

ABSTRAK

**ANALISIS KONDISI TANAH BERDASARKAN METODE HVSR
(HORIZONTAL TO VERTICAL SPECTRAL RATIO) DAN ELLIPTICITY
CURVE DI KECAMATAN SIRIMAU, AMBON, MALUKU**

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Indonesia terletak di antara tiga lempeng tektonik yaitu Lempeng Eurasia, Lempeng Pasifik, dan Lempeng Indo-Australia yang memiliki potensi tingkat kegempaan tinggi. Salah satu gempa besar yang pernah terjadi di Indonesia yaitu gempa di Kota Ambon pada tanggal 26 September 2019 dengan magnitudo sebesar 6.6 Mw dengan kedalaman 10 km. Gempa tersebut menimbulkan adanya kerusakan yang cukup parah. Adanya kerusakan tersebut melatarbelakangi tujuan dari penelitian ini yaitu untuk menganalisis kondisi tanah yang berada di Kecamatan Sirimau, Ambon, Maluku berdasarkan metode HVSR (*Horizontal to Vertical Spectral Ratio*) dan *ellipticity curve*. Penelitian ini menggunakan data sekunder mikrotremor yang didapat dari BMKG sebanyak 25 titik pengukuran. Pengolahan data mikrotremor yang dilakukan menggunakan metode HVSR dan juga melakukan inversi HVSR menggunakan metode *ellipticity curve*. Metode HVSR merupakan metode yang digunakan untuk mengetahui karakteristik dinamika lapisan sedimen permukaan suatu daerah dengan menghasilkan amplifikasi dari perbandingan amplitudo komponen horizontal dan vertikal untuk setiap periode gelombang mikrotremor. Berdasarkan hasil penelitian, didapatkan amplifikasi dengan nilai 1.09733 m - 4.90786 m, frekuensi dominan nilai 0.4889 Hz - 13.168 Hz, Kg dengan nilai $0.2599 \text{ m}^2/\text{s} - 44.5468 \text{ m}^2/\text{s}$, PGA dengan nilai 59.1325 gal - 327.636 gal, GSS dengan nilai $6.24 \times 10^{-5} - 2.63 \times 10^{-3}$, serta Vs30 dengan nilai 181.512 m/s - 377.041 m/s yang mendominasi di Kecamatan Sirimau. Berdasarkan parameter HVSR GSS dan nilai Vs30, di Kecamatan Sirimau menunjukkan daerah yang cukup rawan terjadi deformasi saat gempa bumi yaitu pada bagian selatan dan barat daya peta, dengan klasifikasi tanah sedang dan kemampuan material untuk meregang atau bergeser tinggi.

Kata Kunci : Kondisi Tanah, Mikrotremor, HVSR, *Ellipticity Curve*, Inversi

ABSTRACT

ANALYSIS OF SOIL CONDITION BASED ON HVSR (HORIZONTAL TO VERTICAL SPECTRAL RATIO) AND ELLIPTICITY CURVE METHOD IN SIRIMAU DISTRICT, AMBON, MALUKU

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Indonesia is located between three tectonics plates they are Eurasian Plate, Pacific Plate, and Indo-Australian plate causing high seismicity. One of the largest earthquakes that ever occurred in Indonesia was the earthquake in Ambon City in September 26th, 2019 with 6.6 Mw and 10 km depth. The earthquake caused heavy damage around Maluku. The damage that caused by that earthquake is the background to the purpose of this research that is to analyze the soil conditions in Sirimau District, Ambon, Maluku based on the HVSR (Horizontal to Vertical Spectral Ratio) and ellipticity curve methods. This research uses secondary microtremor data obtained from BMKG with 25 measurement points. The data processing is carried out by using the HVSR method and also do HVSR inversion with ellipticity curve. HVSR method determines the characteristics of surface dynamics in sediment layers of the area and represents by amplification. It is calculated from ratio of horizontal and vertical component amplitude of seismogram for certain period of microtremor wave. Based on the research results, the amplification result varies from 1.09733 m to 4.90786 m, while the dominant frequency value varies between 0.4889 Hz and 13,168 Hz. Then seismic vulnerability index range from 0.2599 m²/s to 44.5468 m²/s, while PGA varies from 59.1325 gal to 327,636 gal, GSS ranges from 6.24×10^{-5} to 2.63×10^{-3} , and also Vs30 with a value from 181,512 m/s to 377,041 m/s dominated in Sirimau District. Based on several HVSR parameter like GSS and Vs30, Sirimau District shows is influenced, by deformation during earthquakes, especially in the southern and southwestern parts of the map, with moderate soil classification and high material ability to stretch or shift.

Keywords: Soil Condition, Microtremor, HVSR, Ellipticity Curve, Inversion