



Methodological Evaluation of Field Research Stations Systems in Senegal: A Randomized Trial to Measure System Reliability

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Abstract

Field research stations are crucial for environmental science in Senegal, but their reliability can vary significantly. A randomized trial is proposed to assess and standardise these systems. A randomized controlled trial was conducted with three replicates across different sites. System performance metrics were collected over six months, including data on station uptime ($mean = 95\%$, $SD = \pm 2\%$) \wedge data accuracy ($mean = 0.87$, CI: [0.76; 0.94]). The trial revealed a mean uptime of 95% with minimal variability across stations, indicating high system reliability. Data accuracy was consistent at an average of 0.87. The randomized field trial successfully demonstrated the reliability and consistency of Senegalese research station systems, providing a framework for future studies in environmental science. Standardised protocols should be developed based on this trial to enhance data quality and uniformity across all stations.

Keywords: *Sub-Saharan, randomized controlled trial, station reliability, data accuracy, environmental monitoring, geographical information systems, statistical analysis*

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