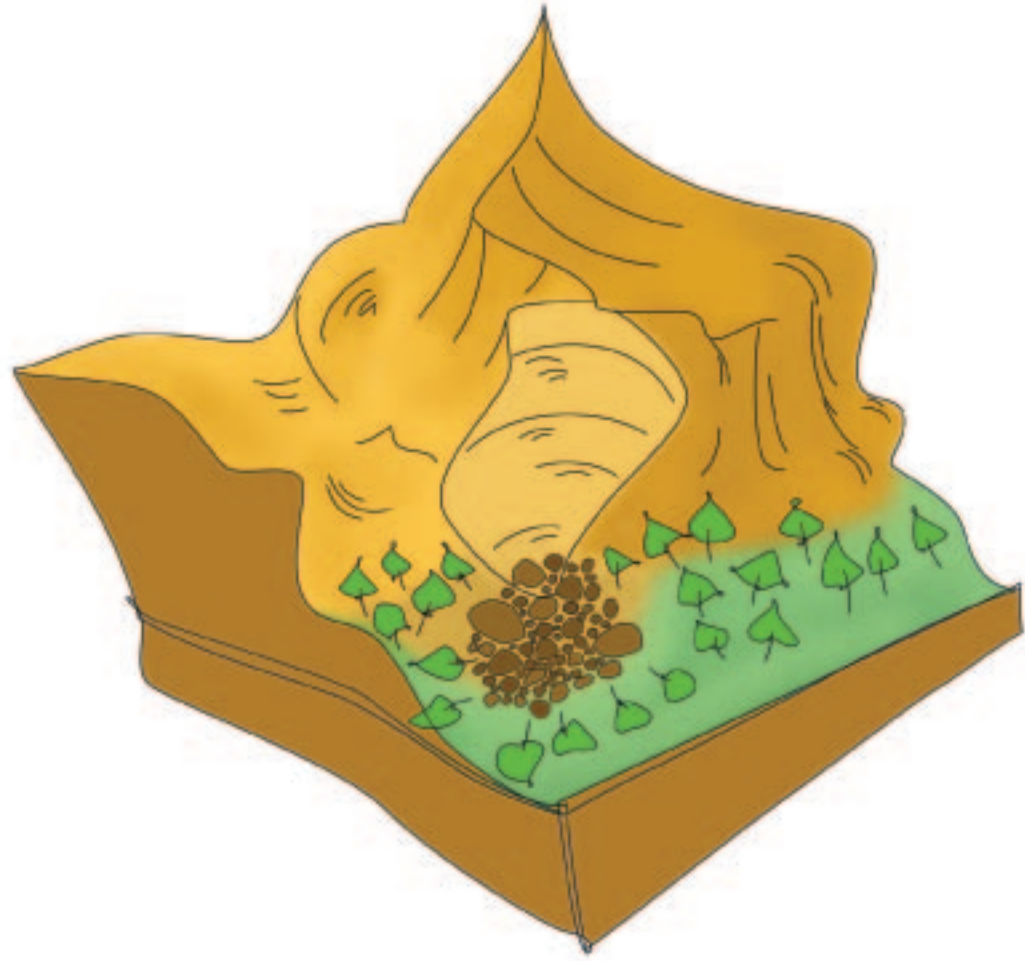
Landslide Prone Areas in Sri Lanka



INFORMATION ON A FEW SIGNIFICANT LANDSLIDES IN SRI LANKA

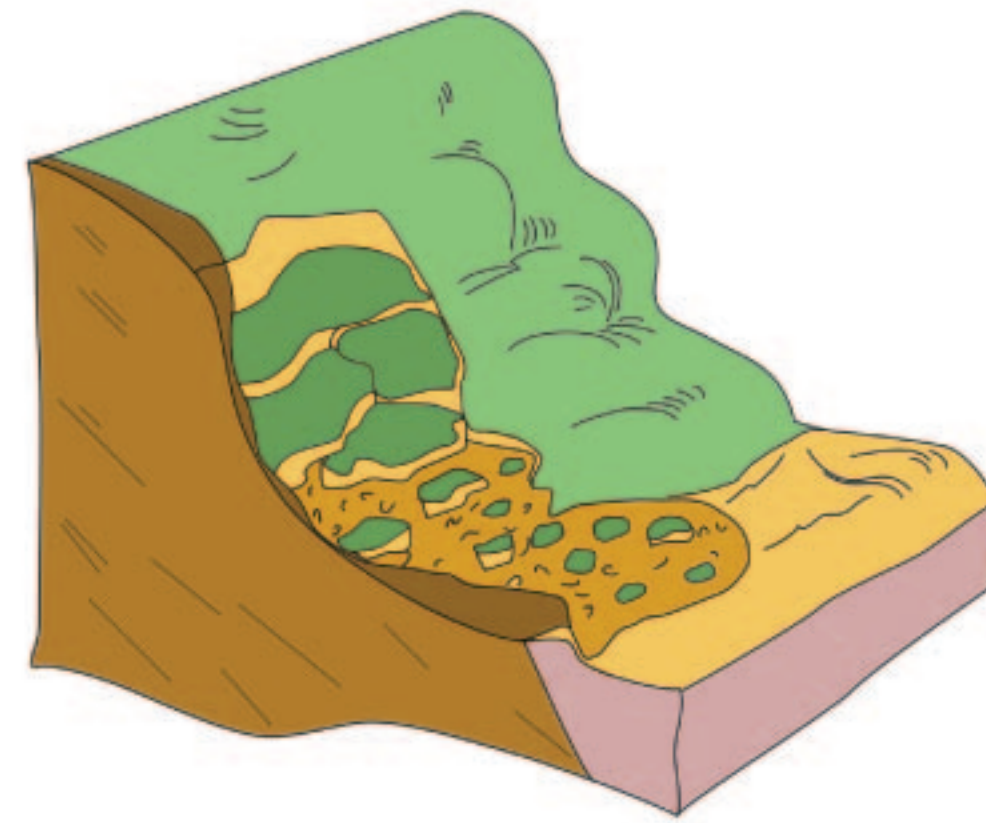
	DISTRICT	LOCATION OF THE LANDSLIDE	DATE OF OCCURRENCE	DAMAGE
1	Ratnapura	Pathulpana kanda	June 08, 1982	9 deaths and damages to 3 houses and tea planted land
2	Badulla	Naketiya, Koslanda	July 1995 and November 19, 1997	Road traffic interrupted for weeks due to the damages on roads A16 and A4. (This the largest landslide in size in Sri Lanka)
3	Kegalle	Thiyambarahena, Malmaduwa	May 1985	10 deaths and property damages
4	Nuwara Eliya	Ketiya pathana, Mathurata	January 06, 1986	13 deaths and damages to 2 houses
5	Matale	Palindagama, Pansalthenna	October 02, 1982	11 deaths and damages to 10 houses
6	Kandy	Weldambala, Pooliyadda	May 16, 1995	School building, a part of the irrigation system and 28 houses were destroyed
7	Hambantota	Saputhanthri kanda	May 17, 2003	19 deaths and damages to 5 houses
8	Matara	Diyadawa	May 17, 2003	19 deaths and damages to houses
9	Galle	Kolonthuduwa, Lankagama	May 19, 2003	3 houses and the temple were destroyed
10	Kalutara	Siridolawatta	June 01, 2008	4 deaths and property damages

