Others

Did You See It??

Report a landslide!!!

Help us in collecting information on landslides that we may not know about.

(Already an online form exists in the portal…that may be maintained)

Sl No	Item	
1.	Date & Time of occurrences	
2.	Location	
	i.	Village/ Town
	ii.	Tehsil/ Taluka
	iii.	District
	iv.	State
	v.	Geographic Co-ordinates in Latitudes/ Longitudes and Toposheet No
3.	Dimension (m)	
	i.	Length
	ii.	Breadth
	iii.	Height
4.	Type of landslide	
	i.	Rockslide/ Fall
	ii.	Overburden slide/Fall
5.	History	
	i.	Old
	ii.	New
6.	Material involved	
	i.	Rock
	ii.	Overburden
7.	Whether in road cutting / river bank / natural hill slopes	
8.	Structure affected	
	i.	Road/ Railway line
	ii.	Houses
	iii.	Land (Barren/ Cultivated)
	iv.	Forest
	v.	Civil Projects
9.	Casualties	
	i.	Human
	ii.	Livestock
10.	Rainfall	
	i.	During last 24 hours
	ii.	During week prior to landslide
	iii.	If rainfall data is not available, local assessment may be given
11.	Causes of landslide (As per local assessment)	
12	Existing remedial measures and recommendations if any	
Reporting done by	Signature: Name: Address: E-Mail: Phone No:	

Landslide Inventory Mapping

The term landslide generally denotes the movement of a mass of rock, debris or earth down a slope due to the action of gravity. According to Encyclopedia Britannica (http://www.britannica.com/EBchecked/topic/ 329513/landslide), landslide, also called landslip, the movement down slope of a mass of rock, debris, earth, or soil (soil being a mixture of earth and debris). Landslides occur when gravitational and other types of shear stresses within a slope exceed the shear strength (resistance to shearing) of the materials that form the slope. Figure 1 below is a graphic illustration of a type-landslide, with the commonly accepted terminologies describing its features.

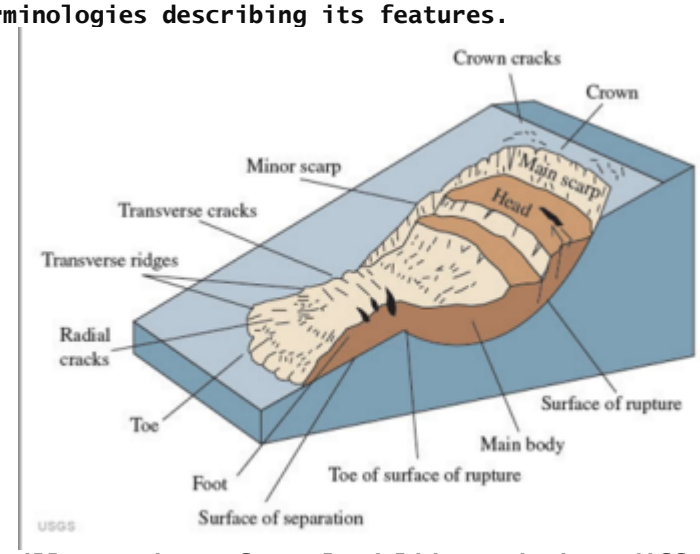

Fig. 1: A typical illustration of a landslide and its different features (after http://geology.com/usgs/landslides/)

