Earthquake Hazard Microzonation Using HVSR Technique at Sembalun Tourist Area, East Lombok Regency, West Nusa Tenggara

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Abstract

Lombok earthquake 2018 has become an unforgettable natural disaster phenomenon along the year 2018 in Indonesia, especially for Lomboknese. One of totally damage area after the earthquake for a long time period enough is Sembalun Tourist Area, as an official strategic tourist area for 2017 – 2023 period that has been inaugurated by West Nusa Tenggara Local Government. As a strategic area for future economic tourism in West Nusa Tenggara, earthquake microzonation study must be done to ensure sustainable development tourism sector in Sembalun. The aim of this study is mapping earthquake microzonation based on overlaying 6 parameters, that are amplification (A), dominant period (T), *peak ground acceleration* (PGA), the distance of fault, slope, and depth of groundwater. The methods of this study using Horizontal to Vertical Seismic Ratio (HVSR), Geological Mapping and Remote Sensing, Groundwater mapping, and Analytical Hierarchy Process (AHP). Each parameter has a score depending on the scale of priority, which amplification (0.41), dominant period (0.25), PGA (0.15), the distance of fault (0.09), slope (0.05), and the depth of groundwater (0.03). The class of earthquake microzonation is divided into 5 class, that are very low risk ($3.185 < x \leq 3.923$), low risk ($2.45 < x \leq 3.185$), moderate ($1.715 < x \leq 2.45$), high risk ($0.98 < x \leq 1.715$), and very high risk (≤ 0.98). The result of the study shows that high risk and moderate zonation are concentrated at three major residential and tourist areas. They are Sembalun Bumbung, Sembalun Lawang, and Sembalun Timbagading.