



Methodological Assessment of Regional Monitoring Networks in Nigeria: A Field Trial for Risk Reduction Evaluation

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Abstract

Nigeria is vulnerable to seismic events that can cause significant damage and loss of life. Regional monitoring networks are essential for early warning systems and risk reduction strategies. A systematic literature review was conducted to evaluate the design, implementation, and performance metrics of monitoring systems across different regions. The analysis included quantitative data from recent studies and expert opinions. The findings indicate that while some networks have achieved high coverage rates (over 80%), there is variability in their accuracy and reliability, particularly in remote areas with sparse population distribution. While the existing monitoring systems show promise, they require further optimization to ensure consistent performance across all regions of Nigeria. There should be a focus on enhancing data quality control mechanisms, increasing sensor density in under-monitored zones, and integrating more robust communication networks for timely alerts. The empirical specification follows $Y = \beta_{0+\beta}^{-1} p X + \text{varepsilon}$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, seismicity, monitoring, network, methodology, vulnerability, risk mitigation*

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