Different Types of Landslides



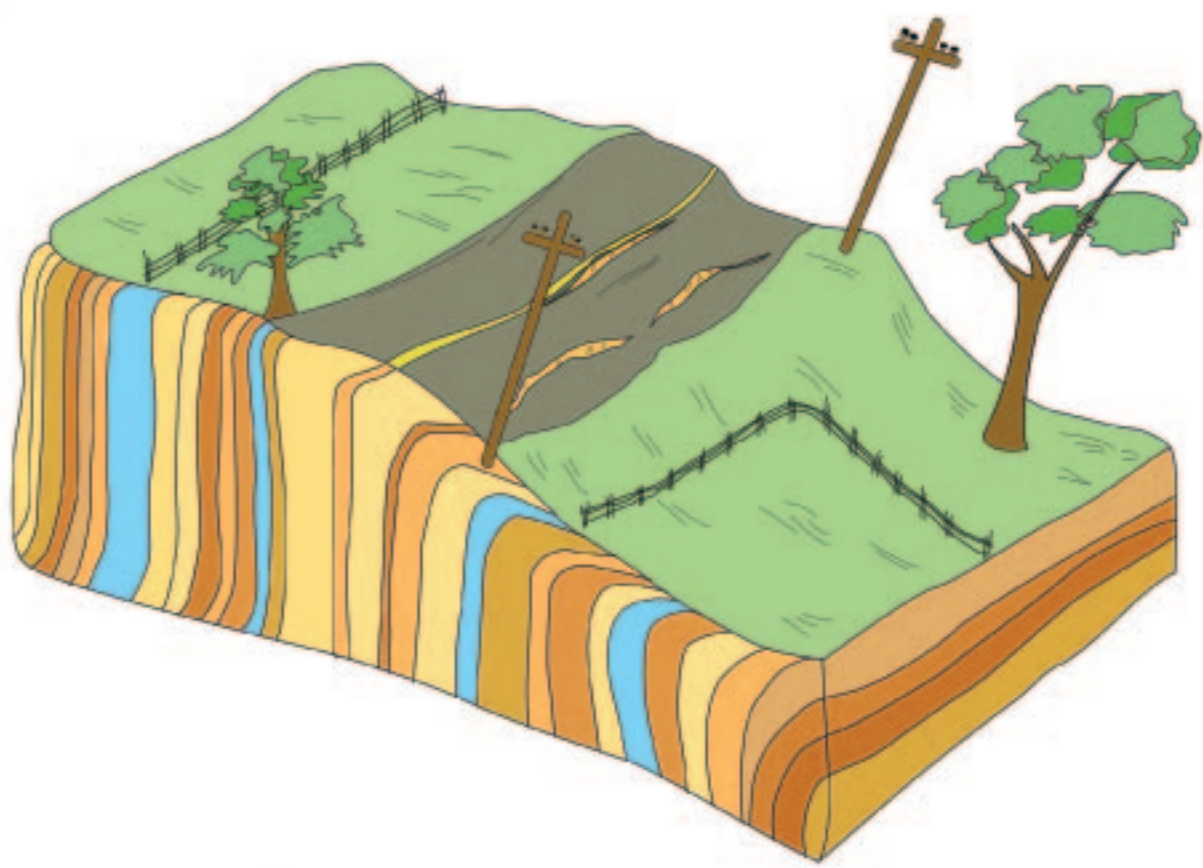
● Rock Fall

Falling of rock down a slope



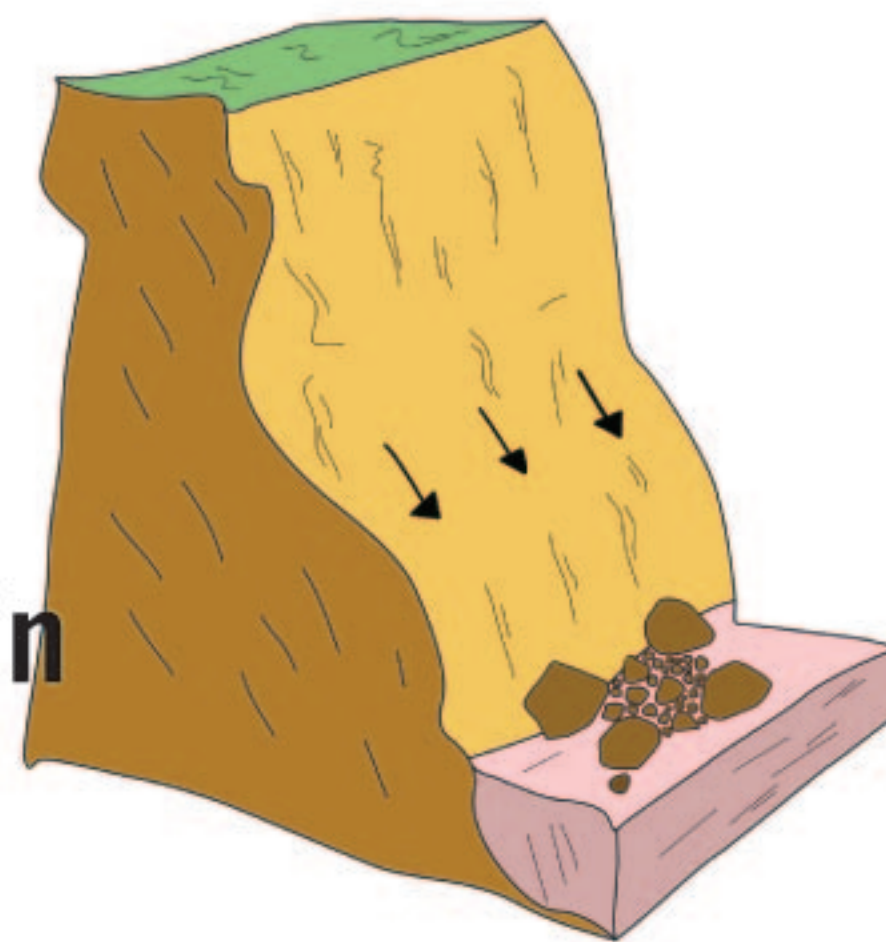
● Debris Slide

Sliding down of rock and soil alongwith the trees and other material which were on them.



