

Studi distribusi kerentanan wilayah berdasarkan data waveform noise melalui pengolahan Horizontal to Vertical Spectral Ratio (HVSr), indeks kerentanan seismik, Peak Ground Acceleration (PGA), dan Ground Shear Strain (GSS) di Cilacap, Jawa Tengah = Study of regional vulnerability distribution based on waveform noise data through horizontal to Vertical Spectral Ratio (HVSr) processing, seismic vulnerability index, Peak Ground Acceleration (PGA), and Ground Shear Strain (GSS) in Cilacap, Central Java.

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Abstrak

Berdasarkan sejarah kegempaan, Cilacap merupakan wilayah yang pernah mengalami gempa besar (>M7.0) dan gempa dahsyat (>M8.0). Penelitian bermaksud untuk mengidentifikasi daerah rentan bencana gempa menggunakan data waveform noise. Pengolahan memanfaatkan metode Horizontal to Vertical Spectral Ratio yang menghasilkan nilai amplifikasi dan nilai frekuensi dominan suatu wilayah. Berdasarkan hasil penelitian, rentang nilai amplifikasi Kabupaten Cilacap ialah 0.24 – 6.63 dan rentang nilai frekuensi dominannya ialah 0.85 – 14.08 Hz dengan wilayah Karangkadri, Karangtalun, dan Tambakreja sebagai daerah yang sangat rawan. Berdasarkan nilai frekuensinya diestimasikan bahwa daerah penelitian ditutupi oleh litologi aluvial dengan intensitas maksimum gempa yang mungkin terjadi sekitar VIII MMI. Penelitian lebih lanjut dilakukan untuk mendapatkan nilai indeks kerentanan gempa, Peak Ground Acceleration, dan Ground Shear Strain. Nilai indeks kerentanan gempa yang didapat memiliki rentang 0.038 - 6.083 s²/cm. Nilai Peak Ground Acceleration bervariasi pada rentang 3.32835 – 3.32839 gal. Sementara nilai Ground Shear Strain daerah penelitian bervariasi dalam rentang 1.578x10⁻⁸ – 1.666x10⁻⁵. Secara keseluruhan, dapat disimpulkan bahwa daerah yang sangat rawan pada Kabupaten Cilacap ialah wilayah Tambakreja yang memenuhi 5 dari 6 parameter kerawanan yang diuji.

.....Based on its seismic history, Cilacap is an area that has experienced a large earthquake (>M7.0) and a great earthquake (>M8.0). The research intends to identify earthquake-prone areas using waveform noise data. The processing is done by utilizing the Horizontal to Vertical Spectral Ratio method, producing amplification values and dominant frequency values. Based on the study results, the amplification value range of the Cilacap is 0.24 – 6.63, and the dominant frequency range is 0.85 – 14.08 Hz with Karangkadri, Karangtalun, and Tambakreja areas as the danger areas. Based on the frequency value, it is estimated that the study area is covered by aluvial lithology with a maximum intensity of earthquakes that may occur around VIII MMI. Further research was conducted to obtain the value of the earthquake susceptibility index, Peak Ground Acceleration, and Ground Shear Strain. The earthquake susceptibility index value obtained has a range of 0.038 - 6.083 s²/cm. The Peak Ground Acceleration value varies in the range of 3.32835 – 3.32839 gal. Meanwhile, the Ground Shear Strain values in the study area varied in the range of 1.578x10⁻⁸ – 1.666x10⁻⁵. Overall, it can be concluded that the earthquake-prone areas in Cilacap Regency is Tambakreja that qualified from the six parameter processing result.