



## **Geological and geotechnical analysis of landslide along a railway cut rock slope in Eastern Ghat, India.**

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Landslide is a major concern along many transportation corridors in mountainous region across the globe. Himalayas, Western Ghat and Eastern Ghat in India is susceptible to such landslides and affects the life and livelihood of the region to a greater extent. In the present study, slope stability analysis was carried out along a railway track passing through Eastern Ghat region of India. The rock belongs to Proterozoic era and has undergone many phases of deformation and weathering. Based upon the rock mass characterization, the slope was subdivided into three different zones depending upon the degree of weathering i.e. rock mass condition. Zone-I consists of homogeneous soil mostly laterite, Zone-II consists of weathered rock surrounded by laterite and Zone-III is fresh rock. The railway corridor has been witnessing various degree of landslide in recent times. To understand the mechanism of failure, rock and slope mass characterization was carried out. Advanced numerical analysis like FEM method was also used to simulate the stability of the slope which estimated the critical failure surface and maximum shear strain accumulation that has resulted into slope failure. It was observed that the weathered Zone-I and II is the main cause of instability. The factor of safety (FoS) of the slope in saturated condition declined up to 20% as compared to dry condition. The reduction in shear strength parameters and plasticity of the lateritic soil due to infiltration of rainwater in Zone-I and II are the prime causes of the landslide in the region.

**Key words:** Landslides, Finite Element Model (FEM), Slope stability, Factor of Safety (FoS), Slope Mass Rating