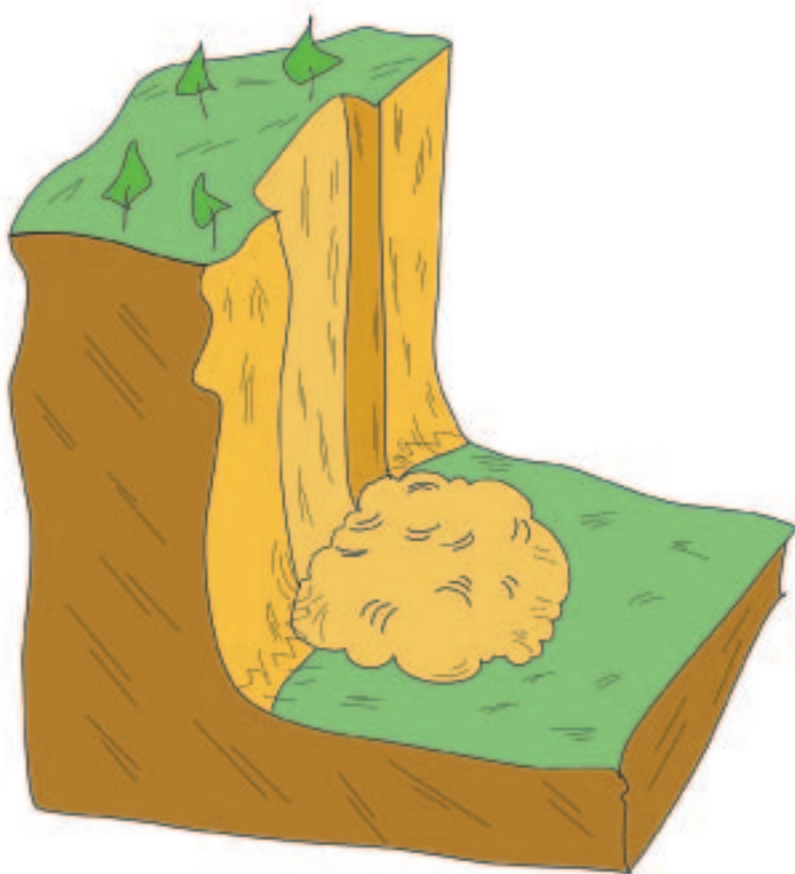
● Creep

A very slow movement within a slope



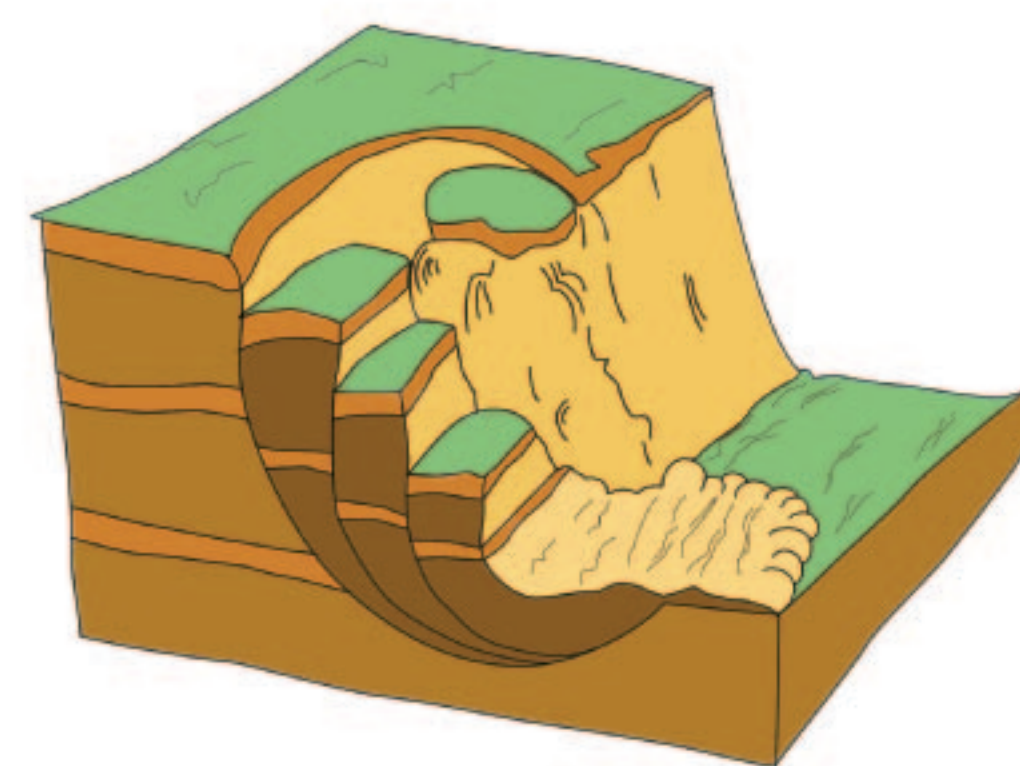
● Rock Slide

Sliding down of rock as sheets



● Debris Fall

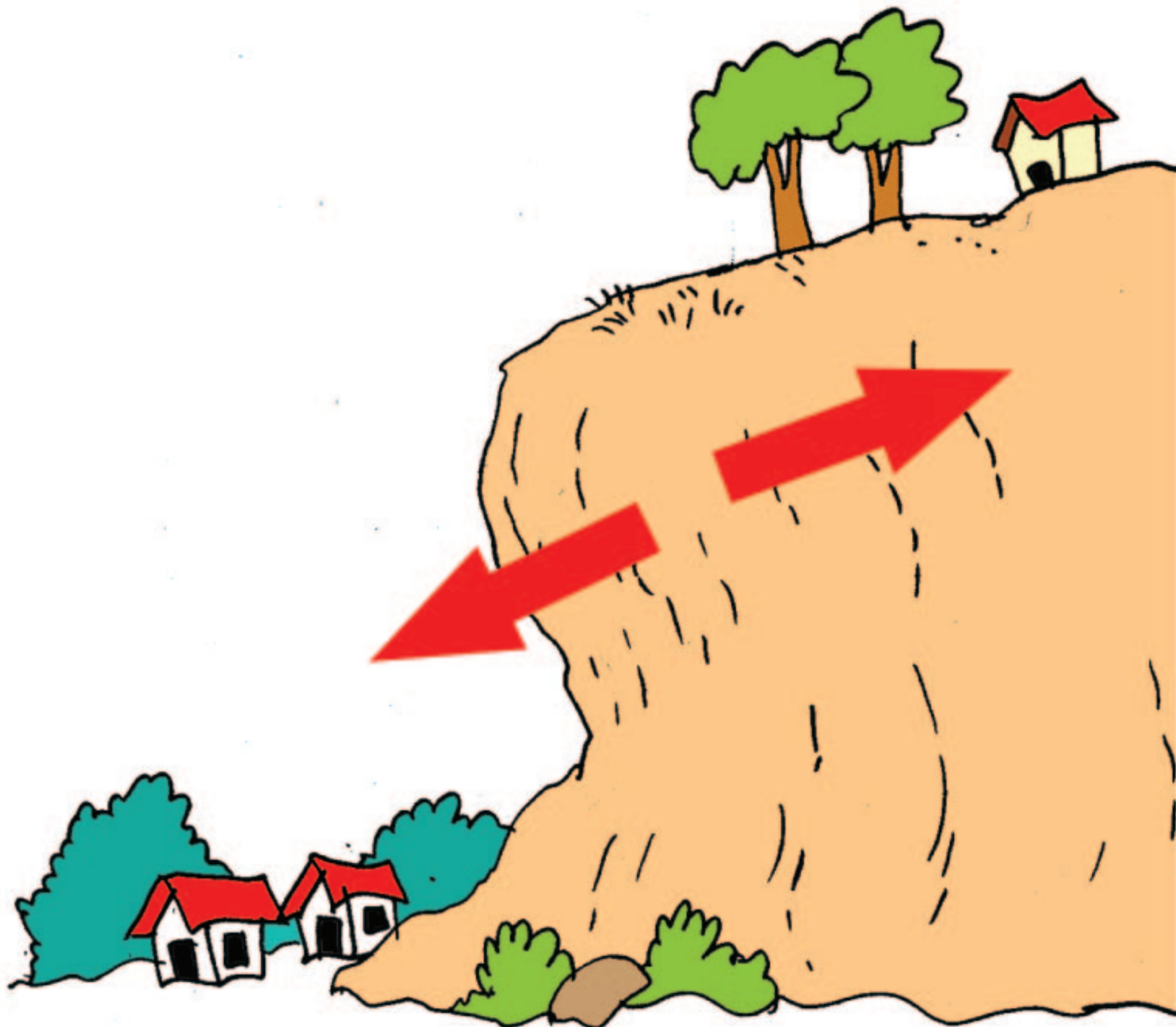
Falling down of rock and soil along with the trees and other material which were on them.



