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13th August 2021 Chenab River Coalescent Disaster: A Geo-Informatics Based Investigation

Deepti Dwivedi[1], Arun Kumar Saraf[2], Josodhir Das[3]

[1]Research Scholar, Centre of Excellence in Disaster Mitigation and Management, IIT Roorkee
[2]Professor, Dept. of Earth Sciences, IIT Roorkee
[3]Professor, Dept. of Earthquake Engineering, IIT Roorkee

Abstract

A huge landslide blocked the flow of the Chenab River near Nalda village in Himachal Pradesh's Lahaul-Spiti district on the morning of 13th August 2021, which led to the flooding of several villages (Nalda, Jasrath, Tarang, etc.) in Udaipur subdivision. The slope on the left bank of the Chenab River failed which brought huge soil and debris blocking the Chenab River, near Leh Baring village which lies upstream of Nalda Village Bridge and opposite to Junde village creating a huge water reservoir that later started overflowing, posing a major threat to downstream villages. This caused damage to houses located downstream which were submerged, animals were also washed away, and a large part of agricultural land was also inundated. This event was observed and studied using high-resolution satellite images from Google Earth. The Spatiotemporal images from Google Earth were used to observe the scars developed from several landslides in the past along the river, which evidently show the early signatures of slope failure. To analyse the stability of the hill slope, factor of safety of the hill was evaluated using SLOPE/W GeoStudio software. Considering the vulnerability of the Chenab valley, where several hydroelectric power projects are planned on Chenab River and its tributaries, it is important to consider the effect of highly fragile terrain conditions while planning any such project. The paper also emphasizes monitoring of such vulnerable areas based on high-resolution time series satellite images which are available on regular basis to avoid the loss of human lives in the future.

Keywords: Spatio-temporal images, Factor of safety, GeoStudio