



# Methodological Assessment of Regional Monitoring Networks in Nigeria Using Quasi-Experimental Design for System Reliability Evaluation

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## Abstract

This scoping review examines regional monitoring networks in Nigeria to assess their reliability through a quasi-experimental design. A systematic search of literature was conducted in databases such as PubMed, Web of Science, and Google Scholar from to present. Studies were selected based on predefined inclusion criteria related to quasi-experimental designs evaluating regional monitoring networks' reliability in Nigeria. Data synthesis included thematic analysis of study findings. The analysis revealed a significant variation ( $p < 0.05$ ) in the effectiveness scores across different regions, with northern Nigeria scoring lower than southern regions. Regional monitoring networks in Nigeria exhibit varying degrees of reliability, influenced by geographical and socio-economic factors. Future research should focus on improving system performance through targeted interventions. Policy makers are advised to prioritise investment in infrastructure upgrades and training programmes for personnel operating these systems. Model estimation used  $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert} 2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** *Sub-Saharan, geographical, evaluation, methodology, reliability, network, assessment*

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