● Rotational Slide

Sliding of soil layers rotationally down a natural or man made steep slope

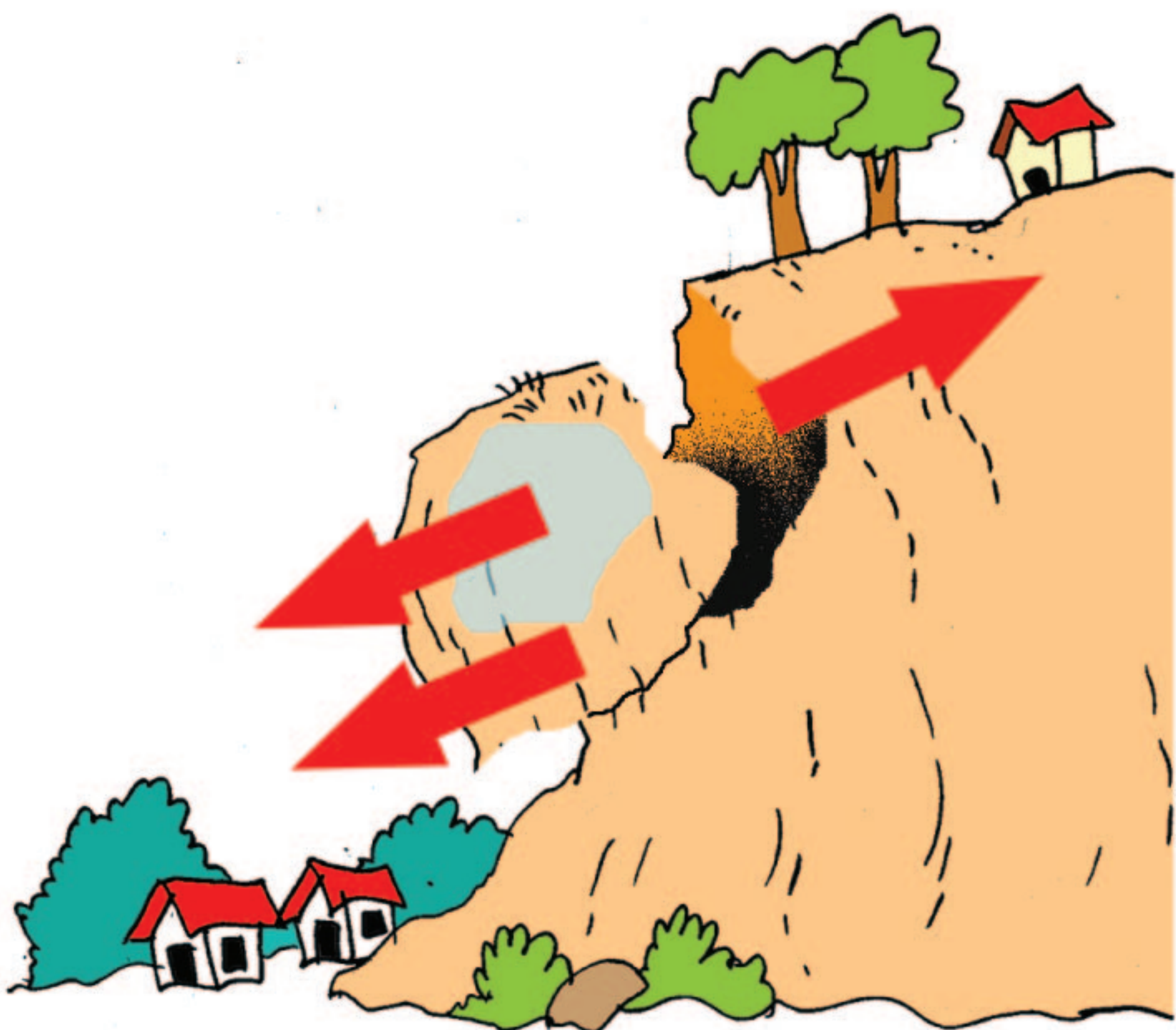
Mechanism of Landslides



- On a hill slope, there are forces such as the weight of the soil mass which act downward as well as the forces such as friction which act upward. On a stable slope, those upward forces balance the downward forces.



- Because of the weight and the pressure of the infiltrated rain water, the forces that act downward will be increased.

