

INTISARI

PERHITUNGAN NILAI INDEKS KERENTANAN SEISMIK DAN PEMETAAN JENIS TANAH DENGAN METODE *HORIZONTAL TO VERTICAL SPECTRAL RATIO (HVSr)* DI KECAMATAN DLINGO, IMOGIRI DAN PURWOSARI, KABUPATEN BANTUL

Oleh:

Bayu Bona R Purba

18/424162/PA/18267

Salah satu catatan gempa merusak yang pernah terjadi adalah gempa 27 Mei 2006 di Yogyakarta dengan magnitudo momen 6,3. Dilihat dari segi kerugian ekonomi dalam bentuk kerusakan bangunan, gempa tersebut paling merugikan di Kabupaten Bantul. Oleh karena itu, diperlukan mitigasi bencana gempa bumi dalam bentuk perhitungan kerentanan seismik dan identifikasi jenis tanah di Kabupaten Bantul.

Mitigasi bencana kemudian dilaksanakan memanfaatkan 36 data *ambient noise* yang diolah dengan metode *Horizontal to Vertical Spectral Ratio (HVSr)* menghasilkan kurva H/V dengan daerah penelitian terletak di Kecamatan Dlingo, Imogiri dan Purwosari, Kabupaten Bantul. Kurva H/V digunakan untuk menghitung nilai indeks kerentanan seismik. Lebih lanjut, kurva H/V kemudian dimodelkan kurva eliptisitasnya kemudian diinversi dengan algoritma *Neighbourhood* menghasilkan *ground profile* kecepatan gelombang geser di permukaan. Informasi kecepatan gelombang geser dimanfaatkan untuk identifikasi jenis tanah di daerah penelitian. Informasi frekuensi dominan, faktor amplifikasi, indeks kerentanan seismik, dan jenis tanah kemudian dipetakan sebarannya dan dianalisis.

Didasari analisis yang dilakukan, diketahui nilai indeks kerentanan seismik di daerah penelitian berada pada rentang $0,07 \times 10^{-6} s^2/cm$ - $15,8 \times 10^{-6} s^2/cm$ dengan potensi daerah terdeformasi paling besar ketika diguncang gempa bumi terletak di barat sebagian desa Wukirsari, Selopamioro, Sriharjo, dan hampir seluruh desa Imogiri, Karangtalun dan Kebonagung di Kecamatan Dlingo, Kabupaten Bantul. Pada daerah penelitian diketahui jenis tanah terbagi menjadi batuan keras dan batuan. Batuan keras terletak di timur daerah penelitian dengan elevasi yang relatif jauh lebih tinggi daripada daerah penelitian di barat yang memiliki jenis tanah batuan. Daerah dengan jenis tanah batuan meliputi sebagian besar desa Wukirsari serta bagian timur desa Girirejo, Imogiri, Karangtengah, Selopamioro, dan Sriharjo.

Kata kunci: *Ambient noise*, HVSr, indeks kerentanan seismik, jenis tanah

ABSTRACT

SEISMIC VULNERABILITY INDEX CALCULATION AND SOIL TYPE MAPPING USING HORIZONTAL TO VERTICAL SPECTRAL RATIO (HVSR) METHOD IN DLINGO, IMOGIRI AND PURWOSARI DISTRICT, BANTUL REGENCY

By:

Bayu Bona R Purba

18/424162/PA/18267

One of the destructive earthquake records that has ever occurred was the 27 May 2006 earthquake in Yogyakarta with a moment magnitude of 6,3. In terms of economic losses in the form of building damage, the earthquake was the most detrimental in Bantul Regency. Therefore, earthquake disaster mitigation is needed in the form of calculation of seismic vulnerability and identification of soil types in Bantul Regency.

Earthquake mitigation was then carried out using 36 ambient noise data which was processed using the Horizontal to Vertical Spectral Ratio (HVSR) method to produce an H/V curve with the research area located in Dlingo, Imogiri and Purwosari Districts, Bantul Regency. The H/V curve is used to calculate the value of the seismic vulnerability index. Furthermore, the H/V curve was then modeled for the ellipticity curve and then inverted with the Neighbourhood algorithm to produce a ground profile of the shear wave velocity on the surface. Information on shear wave velocity is used to identify soil types in the study area. Information on dominant frequency, amplification factor, seismic susceptibility index, and soil type is then mapped and analyzed.

Based on the analysis, it is known that the seismic vulnerability index value in research area is in the range of $0,07 \times 10^{-6} s^2/cm$ - $8,03 \times 10^{-6} s^2/cm$ with an area potential of the most deformed when shaken by an earthquake are located in the western part of the villages of Wukirsari, Selopamioro, Sriharjo, and almost all villages area of Imogiri, Karangtalun and Kebonagung in Dlingo District, Bantul Regency. In the research area, it is known that the soil type is divided into hard rock and rock. Hard rock soil type is located in the east of the study area with a relatively much higher elevation than the study area in the west which has rock soil types. Areas with rock soil types cover most of the villages of Wukirsari as well as the eastern part of the villages of Girirejo, Imogiri, Karangtengah, Selopamioro, and Sriharjo.

Keywords: Ambient noise, HVSR, seismic vulnerability index, soil type