INTISARI

Kecamatan Wates dan sekitarnya merupakan kawasan strategis yang terus berkembang sehingga memerlukan perencanaan tata ruang berbasis mitigasi bahaya seismik. Penelitian ini bertujuan untuk mengetahui sebaran potensi bahaya gempa bumi dan likuefaksi melalui integrasi informasi geologi–geomorfologi, hidrologi, dan respons dinamis tanah dari pengukuran mikrotremor metode *Horizontal to Vertical Spectral Ratio* (HVSR). Parameter yang dianalisis meliputi frekuensi dominan (f_0), amplifikasi (A_0), indeks kerentanan seismik (Kg), Vs30, percepatan tanah puncak (PGA), *ground shear strain* (GSS), jarak terhadap sesar aktif dan sungai, serta sebaran muka air tanah, kemudian seluruhnya dipetakan dan diintegrasikan menggunakan *Analytical Hierarchy Process* (AHP). Hasil menunjukkan bahaya gempa bumi bervariasi dari relatif lebih aman hingga sedang, dengan zona relatif kurang aman dominan di selatan–barat daya serta pada beberapa lokasi di bagian barat. Potensi likuefaksi berkisar rendah–tinggi, dengan konsentrasi potensi tinggi di selatan–barat daya, sedangkan area lainnya didominasi potensi rendah–sedang. Secara umum, dataran aluvial selatan–barat daya memiliki potensi bahaya seismik lebih tinggi dibanding dataran aluvial utara dan perbukitan batu gamping. Peta mikrozonasi ini menjadi dasar penetapan prioritas mitigasi, pengendalian pemanfaatan ruang, dan perencanaan pembangunan berbasis keamanan bencana seismik.

Kata kunci

Mikrozonasi; mikrotremor; HVSR; AHP; bahaya gempa bumi; likuefaksi; Vs30; Kecamatan Wates.

ABSTRACT

Wates District and its surrounding area is a strategic region that continues to develop, and therefore requires spatial planning informed by seismic-hazard mitigation. This study aims to identify the spatial distribution of earthquake hazard and liquefaction potential by integrating geological–geomorphological and hydrological information with soil dynamic response derived from microtremor measurements using the Horizontal-to-Vertical Spectral Ratio (HVSR) method. The analyzed parameters include dominant frequency (f_0), amplification (A_0), seismic vulnerability index (Kg), Vs30, peak ground acceleration (PGA), ground shear strain (GSS), distance to active faults and rivers, and groundwater-table distribution. All parameters were mapped and integrated using the Analytical Hierarchy Process (AHP). The results indicate that earthquake hazard ranges from relatively safe to moderate, with relatively less safe zones concentrated in the south–southwest and at several locations in the west. Liquefaction potential ranges from low to high, with high potential concentrated in the south–southwest, while other areas are dominated by low to moderate potential. Overall, the south–southwest alluvial plain exhibits higher seismic-hazard potential than the northern alluvial plain and the limestone hills. These microzonation maps provide a basis for prioritizing mitigation measures, regulating land use, and guiding development planning to enhance seismic-disaster safety.

Keywords
microzonation; microtremor; HVSR; AHP; seismic hazard; liquefaction potential; Vs30; Wates District