

ABSTRAK

Penilaian Risiko Terhadap Populasi dan Infrastruktur Akibat Gempa Bumi di Kapanewon Kretek, Kabupaten Bantul, Daerah Istimewa Yogyakarta

Oleh

Arta Aprilia Sri Astuti

19/445605/PA/19429

Gempa bumi D.I. Yogyakarta 27 Mei 2006 yang berpusat di 8.007° LS - 110.286° BT menyebabkan jatuhnya korban jiwa dan ribuan bangunan roboh. Penyebab gempa bumi ini diduga berasal dari Sesar Opak yang terletak di tenggara Kabupaten Bantul, Yogyakarta. Salah satu area yang terdampak adalah Kapanewon Kretek, Yogyakarta. Sehingga untuk mengurangi risiko akibat gempa bumi pada area tersebut, dilakukan penelitian dengan data mikrotremor dan data kerentanan berupa populasi dan bangunan dengan parameter fisis berupa frekuensi dominan (f_0), kecepatan gelombang geser (V_s30), percepatan getaran tanah (PGA) dan intensitas gempabumi yang digunakan untuk penilaian bahaya hingga risiko jika sesar Opak patah dan memicu gempa bumi yang besar di masa yang akan datang.

Hasil penelitian menunjukkan Kapanewon Kretek mempunyai rentang nilai f_0 1,2-5,9 Hz dan V_s30 173 m/s – 767 m/s yang mana daerah ini di dominasi oleh tanah lunak dan sedang. Selain itu, perhitungan nilai PGA menghasilkan 0,19 – 0,36 g dengan *intensity* skala VII-VIII MMI. Dimana persebaran PGA tinggi berada di Desa Tirtomulyo, Tirtosari dan Donotirto. Estimasi jumlah populasi dan bangunan terpapar sebanyak 30.800 jiwa dan 10.600 unit. Hasil penelitian ini diharapkan dapat digunakan sebagai estimasi kasar (*rough estimation*) tingkat risiko dan kerugian jika skenario terburuk gempa bumi akibat patahan Opak terjadi dan berdampak di Kapanewon Kretek.

Kata Kunci: HVSR, Inversi HVSR, V_s30 , PGA, InaSAFE

ABSTRACT

Risk Assesment on Population and Infrastructure Due to Earthquake in Kretek District, Bantul Regency, Special Region of Yogyakarta

By

Arta Aprilia Sri Astuti

19/445605/PA/19429

Earthquake that occurred on May 27th, 2006 with an epicentre of 8.007 S; - 110.286 E were of victim and damaged thousands houses. The earthquake occurred due to the activation of Opak fault which located at the southeast of Bantul Region, Province of Yogyakarta, Indonesia. One of the impacted area due to the 2006's earthquake was Kretek district, Bantul region, Yogyakarta. Therefore, to reduce the risk, research was carried out using a microtremor and assessment of element at risk of population and buildings at Kretek region, Yogyakarta with physical parameters to obtain dominant frequency (f_0), time-averaged shear-wave velocity to a depth of 30 meters (V_s30), and peak ground acceleration (PGA) and Intensity scale of MMI are used to assess the seismic hazard, vulnerability, and risk due to the activation of Opak fault in the future.

Results show that in a case of earthquake worst-case scenario, a seismic be generated with range frequency of 1.2 to 5.9 Hz and V_s30 will have a range of 173 – 767 m/s, where this area is dominated by soft and moderate soils. Moreover, the area has PGA value of 0.19 – 0.36 g, where the highest PGA is located at Tirtomulyo, Tirtosari, and Donotirto villages and the region of Kretek can be classified as seismic MMI intensity scale of VII – VIII (high). Vulnerability assessment indicates that 30.800 peoples and 10.600 buildings are exposed to high seismic hazard. This result can be used as a rough estimation if the worst-case earthquake scenario will occur at Opak fault and will impact Kretek district.

Keywords: HVSr, HVSr Inversion, V_s30 , PGA, InaSAFE