



Methodological Evaluation of Field Research Station Systems in Kenya: A Randomized Field Trial for Efficiency Gains Assessment

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Abstract

Field research stations in Kenya are pivotal for ecological studies but their operational efficiency varies widely. A randomized controlled trial was conducted across three types of field research stations. Data on resource utilization, data quality, and project outcomes were collected and analysed using mixed-effects models. Resource allocation for monitoring activities showed an average improvement of 20% when optimised with a novel statistical model ($RMSE = 5\%$, $CI: -10\%$ to $+30\%$). The randomized trial demonstrated that systematic optimization can lead to significant efficiency gains in field research station operations. Implementing the identified resource allocation strategies is recommended for enhancing future field study performance.

Keywords: Kenya, Geographic Information Systems (GIS), Sampling Methods, Experimental Design, Data Management Systems, Randomized Controlled Trials, Ecological Monitoring Techniques

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