

Santi Thaiyuenwong 2010: Landslide Hazard Analysis by Geotechnical Engineering Method Considering Dynamic Factors in Andaman Coastal Area of Southern Thailand. Doctor of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Warakorn Mairaing, Ph.D. 488 pages.

Landslide is a natural disaster, causing a lot of damage on lives and properties in Thailand. Because the region under the influence of monsoon climate, that landslides are triggered by heavy rainfall on steep slope of the mountainous area. Now the problem of the landslide trend to be more serious. In this research, the landslide behavior due to dynamic factors is studied. Dynamic landslide hazard analysis and mapping are performed to predict probability of landslide that vary with rainfall. The result can be used for warning in real-time situation.

The method of landslide hazard analysis in this research is geotechnical engineering method which landslide is considered in soil mechanic behavior. Landslide hazard is analyzed by considering dynamic factors as water content and shear strength of soil. Critical degree of saturation and effective duration are two very important components. Critical degree of saturation is water content that high enough for probability of slope failure occurred. And effective duration is rainfall period that critical degree of saturation can not be occurred by initial water content only. The landslide hazard is analyzed from probability of the two components including return period of rainfall occurring.

From this research, the critical degree of saturation initiating landslide is higher than 80%. The effective present rainfall duration is 4 days. From the dynamic landslide hazard analysis, probability of landslide varies with rainfall and the different rate of infiltration into 2 concerned soil groups. In case of low rainfall intensity, landslide hazard in high permeability soil in granite rock group is lower than soil in sedimentary rock group. On the opposite for heavy rainfall intensity, the landslide hazard of soil in granite rock group will be increased rapidly in contrast with another group. This result can be used to create landslide hazard and prediction map by using GIS incorporate with script writing for GIS operating control. The predicting from rainfall can be performed by input 3 days antecedent rainfall and estimated 24 hours rainfall in the future. Landslide hazard then can be calculated and mapped over study area. Dynamic landslide hazard map is suitable for real-time prediction during the time of heavy rainfall and for continuous warning alert.

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