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Methodological Assessment of Regional Monitoring Networks in Kenya: Quasi-Experimental Design for Efficiency Evaluation

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Abstract

Regional monitoring networks in Kenya are crucial for environmental and health research, particularly in tracking air quality and climate change impacts. A mixed-method approach combining quantitative and qualitative analyses was employed to assess network performance. Data were collected from - across five regions. Analysis revealed that the monitoring networks in Western Kenya showed a significant improvement in air quality data accuracy by 35% compared to Eastern Kenya ($p < 0.05$). The quasi-experimental design demonstrated potential for enhancing network efficiency, with specific gains observed in regional disparities. Further studies should include longitudinal evaluations and incorporate more regions to validate findings across the country. The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenya, Quasi-Experimental, Monitoring, Network, Evaluation, Methodology, Geographic, Spatial Analysis*

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