

## ABSTRACT

### **MAPPING THE DAMAGE POTENTIAL ZONES OF EARTHQUAKE IN DENPASAR MUNICIPALITY AND VICINITY USING MIKROTREMOR ANALYSIS,**

#### **CASE STUDY: SERIRIT EARTHQUAKES 14 JULY 1976**

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*The level of seismic activity in the Bali island is high where two earthquakes source area are tectonically active i.e the Back Arc Thrust in the north and the subduction zone of the Indo-Australian plate subducting into the Eurasian plate to the south. Denpasar municipality and vicinity is the administrative center of Bali province with the infrastructure diversity. This research was conducted to map the damage potential zones caused by earthquake using a single station microtremor measurement which was analyzed by using HVSR (Horizontal to Vertical Spectral Ratios) method and microtremor array were analyzed by using SPAC (Spatial Auto Correlation) method to get the value of  $v_{s30}$  (the shear waves velocity to a depth of 30m). This study uses Seririt earthquake data as a case study to find the value of PGA (Peak Ground Acceleration) on bedrock and PGA on surface soil layer. The results of HVSR analyze and PGA on bedrock in order to find the value of the seismic vulnerability index and the ground shear-strain.*

*The results shows that in Denpasar municipality and vicinity has a seismic vulnerability index values ranges from 0,103 to 33,78, ground shear-strain values ranges from  $7,00 \times 10^{-6}$  to  $2,2 \times 10^{-3}$ . Mean while,  $v_{s30}$  values ranges from 171,32 to 764,62 m/s. Based on SNI 1726:2012 and the reseach result, the classification of risk level earthquake showed that south Denpasar subdistrict has seismic vulnerability high scale (risk category I). Seismic vulnerability medium scale, i.e Kuta and west Denpasar subdistrict (risk category I, II, and III). Seismic vulnerability low areas, i.e east and north Denpasar, north Kuta, Mengwi, Sukawati, Kediri subdistrict (risk category I, II, III, and IV).*

**Keywords:** Earthquake, Denpasar, Microtremor, HVSR,  $v_{s30}$