

of the 2018 Abuja Earthquakes and Probabilistic Seismic Hazard Assessment in Nigeria

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Contrary to earlier beliefs of being aseismic, Nigeria witnessed numerous earthquakes between 2018 and 2022. The 5-7 September 2018 events with moment magnitudes 2.5-3.7 and intensity II-V, occurred in Mpape, Abuja, about three kilometers from Nigeria's presidential villa and critical facilities such as dams, nuclear research reactors, etc. This study aims to adopt an integrated investigation using seismological, geophysical, geological and space-related techniques to ascertain the causes and implications of the seismic activities. Data were acquired from field surveys, local networks and international agencies. A probabilistic seismic hazard assessment was also performed throughout Nigeria and its surroundings. Findings showed the causes of recent seismicity were tectonics, as evidence of a fault was established at Mpape. The b-value, activity rate and regional possible maximum magnitude were 0.69 ± 0.07 , 1.684 ± 0.462 and 6.7 ± 0.34 . Annual activity rates of earthquake magnitudes 2.0-3.0 are high, while the likelihood of earthquakes of magnitudes 5.0-6.0 occurring annually, 50 years, 100 years, and 1000 years were 0.7%, 75.81%, 99.70%, and 100%, respectively. Return period of magnitude 6.0 earthquake is 143 years. The PGAs for a 10% chance of exceeding in 50 years range between 0.01-0.08g. Results are useful for planning and as baseline parameters for establishing seismic building codes in Nigeria.

Promotional text

CTBT's resources assist scientists to undertake scientific research and cooperation in support of national needs. For the first time, the resources were used to realize in-depth analysis of likely causes of increased seismicity in Nigeria and implications on critical facilities.

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Oral preference format

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