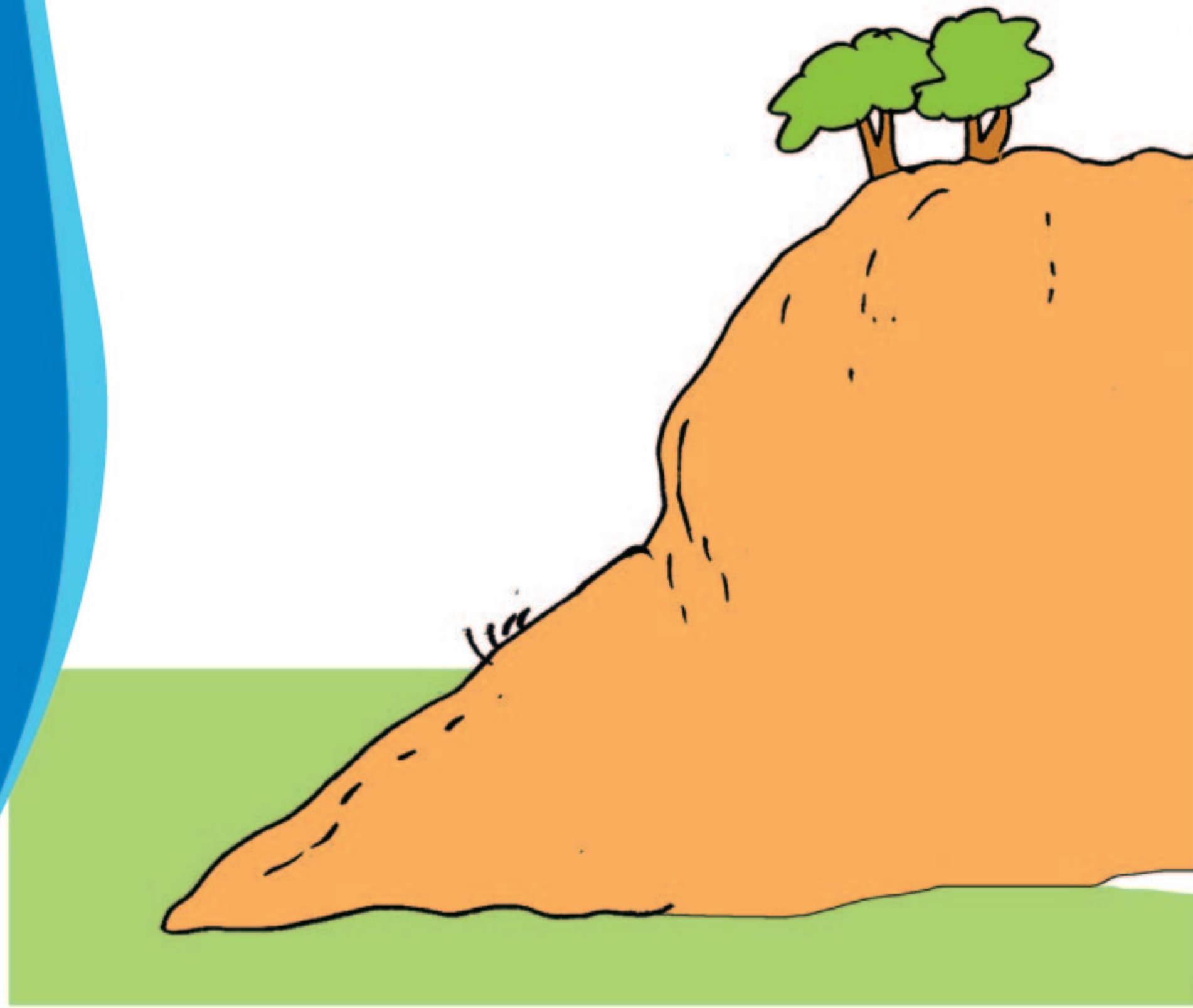


- At the moment when the downward forces are higher or stronger than the upward forces, the balance between those forces will be lost and the soil or rock mass will move down the slope.

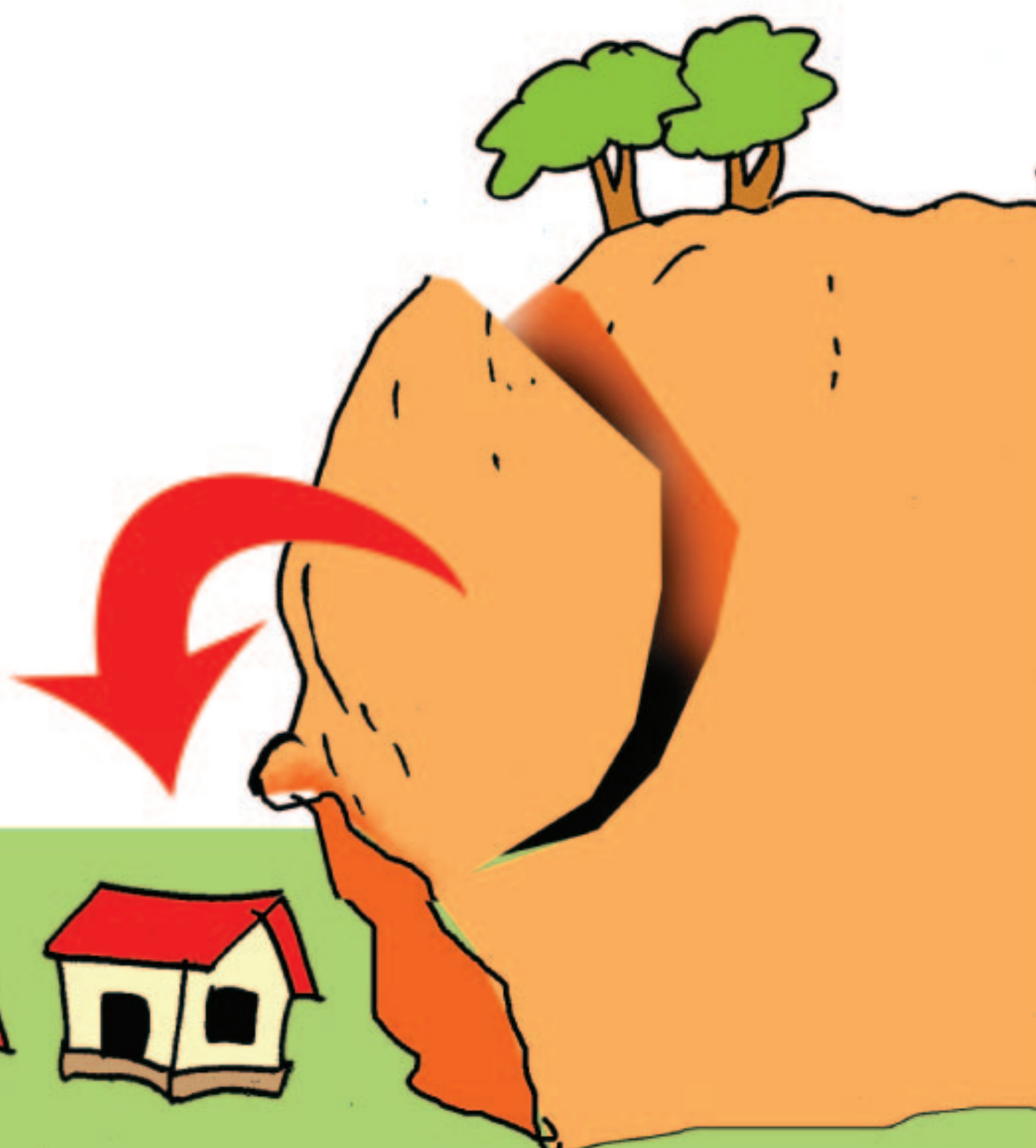
Landslides Occured Due to Natural Causes



Landslides Occur Due to Inappropriate Human Activities



- Certain human activities associated with hill slopes may destroy the natural force balance within that slope.



- Making steep cuts on hill slopes for construction of houses removes part of the soil or rock which naturally supported that slope at the toe region.
- As a result, the upper slopes eventually fail and slide down.

Other Human Activities that Causes Landslides



- **Uncontrolled rock quarrying and blasting**



- **Blocking natural water ways**



- **Removal of forest cover or arson**



- **Retaining water on upper slopes**



- **Unplanned land use**

Landslides that Occurred Due to Inappropriate Human Activities



- 1. A steep cut made on the slope for road construction had lead to this landslide in Baduraliya.**



- 2. This landslide in Kapala kanda, Ja Ela had been created due to a steep cut made on the slope**



- 3. This landslide in Kapala kanda, Ja Ela had been created due to construction of houses on a natural water path.**



- 4. This landslide in Bandarawela town was caused by illegal construction at an unsuitable place.**

