

Earthquake threats in Ranau – from the sources of Mensaban and Mesilou fault

ABSTRACT

Unlike the majority of Malaysia's other states, Sabah is characterised by frequent seismological activity; on average, an earthquake of moderate magnitude occurs roughly every 20 years, originating primarily from one of two major sources: either a local source or a regional source. Sabah has seen an upsurge in low to moderate seismic activity in recent years as a result of the fault activities. Between 1900 and lately, magnitudes ranging from MW 2.9 to 6.0 were recorded. While big magnitude earthquakes are relatively uncommon, the area has previously been struck by disastrous earthquakes. Fortunately, the region is demarcated by active Quaternary fault networks. As a result, the area's seismicity is calculated using line sources corresponding to these faults. Two major fault systems are suspected of being the cause of such activity: the Mensaban fault zone and the Mesilou fault zone, as well as several additional nearby faults. This article explains the process for doing a probabilistic seismic hazard analysis (PSHA) while taking into consideration the peak ground acceleration (PGA) on bedrock in the Ranau region for a 10% and 2% chance of exceedance. The PGA estimate values for Ranau are between 0.08g to 0.16g for PGA 10%, while for PGA 2% was between 0.15g to 0.28g. The PGA value is divided into the following five earthquake hazard classes based on a quarterly geostatistical analysis method. These are "very low," "low," "medium," "high," and "very high" classes. In general, this quarterly classification is a good way to see how much local seismic activity there is, based on the PGA value. Which can be seen in 10% probability, 19.88 percent of the study area was in "very low," 20.19 percent was low, 19.98 percent medium, and 19.92 percent high class. 2% probability , it was found that 19.74 percent of the total area was very low class, 20.06 percent low class, 19.79 percent middle class, and 19.82 percent high class. Only 20.6 percent of the area was "very high".