African Applied Soil Science (Agri/Earth Science)

Methodological Evaluation of Regional Monitoring Networks in Kenya: A Cost-Effectiveness Randomized Field Trial

Oliver Kinyanjui[1], **James Ochieng**[1,2], **Winnie Mburu**[3], **Mercy Ngugi**[2]

[1] Maseno University

[2] Kenya Agricultural and Livestock Research Organization (KALRO)

[3] Kenyatta University

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Correspondence: okinyanjui@yahoo.com

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Author notes

Oliver Kinyanjui is affiliated with Maseno University and focuses on Energy research in Africa.
James Ochieng is affiliated with Maseno University and focuses on Energy research in Africa.
Winnie Mburu is affiliated with Kenyatta University and focuses on Energy research in Africa.
Mercy Ngugi is affiliated with Kenya Agricultural and Livestock Research Organization (KALRO) and focuses on Energy research in Africa.

Abstract

Regional monitoring networks in Kenya are crucial for assessing environmental impacts of energy development and ensuring sustainable practices. A stratified random sampling method was employed to select monitoring sites across diverse regions. Data collection involved both direct measurements and remote sensing techniques, with statistical analysis using generalized linear models (GLMs) for cost-effectiveness assessment. The randomized trial revealed a significant reduction of 20% in operational costs without compromising on data quality when compared to conventional methods, indicating an optimised network configuration. The study highlights the potential of regional monitoring networks as a viable and cost-effective solution for environmental assessments in Kenya's energy sector. Further research should explore scalability and long-term sustainability of these networks across different geographical and climatic conditions. Monitoring Networks, Cost-Effectiveness, Randomized Field Trial, Environmental Assessment, Energy Sector The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenyan, Geographic, Sampling, Evaluation, Sustainability, Randomization, Methodology*

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