African Soil Science Journal (Earth/Agri Science focus)

Methodological Evaluation of Regional Monitoring Networks in Kenya Using Time-Series Forecasting Models for System Reliability Assessment

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Published: 16 January 2007 | **Received:** 14 October 2006 | **Accepted:** 01 January 2007

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DOI: 10.5281/zenodo.18845144

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Abstract

This study addresses a current research gap in Energy concerning Methodological evaluation of regional monitoring networks systems in Kenya: time-series forecasting model for measuring system reliability in Kenya. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A structured analytical approach was used, integrating formal modelling with domain evidence. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Methodological evaluation of regional monitoring networks systems in Kenya: time-series forecasting model for measuring system reliability, Kenya, Africa, Energy, action research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Kenya, Geographic Information Systems (GIS), Monitoring Networks, Time-Series Analysis, Forecasting Models, Reliability Assessment, Data Analytics*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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