

## **Debris flow susceptibility analysis using a bivariate statistical Analysis in the Panataran River, Kg Melangkap, Sabah, Malaysia**

### **ABSTRACT**

This study area is part of the Kadamaian watershed and is located on the North-West flank of Mount Kinabalu, composed of sedimentary rock from the Crocker Formation and the Mt. Kinabalu granitic pluton. Many loose seismic materials were found on the slopes during the 2015 Sabah Earthquake with a moment magnitude of 6.0. These materials later served as the source material for rainfall-induced debris flows or shallow landslides. The community closest to the Panataran river in the Kg Melangkap area is the most affected. Therefore, the objective of this study is to study the debris flow susceptibility analysis using a bivariate statistical analysis approach, namely the Frequency Ratio (FR) model. Forty-eight landslides were identified using remote sensing interpretation. Characteristics of the research area, such as slope gradient, elevation, slope aspect, lithology, slope curvature, and topographic wetness index, were selected as the factors to evaluate the debris flow susceptibility analysis. The correlations between these factors and the occurrence of landslides were established, and the results were assessed and validated based on those results. Validation findings demonstrate that this technique provides high accuracy, with an AUC of 81.8 for success rate. As a result, it can be stated that this model accurately predicted landslide susceptibility in the research area, and that it can help local authority with future land-use planning, as well as give tools for hazard mitigation.