Some Landslides Can Slide Several Times



Hela Uda Landslide

**First occurred in 1993
Reactivated in 2003 and
again 2006**

**When this landslide was
first occurred in 1993 it
Killed 48 people and destroyed 12
houses**

Buried

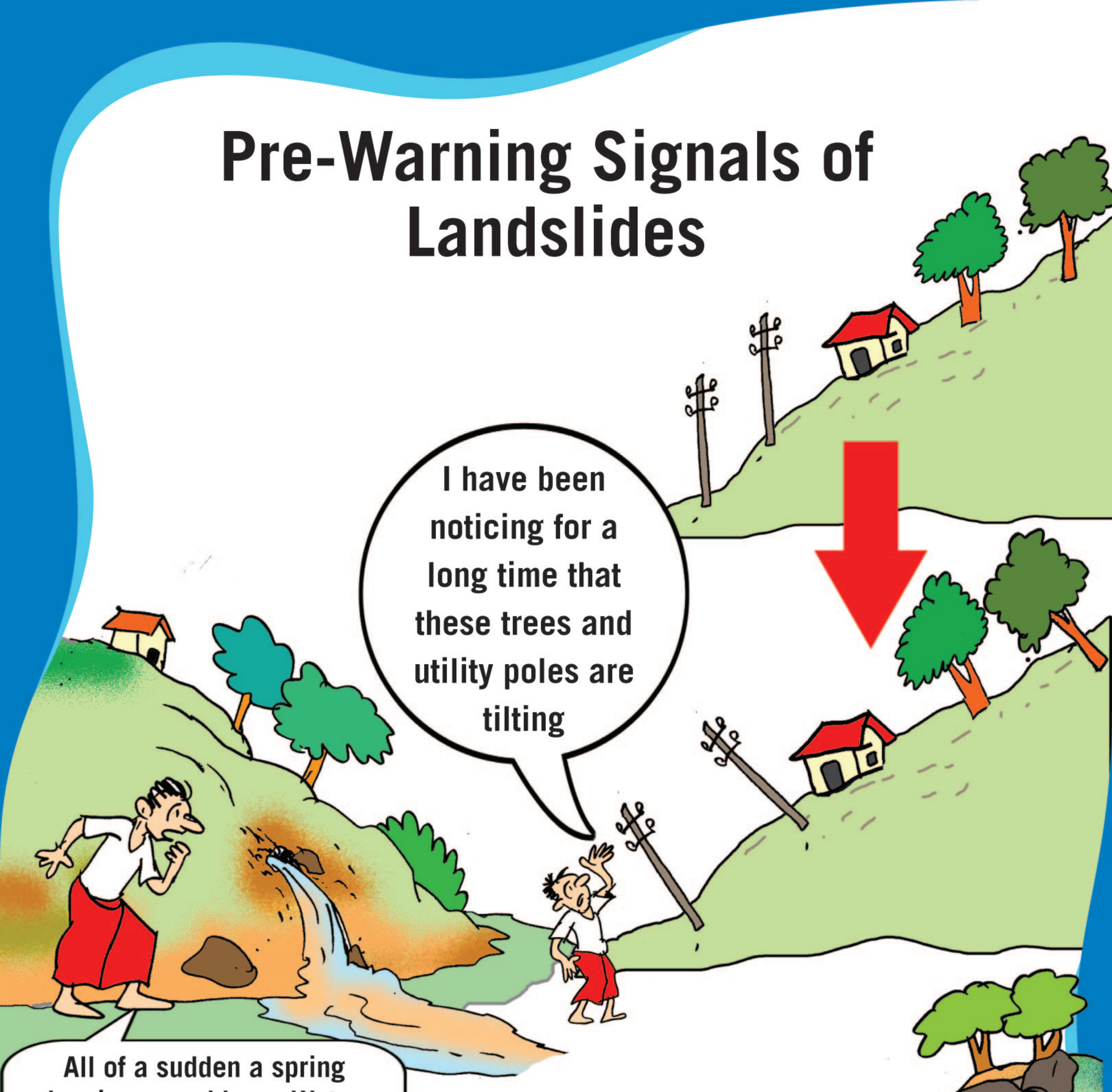
**1 hectare of paddy
4 hectare of coconut and
several home gardens,**

Damaged

**About 350m stretch of main road,
a culvert, utility poles.**

**Power supply and
telecommunication also
were interrupted**

Pre-Warning Signals of Landslides



I have been noticing for a long time that these trees and utility poles are tilting

All of a sudden a spring has immersed here. Water looks muddy.

My walls and floors are cracked. There are cracks on the ground outside



Rock cliffs are spurting



What Can We Do to Prevent or Minimize Damages from Landslides



- Construction of retaining walls



- Replanting on exposed slopes



- Appropriate land use



- Application of good drainage system

What Can We Do to Prevent or Minimize Damages from Landslides



1. **Avoid selecting land with past landslides for building houses.**



2. **Avoid making deep cuts on slopes for building houses and roads.**



3. **When building on slopes, always select a house plan that will need minimum slope modifications.**

