

IDENTIFICATION OF LOCAL ACTIVE FAULTS IN MAINLAND GORONTALO REGION BASED ON FOCAL MECHANISM ANALYSIS

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Abstract. *One of the nations that experiences devastating earthquakes frequently is Indonesia. Local active faults on land are one of the causes of these earthquakes. New information on the purported presence of local active faults can be obtained from the quantity of small-magnitude earthquake occurrences. By analyzing the focal sphere mechanism, small-scale earthquake data are used to identify local active faults in the Gorontalo area. The minor magnitude earthquakes ($M < 5$) that struck the Gorontalo region in February 2023 and were recorded eleven events at the BMKG- Gorontalo Geophysical Station that were used in this investigation. The resulting focus sphere diagram can be used to ascertain the faults or strike direction propensity. The focal mechanism of the earthquake in the Pohuwato region demonstrates the Oblique Thrust Fault's inclination toward a northeastern-southern strike orientation. The tendency of the strike orientation of the east-west-oriented Oblique Thrust Fault, which is the focal mechanism of the earthquake that happened in Buol, also demonstrates the same thing. According to the Gorontalo Fault diagram provided by the National Earthquake Study Center, the focal mechanism of the earthquake in Cluster A (earthquake numbers 1,6,9), the Gorontalo region, also demonstrates the strike direction of the Northwest-Southeast-oriented Oblique Thrust Fault. The earthquake occurrences in cluster B (Pohuwato area), earthquake numbers 2,3,8, and cluster C (Buol area), earthquake numbers 4, 5,7, raise the possibility of a new local active fault on the Gorontalo region's mainland. The Gorontalo region's suspicion of the existence of local active faults is strengthened by the monitoring of earthquake intensity based on occurrences that occurred between March 2023 and March 2024. Over the course of a year, there are nine to twenty-seven earthquakes with a magnitude of less than five ($M < 5$). These seismic occurrences provide credence to the theory that Pohuwato and Buol, Gorontalo, have local active faults.*

Keywords: *focal mechanism, strike, local active fault, Gorontalo mainland*