

INTISARI

Gempa bumi yang terjadi di Kabupaten Bantul, Daerah Istimewa Yogyakarta pada 27 Mei 2006 dengan magnitudo gempa bumi sebesar 6.3 mengakibatkan terjadinya kerusakan dan semburan pasir di beberapa tempat. Peristiwa alam tersebut menarik untuk dilakukan penelitian. Kejadian kerusakan gempa bumi dan likuefaksi di Kabupaten Bantul disebabkan karena wilayah didominasi oleh endapan Merapi Muda dan memiliki muka air tanah yang dangkal. Penelitian dilakukan untuk mengetahui potensi bahaya gempa bumi dan likuefaksi dengan menggunakan metode *Analytical Hierarchy Process* (AHP). Data yang digunakan dalam penelitian ini adalah peta geologi, jarak sesar, nilai kecepatan gelombang Vs30, nilai frekuensi (f_0), nilai *Peak Ground Acceleration* (PGA), kedalaman muka air tanah, jarak sungai. Metode *Analytical Hierarchy Process* (AHP) digunakan untuk mengetahui bobot dari setiap parameter yang digunakan, dengan menggunakan perangkat lunak ArcGIS. Hasil penelitian potensi bahaya gempa bumi dan likuefaksi per kecamatan di Kabupaten Bantul untuk tingkat potensi bahaya tinggi mencakup 39% mencakup dataran rendah di antara Sungai Bedog dan Sungai Opak yang tersusun oleh endapan vulkanik muda Gunung Merapi yang berumur Kuartar, dengan muka air tanah yang cukup dangkal, tingkat risiko sedang 25% dan tingkat potensi rendah 36% mencakup daerah perbukitan di bagian barat Sungai Bedog dan timur Sungai Opak tersusun oleh batuan sedimen berumur Tersier dengan muka air tanah yang dalam. Hubungan variabel dari kejadian gempa bumi dan likuefaksi menggunakan metode *Area Under the Curve* (AUC) menunjukkan nilai 0,935

Kata Kunci : Potensi Gempa bumi, Potensi Likuefaksi, AHP, Mikrotremor, Bantul

The earthquake that occurred in Bantul Regency, Special Region of Yogyakarta on May 27 2006 with an earthquake magnitude of 6.3 resulted in damage and sandblasting in several places. These natural events are interesting for research. The occurrence of earthquake damage and liquefaction in Bantul Regency was caused by the area being dominated by young Merapi deposits and having a shallow groundwater level. Research was carried out to determine the potential danger of earthquakes and liquefaction using the Analytical Hierarchy Process (AHP) method. The data used in this research are geological maps, fault distances, shear-wave velocity values V_{s30} , frequency values (f_0), Peak Ground Acceleration (PGA) values, depth of groundwater level, river distance. The Analytical Hierarchy Process (AHP) method is used to determine the weight of each parameter used, using ArcGIS software to generate a hazard map, which is classified into three levels: high, moderate, and low risk. This study analyzes the earthquake and liquefaction hazard potential in each sub-district of Bantul Regency. The results indicate that 39% of the area has a high hazard potential, primarily covering the lowland areas between the Bedog and Opak Rivers. These areas are composed of young volcanic deposits from Mount Merapi of Quaternary age, characterized by shallow groundwater levels. Meanwhile, 25% of the area is classified as having a moderate hazard potential, and 36% has a low hazard potential, mainly located in the hilly regions west of the Bedog River and east of the Opak River. These areas consist of Tertiary-aged sedimentary rocks with deep groundwater levels. The relationship between earthquake and liquefaction events, analyzed using the Area Under the Curve (AUC) method, yielded a value of 0.935, indicating a strong predictive capability.

Keywords : *Earthquake Potential, Liquefaction Potential, AHP, Microtremors, Bantul*