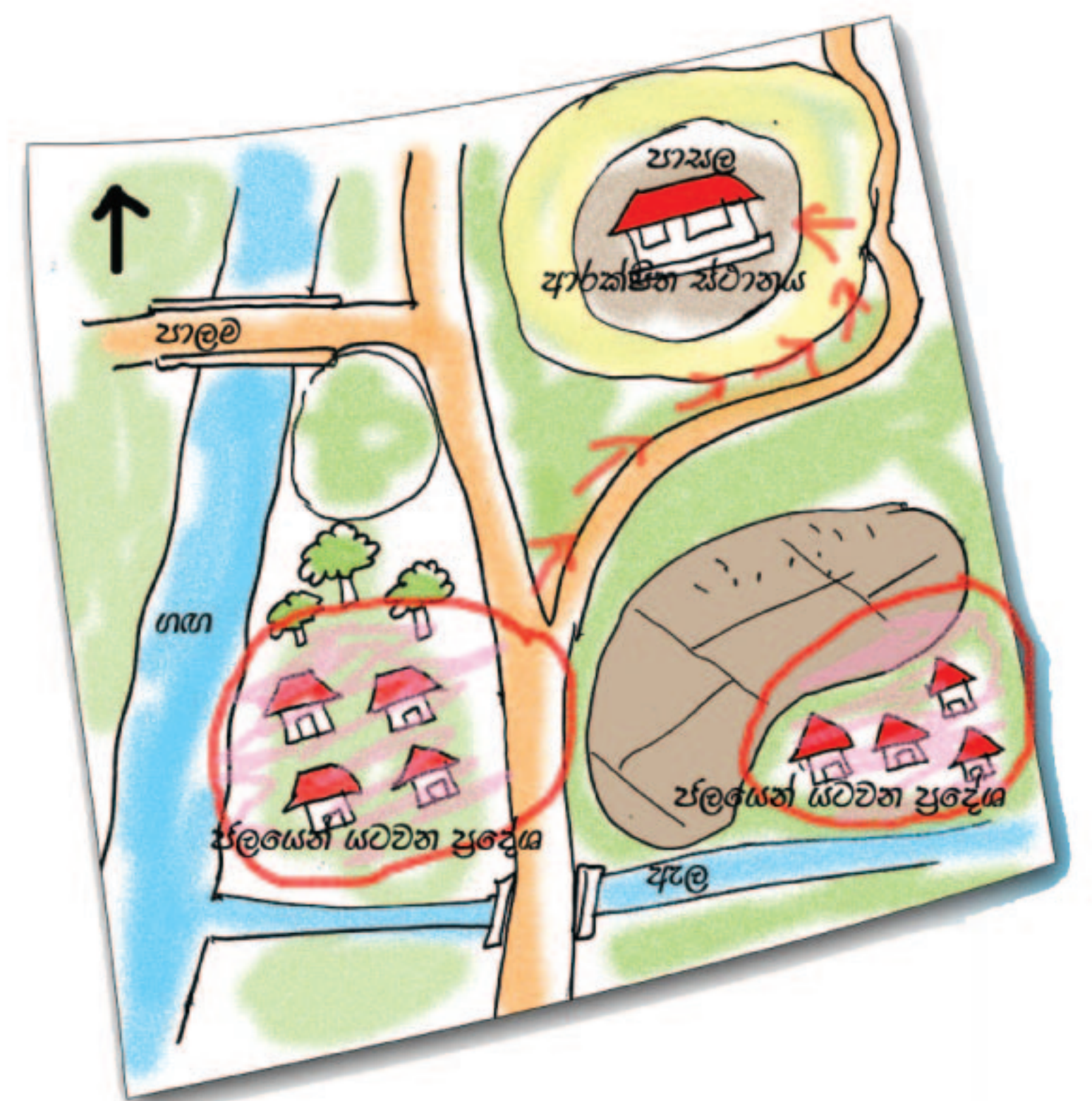
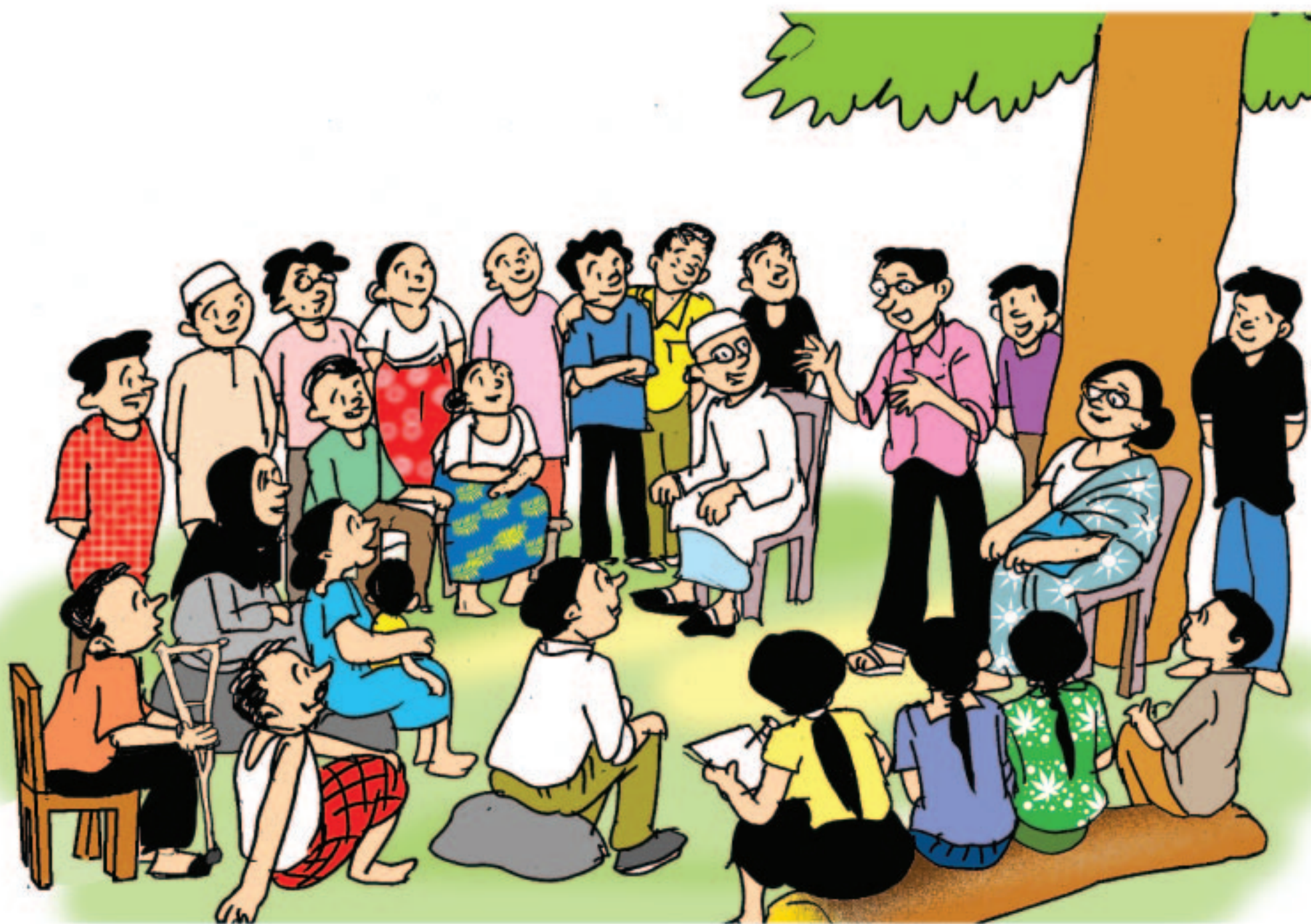


4. **Protect the slope cuts using retaining walls and controlling erosion**

Establish a Community Based Disaster Management Committee

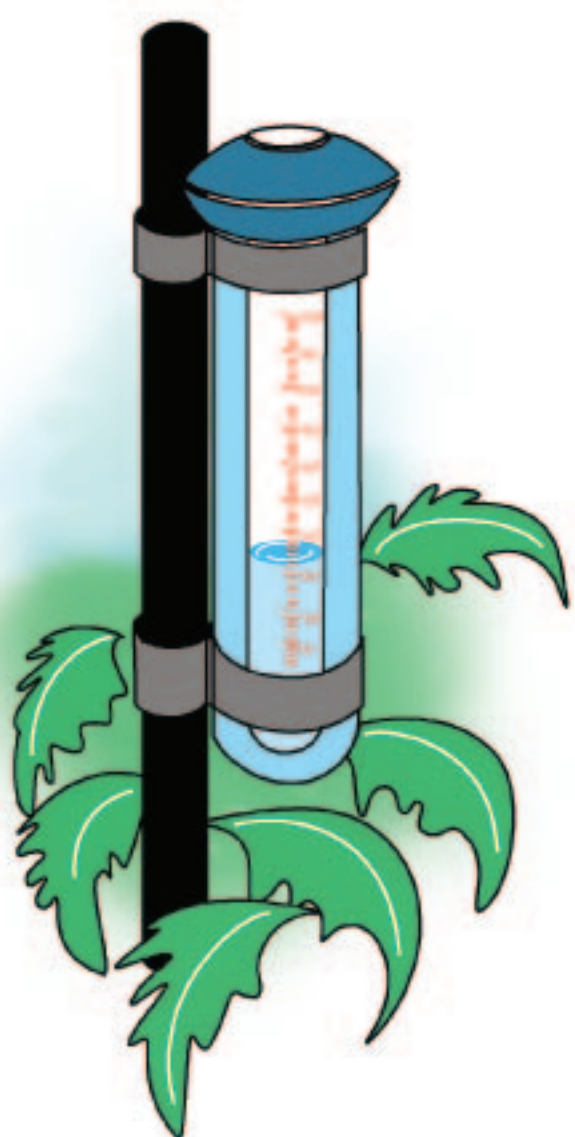


- Make frequent checks to identify any warning signals of landslides. Take actions to prevent inappropriate land use, if practiced in your area.



