

A NOTE ON THE POST-DISASTER, PRELIMINARY ASSESSMENT OF THE REPORTED LANDSLIDE AT LAPTAP, PAPUM PARE DISTRICT, ARUNACHAL PRADESH

By:

K. Sekhose, D. Pieru (Geologists) & Enos Ezung (Sr. Geologist)
State Unit: Arunachal Pradesh, Geological Survey of India, NER, Itanagar.

As per the media reports a landslide occurred at Laptap village, Papum Pare district, Arunachal Pradesh on 11th July, 2017 at 14:30 hrs killing 14 people. Consequent to this media news, a team from Geological Survey of India comprising three officers from SU: Arunachal Pradesh, Itanagar visited the landslide site on 12.07.2017 for carrying out the on-spot, post-disaster preliminary study of the landslide. The GSI team held an informal meeting at the site of incidence, with the Circle-officer, Toru on 12.07.2017 for collecting the relevant information pertaining to the date and time of occurrence, loss to life and property, etc.

The studies carried out include a perspective assessment of the affected area as well as the adjoining slopes in terms of the slope morphometry, slope forming material, attributes of structural control, collection of the detailed landslide attribute data as per the recommended 41- point geo-parametric landslide inventory datasheet and other relevant geological parameters.

The field note incorporates the data collected from the DC Office, Itanagar and the observations made in the field.

41 POINT GEO-PARAMETRIC DATA SHEET

1	Slide No	AP/PP/83E12/2017/01
2	State	Arunachal Pradesh
3	District	Papum Pare
4	Toposheet	83E/12
5	Name of the slide	Laptap Landslide
6	NH/SH/locality	Trans Arunachal Highway, about 40 km south of the state capital Itanagar
7	Latitude	27° 12' 27.56" N (27.207659° N)
8	Longitude	93° 36' 57.04" E (93.615842° E)
9	Length	Approx. 50 m (scar)
10	Width	Approx. 45 m
11	Height	Approx. 38 m (max)
12	Area	Approx. 2,250 m ²
13	Depth	5 m
14	Volume	Approx. 14,500 m ³

15	Run out distance	Approx. 185 m
16	Type of material	Colluvial debris/loose soil with embedded boulders
17	Type of movement	Debris slide
18	Rate of movement	Very rapid
19	Activity	Active
20	Distribution	Confined with high possibility of retrogression
21	Style	Single
22	Failure mechanism	Translational along rock-overburden interface
23	History	Not available but some cutting is visible in Google Earth imagery of March 2017.
24	Geomorphology	The road cutting across the slope had exposed vertical section with the general slope of the area about 45°-50°
25	Geology	Colluvial deposit of loose boulders with soil (bedrock comprises quartz mica schist of Khetabari Formation of Bomdila Group).
26	Structure	None (bedrock not exposed in the vicinity).
27	Landuse/Landcover	<i>Landuse</i> : Recent widening of the road for construction of the Trans-Arunachal Highway. <i>Landcover</i> : Orange orchards at the crown slope.
28	Hydrological condition	Wet (saturated debris-soil due 4 days incessant rain prior to the landslide initiation).
29	Triggering condition	4 days antecedent rainfall.
30	Other factors	The slope has been recently excavated for road widening. A steep excavated slope was maintained.
31	Death of persons	14 persons
32	People affected	5 houses buried in slide and the villages connecting further Cut-off.
33	Live stock loss	Yes
34	Communication	Trans Arunachal Highway and village road are blocked.
35	Infrastructure	Yes
36	Agriculture/Forest/Barren	Orange orchard
37	Geoscientific causes	The saturation of the unconsolidated colluvial cover due to antecedent heavy rains led to drastic reduction in the shear parameters of overburden material. The cutting of road across the slope consisting of loose unconsolidated material also aided to the slope instability.
38	Remedial measures	<ol style="list-style-type: none"> 1. Slope easing through the removal of loose debris material. 2. A series of berms/benches may be put in place along the cut-slope with adequate protection on the backslope of each bench. 3. Suitable and effective drainage system (lined contour drains along the benches to prevent surcharge of the unconsolidated slope forming material). 4. Suitable breast walls and retaining walls may be provided with provision of weep holes in them.

39	Remarks	Improper/unscientific slope excavation for road widening is largely accounted for the initiation of the landslide.
40	Summary/Abstract	The landslide is basically a cut-slope failure that got triggered due to heavy antecedent rainfall.
41	Date of reporting	12.07.17 [Khriellebeizo Sekhose (Geologist), P.Enos Ezung (Sr.Geologist), D.Pierü (Geologist)].



Fig-1: Laptap Landslide, PapumPare District, Arunachal Pradesh



Fig-2: Downslope view of the Laptap Landslide showing the run-out path.



Fig-3: Upslope view of the Laptap Landslide along the Trans Arunachal Highway.



Fig-4: Google Earth image of the Laptap Landslide (March 2017).