



ABSTRAK

Kabupaten Serang merupakan salah satu dari delapan kabupaten/kota di provinsi Banten, terletak di ujung barat pulau Jawa dan merupakan pintu gerbang utama yang menghubungkan pulau Sumatera dengan pulau Jawa. Luas wilayah secara administratif tercatat 1.734,28 km² dengan jumlah penduduk 11,90 juta jiwa. Secara geologis wilayah kabupaten Serang berada di zona Megathrust pertemuan lempeng tektonik Indo-Australia dan lempeng tektonik Eurasia, selain itu, Banten juga memiliki patahan-patahan aktif lainnya, seperti zona sesar Semangko, zona sesar Ujung Kulon, zona sesar Cimandiri-Pelabuhan Ratu, zona sesar Krakatau, sehingga di provinsi Banten sering dilanda gempa bumi. Mikrozonasi gempa bumi yang dilakukan di Anyer Banten dianalisis dengan metode *Horizontal to Vertical Spectral Ratio* (HVSR), bertujuan untuk membuat peta mikrozonasi faktor frekuensi dominan (f_0), amplifikasi tanah (A_0), indeks kerentanan seismik (K_g), ketebalan sedimen (h), dan regangan geser tanah (γ).

Hasil yang diperoleh menunjukkan bahwa distribusi nilai frekuensi dominan (f_0) antara 0,6 – 6,1 Hz. Distribusi nilai faktor amplifikasi tanah (A_0) antara 1,6 – 11,1. Distribusi nilai indeks kerentanan seismik (K_g) antara 1,2 – 110,7. Distribusi nilai ketebalan lapisan sedimen (h) antara 17,6 – 180 meter. Distribusi nilai regangan geser tanah (γ) antara $3,2 \times 10^{-5}$ – $3,0 \times 10^{-3}$.

Berdasarkan nilai indeks kerentanan seismik dan regangan geser tanah, wilayah kecamatan Anyer dan Cinangka di kabupaten Serang berpotensi mengalami kerusakan akibat guncangan gempa bumi serta rekahan dan penurunan tanah. Potensi kerusakan terbesar dapat terjadi di desa Sindangmandi, Cikoneng, Cikolelet, Kamasan, Sindanglaya, dan Tanjungmanis.

Kami juga menganalisis data kepadatan penduduk dengan indeks kerentanan seismik. Hasil yang didapatkan menunjukkan zona rawan kerusakan berpotensi terjadi di Kecamatan Anyer, khususnya di Desa Cikoneng, Tanjungmanis, dan Bunihara. Zona rawan kerusakan akibat gempa bumi dan pergerakan tanah sedang dapat terjadi di desa Baros Jaya, Cikolelet, Sindanglaya dan Kamasan di kecamatan Cinangka, kemudian desa Sindangmandi, Sindangkarya, Tanjungmanis, Cikoneng, Mekarsari, dan Anyer di kecamatan Anyer, serta kelurahan Gunungsugih di kota Cilegon.

Kata Kunci: *mikrozonasi, mikrotremor, HVSR*



ABSTRACT

Serang Regency is one of eight regencies/cities in the province of Banten, located at the western tip of the island of Java and is the main gateway connecting the island of Sumatra with the island of Java. The administrative area is recorded at 1,734.28 km² with a population of 11.90 million people. Geologically, the Serang district is located in the Megathrust zone, where the Indo-Australian tectonic plate meets the Eurasian tectonic plate, in addition, Banten also has other active faults, such as the Semangko fault zone, the Ujung Kulon fault zone, the Cimandiri-Pelabuhan Ratu fault zone, the Krakatoa fault, so that in Banten province is often hit by earthquakes. The microzonation of the earthquake carried out in Anyer Banten was analyzed using the Horizontal to Vertical Spectral Ratio (HVSR) method, aiming to create a microzonation map of the dominant frequency factor (f_0), soil amplification (A_0), seismic vulnerability index (K_g), sediment thickness (h), and the soil shear strain (γ).

The results obtained indicate that the distribution of the dominant frequency value (f_0) is between 0.6 – 6.1 Hz. The distribution of the value of the soil amplification factor (A_0) is between 1.6 – 11.1. The distribution of the value of the seismic vulnerability index (K_g) is between 1.2 – 110.7. The distribution of the thickness of the sediment layer (h) is between 17.6 – 180 meters. The distribution of soil shear strain value (γ) is between 3.2×10^{-5} – 2.9×10^{-3} .

Based on the values of the seismic susceptibility index and soil shear strain, the Anyer and Cinangka sub-districts in Serang district have the potential to experience damage due to earthquake shocks as well as fractures and land subsidence. The greatest potential for damage can occur in the villages of Sindangmandi, Cikoneng, Cikolelet, Kamasan, Sindanglaya, and Tanjungmanis.

We also analyzed population density data with a seismic vulnerability index. The results obtained indicate that the damage-prone zone has the potential to occur in Anyer District, sub-district can occur in Cikoneng, Tanjungmanis, and Bunihara villages. Zones prone to earthquake damage and moderate ground movement can occur in the villages of Baros Jaya, Cikolelet, Sindanglaya and Kamasan in Cinangka sub-district, then Sindangmandi, Sindangkarya, Tanjungmanis, Cikoneng, Mekarsari, and Anyar villages in Anyer sub-district, and Gunungsugih sub-district in Cilegon city.

Keywords: microzonation, microtremor, HVSR