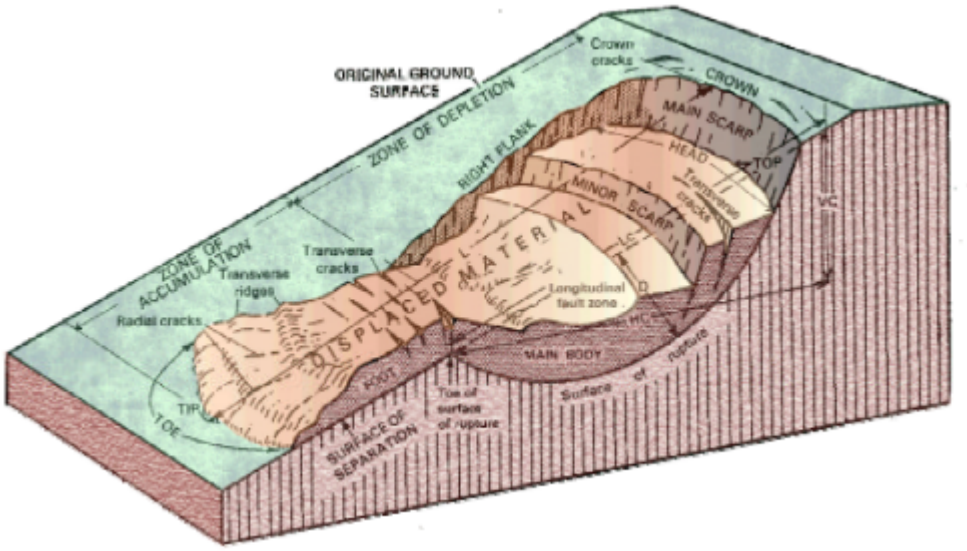

Fig. 2: Features and components of a typical landslide

Components and Dimensions

The standard landslide features, components and dimensions (Figs 1-2) are as under according to Table 1, as proposed and agreed by the UNESCO Working Party on World Landslide Inventory (1993):

Table 1: Components and Dimension of a typical landslide (UNESCO-WP/WLI, 1993) (also refer to Figs 1-2 & 3)

Features/ Components	
Feature/ Component	**Description**
Crown	The material that is (practically) still in place and adjacent to the highest parts of the main scarp.
Main scarp	A steep surface on the undisturbed ground at the upper edge of the landslide, caused by movement of the displaced material away from the undisturbed ground. It is the visible part of the surface of rupture.
Top	The highest point of contact between the displaced material and the main scarp.
Head	The upper parts of the landslide along the contact between the displaced material and the main scarp.
Minor scarp	A steep surface on the displaced material of the landslide produced by differential movements within the displaced material.
Main body	The part of the displaced material of the landslide that overlies the surface of rupture between the main scarp and the toe of the surface of rupture.
Foot	The portion of the landslide that has moved beyond the toe of the surface of rupture and overlies the original ground surface.
Tip	The point of the toe farthest from the top of the landslide.
Toe	The lower, usually curved margin of the displaced material of a landslide, it is the most distant from the main scarp.
Surface of rupture	The surface that forms (or has formed) the lower boundary of the displaced material below the original ground surface.
Toe of surface of rupture	The intersection (usually buried) between the lower part of the surface of rupture of a landslide and the original ground surface.
Surface of separation	The part of the original ground surface overlain by the foot of the landslide.
Displaced material	Material displaced from its original position on the slope by movement in the landslide. It forms both the depleted mass and the accumulation.
Zone of depletion	The area of the landslide within which the displaced material lies below the original ground surface.
Zone of accumulation	The area of the landslide within which the displaced material lies above the original ground surface.
Depletion	The volume bounded by the main scarp, the depleted mass and the original ground surface.
Depleted mass	The volume of the displaced material that overlies the rupture surface but underlies the original ground surface.
Accumulation	The volume of displaced material that lies above the original ground surface.
Flank	The un-displaced material adjacent to the sides of the rupture surface. Compass directions are preferable in describing the flanks but if left and right are used, they refer to the flanks as viewed from the crown.
Original ground surface	The surface of the slope that existed before the landslide took pl

Dimension (see Fig. 3)		
Id	**Type**	**Attribute**
1	Width of displaced mass (*Wd*)	The maximum breadth of the displaced mass perpendicular to the length (*Ld*).
2	Width of surface of rupture (*Wr*)	The maximum width between the flanks of the landslide, perpendicular to the length (*Lr*).
3	Length of displaced mass (*Ld*)	The minimum distance from the tip to the top.
4	Length of surface of rupture (*Lr*)	The minimum distance from the toe of the surface to the crown.
5	Depth of displaced mass (*Dd*)	The maximum depth of the displaced mass, measured perpendicular to the plane containing *Wd* and *Ld*.
6	Depth of surface of rupture (*Dr*)	The maximum depth of the rupture surface below the original ground surface measured perpendicular to the

		plane containing *Wr* and *Lr*.
7	Total Length (*L*)	The minimum distance from the tip of the landslide to its crown.
8	Length of center line (*Lcl*)	The horizontal component of the total length (*L*).

