

ABSTRACT

Serang City is one of the cities in Banten Province with a population growth rate of 2.59% per year. The city of Serang is in a zone that is at high risk of earthquakes because of its location in the Sunda Strait area, which is between the Indo-Australian and Eurasian Plates. The existence of active faults in Serang City is one of the causes of earthquake risk in this city. The aim of this research is to determine the vulnerability of land in the Serang City area. The Horizontal to Vertical Spectral Ratio (HVSr) method is used to evaluate earthquake risk in Serang City, Banten by knowing the seismic vulnerability index (K_g) and ground shear strain (GSS) values. The data used in this research consisted of 111 measurement points which were processed using Geopsy software to obtain natural frequency (f_0) and amplification (A_0) values through the H/V curve. The data processing includes signal analysis steps with Fast Fourier Transform (FFT), smoothing, combining horizontal components, and obtaining the average H/V. The results obtained from this research are in the form of a seismic vulnerability index to determine the vulnerability of the region which shows areas with high vulnerability ($> 20 \text{ s}^2/\text{cm}$) in Walantaka and Taktakan Districts. This area has the Banten Tufa formation. Apart from that, the ground shear strain (GSS) value which is used to determine the possibility of damage from an earthquake in Serang City ranges from 1.66×10^{-6} to 1.83×10^{-4} with the highest value in the fault line with the Banten Tufa formation and coasts with Alluvium formations.

Keywords : *HVSr, earthquake, Serang, seismic vulnerability index, ground shear strain.*