World Academy of Science, Engineering and Technology
International Journal of Geotechnical and Geological Engineering
Vol:10, No:02, 2016

The Comparison of Safety Factor in Dry and Rainy Condition at Coal Bearing Formation. Case Study: Lahat Area South Sumatera Province, Indonesia

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Abstract : This paper presents the role of climate change as the factor that induces landslide. Case study is located at Lahat Regency, South Sumatera Province, Indonesia. Study area has high economic value of coal reserves (mostly subbituminous – bituminous), which is developable for open pit coal mining in the future. Seams are found in Muara Enim Formation. This formation is at south Sumatera basin which is formed at Tertiary as a result of collision between the indian plate and eurasian plate. South Sumatera basin which is a basin located in back arc basin. This study aims to unravel the relationship between slope stability with different season condition in tropical climate. Undisturbed soil samples were obtained in the field along with other geological data. Laboratory works were carried out to obtain physical and mechanical properties of soils. Methodology to analyze slope stability is bishop method. Bishop methods are used to identify safety factor of slope. Result shows that slopes in rainy season conditions are more prone to landslides than in dry season. In the dry seasons with moisture content is 22.65%, safety factor is 1.28 the slope in stable condition. If rain is approaching with moisture content increasing to 97.8%, the slope began to be critical. On wet condition groundwater levels is increased, followed by γ (unit weight), c (cohesion), and φ (angle of friction) at 18.04, 5,88 kN/m2, and 28,04°, respectively, which ultimately determines the security factor FS to be 1.01 (slope in unstable conditions).

Keywords : rainfall, moisture content, slope analysis, landslide prone
Conference Title : ICSMGE 2016 : International Conference on Soil Mechanics and Geotechnical Engineering
Conference Location : Paris, France
Conference Dates : February 22-23, 2016