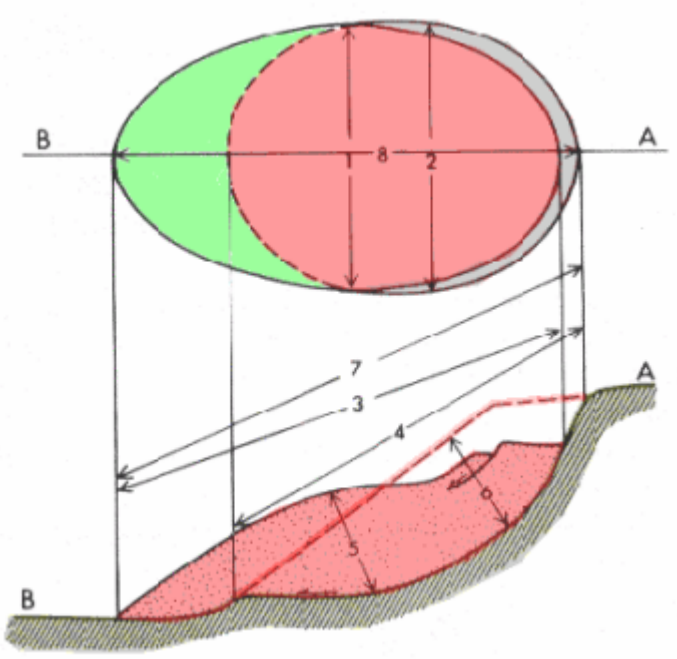

Fig. 3: Dimension of a landslide (with id marked, see Table 1 above)

Classification of landslide

In 1978, Varnes introduced a classification (Table 2) based on movement type and material involved which later became very popular and accepted by most of the landslide scientists around the world.

Table 2: Landslide classification proposed by Varnes (1978)

Type of Movement			*Type of Material*		
			Bedrock	Engineering Soils	
				Predom. Coarse	Predominantly Fine
Falls			Rock Fall	Debris Fall	Earth Fall
Topples			Rock Topple	Debris Topple	Earth Topple
Slides	Rotational	Few Units	Rock Slump	Debris Slump	Earth Slump
	Translational	Few Units	Rock Block Slide	Debris Block Slide	Earth Block Slide
		Many Units	Rock Slide	Debris Slide	Earth Slide
Lateral Spreads			Rock Spread	Debris Spread	Earth Spread
Flows			Rock Flow (Deep Creep)	Debris Flow (Soil Creep)	Earth Flow
Complex – Combination of Two or More Principal Types of Movement					

Landslide Category description

Category	Description	Stage
III	Landslides (Slides/ Falls/ Flows) and Subsidence that occur in the vicinity of inhabited areas and/ or any infrastructure that can adversely affect either humans or properties or any infrastructure. Landslides (Slides/ Falls/ Flows) and Subsidence that block smaller natural drainages and posing insignificant to limited risk to lives and properties. It may pose some amount of threat for future damage.	Yellow
II	Landslides (Slides/ Falls/ Flows) and Subsidence that occur and/or have damaging effects on inhabited areas, important and strategic infrastructures such as highways/ roads, pilgrimage routes, rail routes and other civil installations like any appurtenant structures of any hydroelectric/ irrigation/ multipurpose projects and that result either loss of lives or damage to any property.	Orange
I	Landslides (Slides/ Falls/ Flows) and Subsidence that occur and/or have affect on inhabited areas, important and strategic infrastructures such as highways/ roads, pilgrimage routes, rail routes and other civil installations like any appurtenant structures which result in significant losses of lives and properties. This category also includes large landslides that causes damming and blocking of major rivers leading to the possibility of breaching of dam and flooding of downstream low-lying areas (outcome of Landslide Lake Outburst Flow – LLOF)	Red