

The Association of Slope Failure and Lineament Density along the Ranau-Tambunan Road, Sabah, Malaysia

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Abstract : The 54 km stretch of Ranau-Tambunan (RTM) road in Sabah is subjected to slope failures almost every year. This study is focusing on identifying section of roads that are susceptible to failure based on temporal landslide density and lineament density analyses. In addition to the analyses, the rock slopes in several sections of the road were assessed using the geological strength index (GSI) technique. The analysis involved 148 landslides that were obtained in 1978, 1994, 2009 and 2011. The landslides were digitized as points and the point density was calculated based on every 1km² of the road. The lineaments of the area was interpreted from Landsat 7 15m panchromatic band. The lineament density was later calculated based on every 1km² of the area using similar technique with the slope failure density calculation. The landslide and lineament densities were classified into three different classes that indicate the level of susceptibility (low, moderate, high). Subsequently, the two density maps were overlap to produce the final susceptibility map. The combination of both high susceptibility classes from these maps signifies the high potential of slope failure in those locations in the future. The final susceptibility map indicates that there are 22 sections of the road that are highly susceptible. Seven rock slopes were assessed along the RTM road using the GSI technique. It was found from the assessment that rock slopes along this road are highly fractured, weathered and can be classified into fair to poor categories. The poor condition of the rock slope can be attributed to the high lineament density that presence in the study area. Six of the rock slopes are located in the high susceptibility zones. A detailed investigation on the 22 high susceptibility sections of the RTM road should be conducted due to their higher susceptibility to failure, in order to prevent untoward incident to road users in the future.

Keywords : GSI, landslide, landslide density, landslide susceptibility, lineament density

Conference Title : ICEG 2016 : International Conference on Engineering Geology

Conference Location : Rome, Italy

Conference Dates : May 02-03, 2016