

Microzonation of Seismic Vulnerability Index Based On Microtremor Measurement In Klaten Regency Central Java

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ABSTRACT

Research on liquefaction potential had been conducted in some parts of Klaten Regency, which are: Manisrenggo Subdistrict, Jogonalan Subdistrict and Kebonarum Subdistrict. This research is aimed to determine the microzonation of microtremor parameters, and to identify the liquefaction potential in those three subdistricts.

The research was done in 6 months from March 2021 to August 2021. This research uses geophysical method, which is microtremor method based on microtremor analysis of field measurement data from 35 measurement points with interval of 2 km for each point. The data was added by 34 secondary data which were field measurement data from previous research. The microtremor measurement was conducted for 30 minutes for each point using sampling frequency of 100 Hz. The signals then were analyzed using HVSr (*Horizontal to Vertical Spectral Ratio*) method to get the predominant frequency (f_0) value and amplification factor (A_0). From these parameters, the seismic vulnerability index and ground shear-strain (GSS) which can be used to identify the liquefaction potential in the research area were obtained.

Based on the results, Kebonarum Subdistrict has higher seismic vulnerability index which shows that the area is prone to ground deformation when an earthquake is taken place. Based on the ground shear strain (GSS) value, the subdistrict also has the potency for liquefaction to take place when there is an earthquake, whereas Manisrenggo Subdistrict and Jogonalan Subdistrict have low potency for liquefaction to take place.

Kata Kunci: *Microtremors, Vulnerability Index, Klaten Regency*