The Study on Landslide Disaster Mitigation and Management Using Numerical Analysis in Malaysia

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In Malaysia, recently, landslides happen occasionally and cause millions of losses every year. Government spends millions of Malaysian Ringgit on monitoring slope and slope failure measurement. NGO works together with local authority to monitor the slope to prevent casualty.

Setting site monitoring system in all slopes, with the extensometer, soil moisture probe, inclinometer and water gauge can monitor the movement of the soil in the slopes and predict the occurrence of slopes failure. However, installation monitoring system, in the whole country, to monitor and predict the failure of the slopes is very costly and almost impossible.

Here, we apply the numerical analysis on factor of safety F to predict the stability of the slope, which considers mechanism of resisting and driving forces in the slope. By comparing the observed data from monitoring site, history data and the result from the simulation using numerical analysis, a graph with a slope failure curve, by the rain data, can be determined. The increment of the accumulated rainfall data crossing the curve indicates the probability of the slope failure. Furthermore, the slope failure curve can also be diverted in the risk areas where have the almost same slope degree and soil properties.

Moreover, in our study, analyzing contour map, DEM data and history data by grading high, medium and low risk is proposed to determine the risk slope areas and narrow down surveying areas from the huge areas to the specified slope areas.

Data and information dissemination, by establishing quick response portal service, hazard map and providing training to the public, will alert the public on the risk of landslides. The awareness on the risk of slope failure among the public and installing the early warning system will minimize the loss due to slope failure.

Keywords: monitoring system, factor of safety, slope degree, soil properties, hazard map, public awareness