

Analysis of Earthquake Potential and Shock Level Scenarios in South Sulawesi

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Abstract : In South Sulawesi Province, there is an active Walanae Fault causing this area to frequently experience earthquakes. This study aims to determine the level of seismicity of the earthquake in order to obtain the potential for earthquakes in the future. The estimation of the potential for earthquakes is then made a scenario model determine the estimated level of shocks as an effort to mitigate earthquake disasters in the region. The method used in this study is the Gutenberg Richter Method through the statistical likelihood approach. This study used earthquake data in the South Sulawesi region in 1972 - 2022. The research location is located at the coordinates of 3.5° - 5.5° South Latitude and 119.5° - 120.5° East Longitude and divided into two segments, namely the northern segment at the coordinates of 3.5° - 4.5° South Latitude and 119,5° - 120,5° East Longitude then the southern segment with coordinates of 4.5° - 5.5° South Latitude and 119,5° - 120.5° East Longitude. This study uses earthquake parameters with a magnitude > 1 and a depth < 50 km. The results of the analysis show that the potential for earthquakes in the next ten years with a magnitude of $M = 7$ in the northern segment is estimated at 98.81% with an estimated shock level of VI-VII MMI around the cities of Pare-Pare, Barru, Pinrang and Soppeng then IV - V MMI in the cities of Bulukumba, Selayar, Makassar and Gowa. In the southern segment, the potential for earthquakes in the next ten years with a magnitude of $M = 7$ is estimated at 32.89% with an estimated VI-VII MMI shock level in the cities of Bulukumba, Selayar, Makassar and Gowa, then III-IV MMI around the cities of Pare-Pare, Barru, Pinrang and Soppeng.

Keywords : Gutenberg Richter, likelihood method, seismicity, shakemap and MMI scale

Conference Title : ICGDMG 2022 : International Conference on Geoprocessing, Data Models and Geodatabase

Conference Location : Bali, Indonesia

Conference Dates : October 20-21, 2022