

Identifikasi kawasan rawan bencana gerakan tanah menggunakan metode analytical hierarchy process (AHP) dan frequency ratio model (FRM) di Kabupaten Bogor dan Kota Bogor Provinsi Jawa Barat = Identification of landslide susceptibility area using analytical hierarchy process (AHP) method and frequency ratio model (FRM) method in Bogor Regency and Bogor City, West Java

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Abstrak

Gerakan tanah termasuk bencana geologi yang menimbulkan kerugian besar di Kabupaten Bogor dan Kota Bogor. Untuk meminimalisasi kerugian tersebut, dilakukan prediksi kerentanan bencana gerakan tanah di wilayah tersebut. Dalam penelitian ini, prediksi divisualisasikan dalam bentuk peta kerentanan bencana gerakan tanah. Untuk menghasilkan peta prediksi, digunakan dua metode, yaitu Analytical Hierarchy Process (AHP) dan Frequency Ratio Model (FRM). Sebanyak 71 titik gerakan tanah di daerah penelitian dikumpulkan. Data tersebut bermanfaat dalam pengolahan 17 faktor yang dipertimbangkan dalam memprediksi kerentanan bencana gerakan tanah, diantaranya: kemiringan lereng, bentuk lereng, aspek lereng, topographic wetness index (TWI), stream power index (SPI), elevasi, jarak terhadap sungai, kerapatan sungai, jarak terhadap kelurusan, kerapatan kelurusan, normalized differential vegetation index (NDVI), jenis litologi, jenis tanah, curah hujan, tutupan lahan, jarak terhadap jalan, dan kerapatan bangunan. Setelah didapatkan peta potensi, risiko, dan bencana gerakan tanah di Kabupaten Bogor dan Kota Bogor, dilakukan validasi menggunakan grafik rasio frekuensi dan uji mekanika tanah. Dari hasil validasi, didapatkan peta potensi, risiko, dan bencana gerakan tanah daerah penelitian tervalidasi. Berdasarkan peta tersebut, daerah penelitian memiliki kerentanan terhadap bencana gerakan tanah semakin tinggi dari utara ke selatan. Dari kedua metode, Frequency Ratio Model (FRM) lebih cocok digunakan di daerah penelitian dibandingkan Analytical Hierarchy Process.

.....Landslide is one of the geological disasters which causes massive loss in Bogor Regency and Bogor City. To minimize such damage, landslide susceptibility prediction is proposed. In this study, landslide susceptibility prediction visualized as landslide susceptibility maps of Bogor Regency and Bogor City. To obtain that maps, two methods were applied, Analytical Hierarchy Process (AHP) and Frequency Ratio Model (FRM). At least 71 points of landslide were collected. Those data is used in 17 triggering factors processing considered in the prediction. Those are: slope angle, slope curvature, slope aspect, topographic wetness index, stream power index, elevation, distance to drainage, drainage density, distance to lineaments, lineaments density, normalized differential vegetation index, lithology types, soil types, annual rainfall intensity, land use, distance to roads, and building density. After landslide hazard, risk, and susceptibility map in Bogor Regency and Bogor City are made, the next step is to validate those maps using frequency ratio graphic and direct shear test. Based on prediction maps obtained, we can conclude that the landslide susceptibility from the north side to the south side relatively increases. We can also conclude that Frequency Ratio Model (FRM) method is way better than Analytical Hierarchy Process (AHP).