- Evacuate to a safer place
- Measure rainfall

- Identify safe places for evacuation during a disaster situation

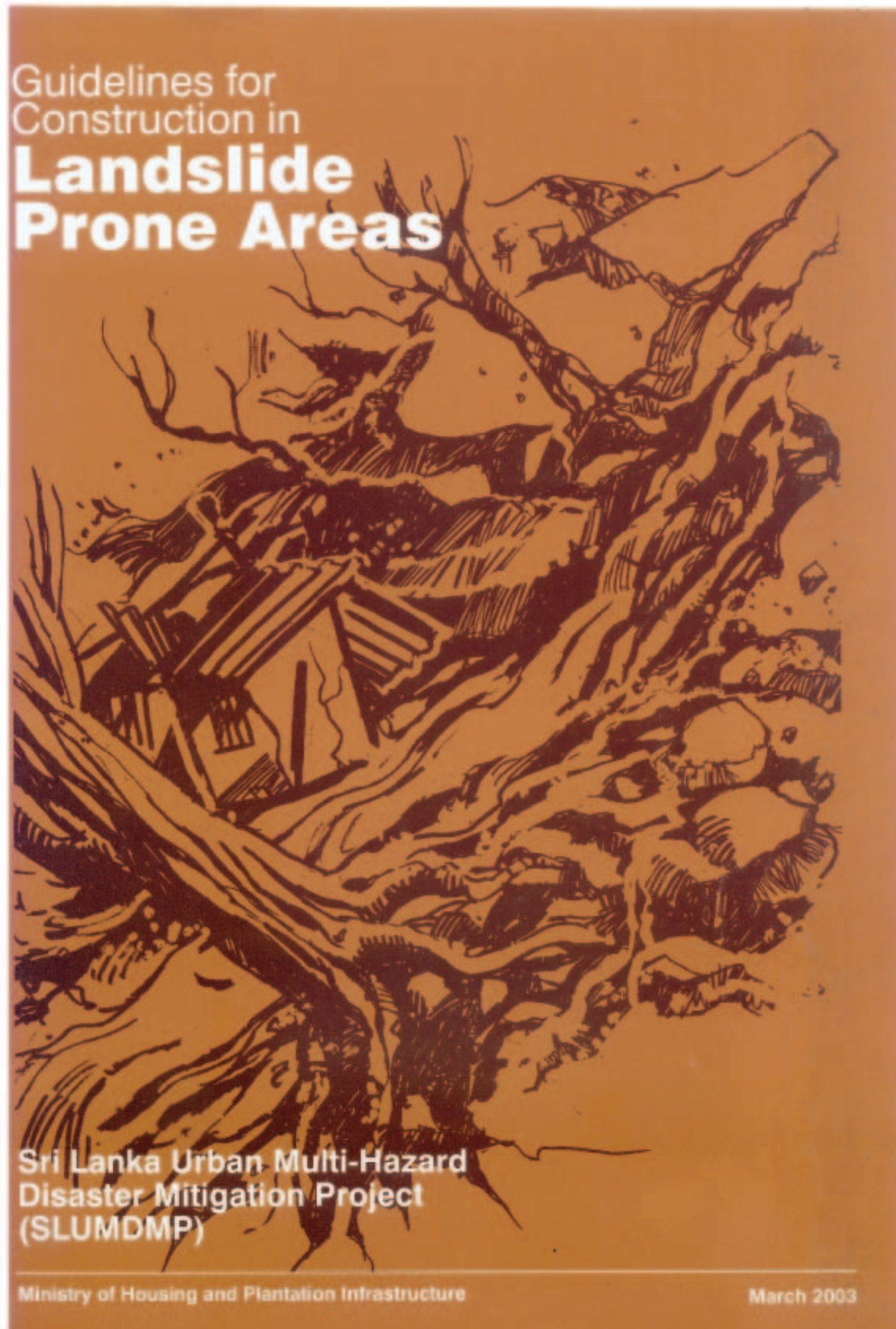


● Rain Gauge

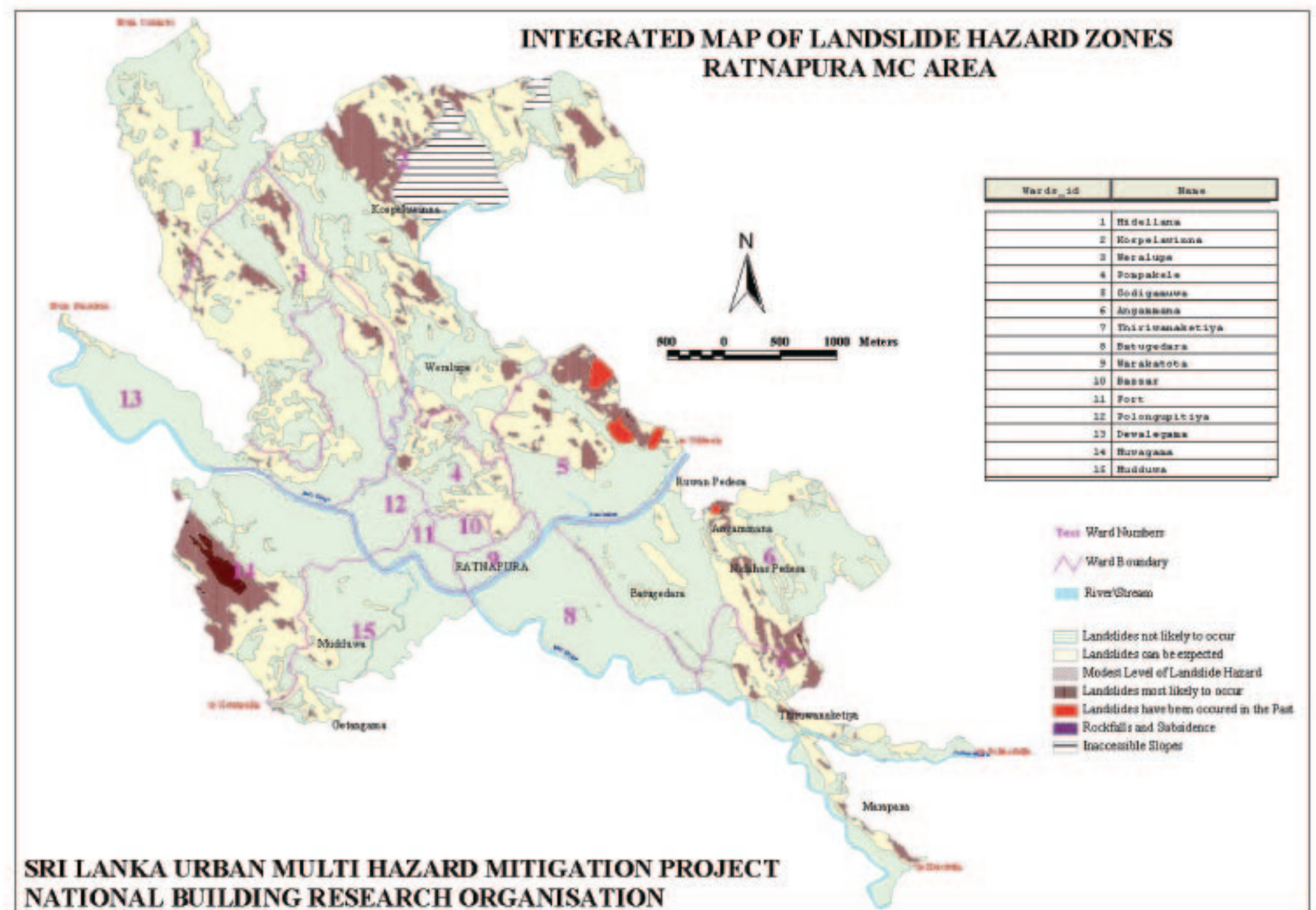


- Establish a simple communication system to disseminate warning messages.

Follow Construction Methods Suitable for Hill Slopes



- **Contruaction Guidlines**



- **Maps**



- **Model house built in Goluwavila, Ratnapura**