



Applications Of Statistical And Heuristic Methods For Landslide Susceptibility Assessment: A Case Study In Wadas Lintang Sub District, Wonosobo Regency, Central Java Province, Indonesia
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ABSTRACT UNIVERSITAS
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One of the basic activities in landslide mitigation is to generate a landslide susceptibility map which is the main objective of this research. Using appropriate method becomes the key to determine the areas prone to landslide. There are three applied methods for assessing the landslide susceptibility in Wadas Lintang sub district such as bivariate statistical analysis, multivariate statistical analysis and combination between bivariate and pair wise comparison method. The result showed that there are 71 landslide sites which are categorized into two types of landslide; rotational slides and translational slides. From the rainfall analysis, return periods of landslides can be formulated as $Y = 0.0334X - 4.0127$, where x is daily rainfall. Based on laboratory investigation, the soil textures in research area were dominated with a high percentage of clay fractions. The investigation also showed that the soil of research area can be categorized as organic clay and very plastic silt which is harmful for sliding in rainy season. The simple formulas were used to extract magnitude of landslide which is ranging from 1.848 to 2.565. Building the susceptibility map for rotational slides and translational slides should be separated because of their different characteristics. The comparison between three methods for assessing landslide susceptibility proofs that multivariate statistical analysis gives the best estimation of the location of future rotational slides as well as translational slides. The susceptible areas to landslide are determined by a combination of several factors which depend on the landslide types. Rotational slides occur on steep slopes from 15 – 30%, in areas covered by shifting cultivation and shrubs and underlain by grained sandstone, breccia and andesite. Most landslides of translational slides occur on landuse types of settlement and paddy field and in geological unit such as breccia, basalt and andesite. Translational slides dominantly occurred in flat - gentle slope from 0 to 8%. Based on the best resulted susceptibility map, the high susceptible area of rotational slides comprise 36.50% of the whole research area in which Samogede, Ngalian, Trimulyo, Lancar and Gumelar become the most susceptible villages. The high susceptible area prone to translational slides was estimated equal to 14.35% of research area at which Kaligowong, Tirip, Sumber Rejo, Wadas Lintang, and Plunjaran appear to be the most susceptible villages.

Key words: *Landslide, susceptibility, statistical, bivariate, multivariate, pair-wise.*



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