BEBERAPA SIFAT FISIK TANAH ALUVIAL YANG BERPOTENSI LIKUIFAKSI DI KAPANEWON JETIS, KABUPATEN BANTUL, DAERAH ISTIMEWA YOGYAKARTA

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ABSTRAK

Likuifaksi terjadi karena pelumpuran tanah sebagai efek sekunder dari gempa bumi yang dapat berdampak pada kerusakan tanah termasuk lahan pertanian. Kabupaten Bantul pernah mengalami likuifaksi sehingga berpotensi mengalami likuifaksi kembali. Penelitian ini bertujuan untuk mengetahui karakteristik beberapa sifat fisik tanah berpotensi likuifaksi dan korelasi indeks kematangan tanah (Nilai-n) dengan potensi likuifaksi. Penentuan titik sampel dilakukan menggunakan metode *purposive sampling* dengan pendekatan nilai indeks potensi likuifaksi pada penggunaan lahan tanaman tahunan sebesar 28,40 dan penggunaan lahan tanaman semusim sebesar 18,01 yang diambil pada kedalaman 0 cm hingga 300 cm. Parameter yang dianalisis meliputi ukuran butir tanah, tekstur, bahan organik, kadar lengas maksimum, daya hantar listrik (DHL), permeabilitas, potensial redoks (Eh), dan indeks plastisitas. Hasil analisis diolah untuk mengetahui hubungan indeks kematangan tanah dengan potensi likuifaksi tanah. Hasil menunjukkan karakteristik tanah yang mendukung potensi terjadinya likuifaksi, yaitu tekstur tanah yang didominasi fraksi pasir tertinggi 79,15%, kadar lengas maksimum tertinggi 88,94%, permeabilitas agak cepat, DHL tertinggi 0,416 mS/cm, serta nilai Eh yang cenderung aerob. Seluruh sampel tergolong sebagai tanah yang belum matang secara fisik berdasarkan Nilai-n, yang mengindikasi ikatan antarpartikel lemah dan mudah terdispersi saat jenuh air. Analisis regresi linier dan kuadratik antara Nilai-n dan nilai median distribusi ukuran butir tanah (D50) menunjukkan korelasi tidak signifikan dengan nilai koefisien korelasi sampel penggunaan lahan tanaman tahunan dan semusim berturut-turut sebesar −0,56 (R^2=0,3161) dan 0,38 (R^2=0,145) meskipun pola visual regresi kuadratik dengan keofisien determinan (R^2) yaitu 0,4109 dan 0,4226 yang menunjukkan kecenderungan hubungan optimum non-linier, sehingga pengaruhnya terhadap potensi likuifaksi bersifat indikatif dan memerlukan kajian lanjutan dengan mempertimbangkan variabel lain.

Kata Kunci: Indeks Kematangan Tanah, Likuifaksi, Sifat Fisik Tanah, Tanah Aluvial.

SEVERAL PHYSICAL PROPERTIES OF ALLUVIAL SOIL WITH LIQUEFACTION POTENTIAL IN KAPANEWON JETIS, BANTUL REGENCY, SPECIAL REGION OF YOGYAKARTA

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ABSTRACT

Liquefaction occurs due to soil liquefaction as a secondary effect of earthquakes, which can cause soil damage, including damage to agricultural land. Bantul Regency has previously experienced liquefaction and is therefore at risk of experiencing liquefaction again. This study aims to determine the characteristics of several physical properties of soil prone to liquefaction and the correlation between the soil maturity index (Nilai-n) *and liquefaction potential. Sample points were determined using purposive sampling with an approach based on the liquefaction potential index value for annual crop land use of 28.40 and seasonal crop land use of 18.01, taken at depths of* 0 cm *to* 300 cm*. The parameters analyzed included soil particle size, texture, organic matter content, maximum moisture content, electrical conductivity (EC), permeability, redox potential (Eh), and plasticity index. The analysis results were processed to determine the relationship between soil maturity index and soil liquefaction potential. The results showed soil characteristics supporting liquefaction potential, including soil texture dominated by the highest sand fraction (79.15%), highest maximum moisture content (88.94%), moderately fast permeability, highest electrical conductivity (0.416 mS/cm), and Eh values tending toward aerobic conditions. All samples were classified as physically immature soil based on the n-value, indicating weak interparticle bonds and easy dispersion when saturated with water. Linear and quadratic regression analysis between the N-value and the median value of the soil particle size distribution* (D50) *showed an insignificant correlation with correlation coefficients of -0.56 (R^2=0.3161) and 0.38 (R^2=0.145) for annual and perennial crop land use samples, respectively, despite the visual pattern of quadratic regression with determination coefficients (R^2) of 0.4109 and 0.4226 indicate a tendency toward an optimal nonlinear relationship, so its influence on liquefaction potential is indicative and requires further study considering other variables.*

Keywords: *Alluvial Soil, Liquefaction, Soil Maturity Index, Soil Physical Properties.*