INTISARI

MIKROZONASI KERENTANAN TANAH LONGSOR BERDASARKAN METODE MIKROSEISMIK DAN ANALISA GEOMORFOLOGI DI KECAMATAN TIRTOMOYO KABUPATEN WONOGIRI

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Kecamatan Tirtomoyo, Kabupaten Wonogiri, merupakan daerah dengan struktur geografis berupa daerah pegunungan dengan tingkat kerawanan longsor yang cukup tinggi. Data statistik dari Badan Penanggulangan Bencana Daerah (BPBD) Kabupaten Wonogiri menunjukkan bahwa kurun waktu sembilan tahun terakhir telah terjadi 184 kejadian dengan upaya mitigasi yang belum maksimal. Oleh karena itu, peta zonasi tingkat kerentanan longsor diperlukan untuk langkah-langkah mitigasi bencana tanah longsor. Peta zonasi kerentanan longsor dibuat berdasarkan hasil analisa potensi tanah longsor dengan membobotkan informasi kelerengan, curah hujan tahunan, jenis tanah, data geomorfologi, data kejadian longsor terdahulu dan hasil pengolahan data mikrotremor berupa nilai *Ground Shear Strain* (GSS), kecepatan gelombang geser pada kedalaman 30 m (V_{S30}), dan ketebalan lapisan sedimen (H) pada daerah penelitian menggunakan metode *Analytic Hierarchy Process* (AHP). Sebanyak 62 titik data mikrotremor terukur pada daerah penelitian. Data mikrotremor diolah menggunakan *software* Geopsy dengan metode *Horizontal to Vertical Spectral Ratio* (HVSR) dan software OpenHVSR berbasis Matlab dengan metode inversi HVSR. Hasil penelitian menunjukkan nilai *Ground Shear Strain* antara $1.8 \times 10^{-5} - 1.5 \times 10^{-3}$, nilai V_{S30} antara 228,86 hingga 1065,64 m/s, nilai ketebalan lapisan sedimen antara 2,18 – 26,85 m. Kedelapan data tersebut menjadi dasar untuk membuat peta zonasi tingkat kerentanan longsor dengan menggunakan metode *Overlay* pada perangkat lunak Arc GIS. Hasil analisis menunjukan bahwa daerah penelitian dibagi menjadi 3 zona kerentanan longsor yaitu zona kerentanan longsor tinggi sebesar 42,39%, zona kerentanan longsor sedang sebesar 52,10%, dan zona kerentanan longsor rendah.sebesar 5,51%.

Kata kunci : Geomorfologi, Mikroseimik, *Analytical Hierarchy Process*

ABSTRACT

LANDSLIDE SUSCEPTIBILITY MICROZONATION BASED ON MICROSEISMIC METHOD AND GEOMORPHOLOGICAL ANALYSIS IN TIRTOMOYO SUB-DISTRICT, WONOGIRI DISTRICT

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Tirtomoyo Subdistrict, Wonogiri Regency, is an area with a geographical structure in the form of a mountainous areas with a high level of landslide vulnerability. Statistical data from Badan Penanggulangan Bencana Daerah (BPBD) of Wonogiri Regency shows that in the last nine years there have been 184 incidents with mitigation efforts that have not been maximised. Therefore, a landslide vulnerability zoning map is needed for landslide mitigation measures. Landslide susceptibility zoning map is made based on the results of landslide potential analysis by weighting information on slope, annual rainfall, soil type, geomorphological data, previous landslide event data and microtremor data processing results in the form of Ground Shear Strain (GSS) value, shear wave velocity at 30 m depth (Vs_{30}), and sediment layer thickness (H) in the study area using Analytic Hierarchy Process (AHP) method. A total of 62 microtremor data points were measured in the study area. Microtremor data were processed using Geopsy software with Horizontal to Vertical Spectral Ratio (HVSR) method and Matlab-based OpenHVSR software with HVSR inversion method. The results showed that the Ground Shear Strain value between $1.8 \times 10^{-5} - 1.5 \times 10^{-3}$ *Vs_{30} values between 228.86 to 1065.64 m/s, sediment layer thickness values between 2.18 - 26.85 m. The eight data were used as the basis for constructing the HVSR inversion method. These eight data became the basis to create the landslide vulnerability level zonation map using Overlay method on Arc GIS software. The analysis result shows that the study area is divided into 3 landslide vulnerability zones: high landslide vulnerability zone of 42.39%, medium landslide vulnerability zone of 52.10%, and low landslide vulnerability zone of 5.51%.*

Keywords: Geomorphology, Microseismic, Analytical Hierarchy Process