African Water Resources Engineering

Innovative Biomedical Engineering Solutions for Diagnostic Devices in Kenyan Resource-Limited Settings

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Abstract

This study addresses a current research gap in Engineering concerning Biomedical Engineering Innovations for Diagnostic Devices in Resource-Limited Settings in Kenya. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. 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. Biomedical Engineering Innovations for Diagnostic Devices in Resource-Limited Settings, Kenya, Africa, Engineering, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The maintenance outcome was modelled as $Y\{\}=beta0+beta1X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Kenyan, Resource-Limited, Biomedical, Innovation, Diagnostic, Technology Assessment, Telemedicine*

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