INTISARI

MIKROZONASI SEISMIK DENGAN MENGGUNAKAN METODE HVSR (*HORIZONTAL TO VERTICAL SPECTRAL RATIO*) DI DISTRIK JAYAPURA UTARA DAN SELATAN

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Secara umum, daerah Jayapura sering mengalami gempa bumi karena secara tektonik daerah Jayapura berada di pertemuan tiga lempeng. Ketiga lempeng tersebut yaitu Lempeng Pasifik (Lempeng Caroline), lempeng Hindia-Australia, dan lempeng Eurasia. Untuk mengurangi resiko kerusakan apabila terjadi gempa bumi dilakukan pemetaan terhadap daerah yang rawan gempa bumi dan mengetahui profil perlapisan batuan di daerah penelitian.

Metode HVSR merupakan salah satu metode untuk memperkirakan kondisi geologi bawah permukaan dan memetakan resiko terhadap gempa di daerah penelitian. Pengukuran data mikrotremor dilakukan oleh PVMBG pada 15 – 30 April 2012. Dengan metode HVSR didapatkan nilai amplifikasi dan frekuensi dominan. Dari data frekuensi dominan, dapat dihasilkan data periode dominan dan nilai Indeks Kerentanan Seismik. Data-data tersebut dipetakan untuk mengetahui daerah yang rawan terhadap gempa bumi dan dilakukan inversi pada kurva HVSR untuk mengetahui profil perlapisan batuan.

Dari pemetaan didapatkan nilai frekuensi dominan antara 1,17 – 17,27 Hz, nilai periode dominan antara 0,05 – 0,85 sekon, nilai amplifikasi antara 0,71 – 11,87, dan nilai indeks kerentanan seismik antara 0,11 – 102,8 s^2/cm. Dari hasil inversi, didapatkan nilai Vs dan diiterpretasikan bahwa ada 4 perlapisan tanah di daerah penelitian yaitu tanah lunak, tanah sedang, tanah sangat padat dan batuan lunak, dan batuan.

Kata kunci: Jayapura, mikrotremor, HVSR, inversi, amplifikasi, frekuensi dominan, periode dominan, indeks kerentanan seismik

ABSTRACT

SEISMIC MICROZONATION USING HVSR (HORIZONTAL TO VERTICAL SPECTRAL RATIO) METHOD IN NORTH AND SOUTH JAYAPURA DISTRICTS

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In general, Jayapura often experiences earthquakes because tectonically, it located above a confluence of three plates. The three plates are the Pacific Plate (Caroline Plate), the Indian-Australian plate, and the Eurasian plate. To reduce the risk of damage, mapping of earthquake-prone areas is carried out and knowing the profile of rock layers in the study area.

HVSR method is one method for estimating subsurface geological structures and mapping the risk of earthquakes in the study area. Microtremor data measurements were carried out by PVMBG on April 15-30, 2012. Using HVSR method, the amplification and dominant frequency values were obtained. From the dominant frequency data, the dominant period data and the vulnerability index values can be calculated. These data are mapped to find out areas that are prone to earthquakes and inversion is carried out on the HVSR curve to determine rock bed profile.

From the map, the dominant frequency values are between 1.17 - 17.27 Hz, the dominant period values are between 0.05 - 0.85 seconds, the amplification values are between 0.71 - 11.87, and the vulnerability index are between 0.11 – 102.8 s^2/cm. From the inversion results, the value of Vs was obtained and it is interpreted that there are 4 layers of soil in the study area, it is soft soil, medium soil, very dense soil and soft rock, and rock.

Keywords: Jayapura, microtremor, HVSR, inversion, amplification, dominant frequency, dominant period, vulnerability index