

KOTROPI LANDSLIDE, MANDI DISTRICT, HIMACHAL PRADESH

(A Preliminary report)

National Remote Sensing Centre/ISRO, Hyderabad

1. Date of occurrence: 13 August 2017

2. Background: A massive landslide occurred near the village of Kotropi, (near Kotropi Bus Stop), in Mandi District of Himachal Pradesh, on Sunday, 13th of August, 2017. The landslide occurred on National Highway 154, the road between Mandi and Pathankot (figure 1). Media reports suggest that a section of the slope collapsed totally and two buses of Himachal State Transport along with few other vehicles were buried under the debris. As of now, news reports suggest that there has been 47 fatalities from the incident. Around 300 m of the highway has been completely buried under debris, thus cutting of communication on a very important road.



Figure 1: Kotropi landslide (Source: News World India)

3. Geological Assessment: Geologically the area is in a thrust contact (Main Boundary thrust) between the Siwaliks and the Shali Group of rocks consisting mainly of dolomites, brick red shale, micaceous sandstones, purple clay and mudstones (source: GSI, 50k Geological Map). The hardness of these rocks are in general less and further they have been subjected to deformation by the thrust in the area, making them highly prone to landslides. Lineaments were mapped from the satellite image. Deep incision of the tributaries suggests that some of the lineaments could be neotectonically active since there are near to the main boundary thrust that separated Siwalik groups from lesser Himalayan rocks (Figure 2).

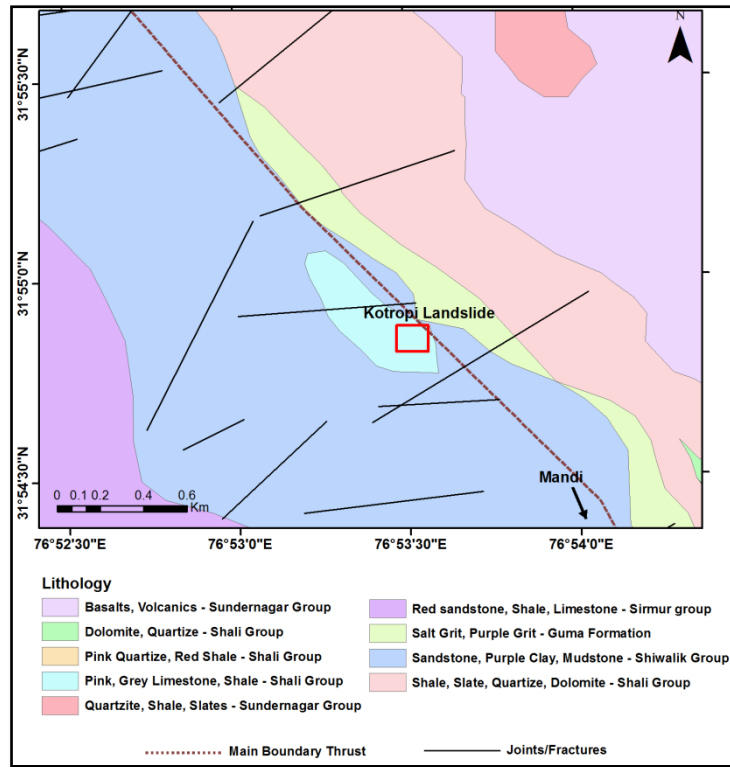


Figure 2. Simplified geological map of the region with the location of the landslide (Source: GSI)

4. Satellite-based landslide disaster assessment: Pre event LISS IV data (dated 24 march 2017) of the area shows the presence of two existing landslide scars on slope (figure 3). This indicate that the slope was unstable and was prone to a failure. Post-event satellite data over the landslide affected area were acquired by ISRO on 15 August 2017 through emergency payload programming of Resourcesat-2 satellite. Analysis of Resourcesat-2 LISS-IV FMx (5.8 m) shows the occurrence of a large landslide in the area where old landslide was observed in the pre-event satellite data. The landslide is a 'debris flow' type. It has a long runout which clearly suggest the heavy rainfall is the main cause of its occurrence. The width of the landslide is 190 m and the run out length is 1155 m.

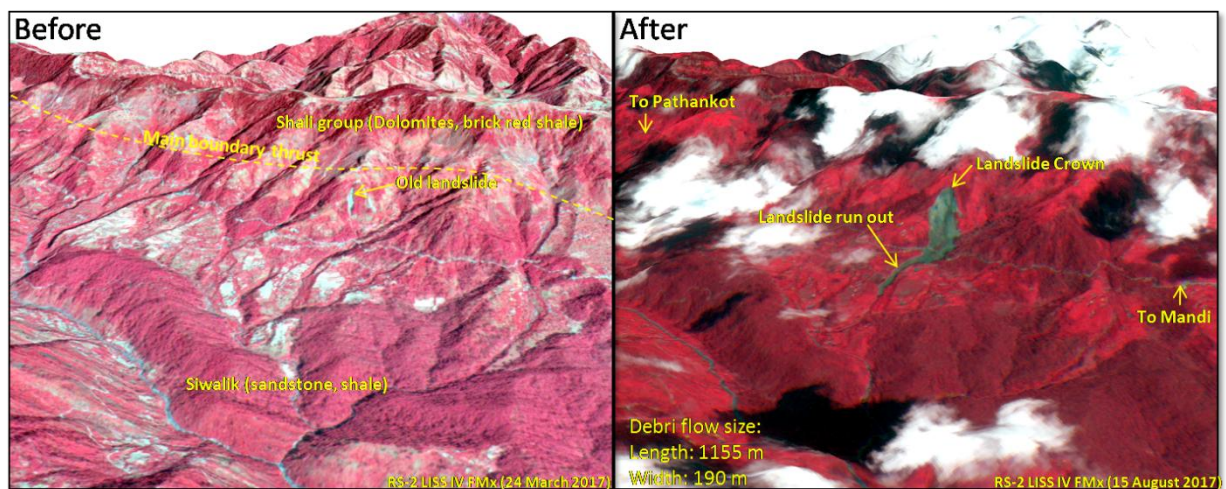


Figure 3: 3D perspective view of the Kotropi landslide. LISS-IV FMx image is draped over 10m CartoDEM

Kotropi landslide (13 Aug 2017) – A 3D perspective view (LISS IV FMx with 10 m CartoDEM)

