Reliability Assessment of Water Treatment Facilities in Senegalese Systems Through Randomized Field Trials

Mariama Ndiaye[1,2], Sabina Sambou[3], Amadou Diop[2,3], Ibrahima Guindo[4]

[1] Institut Pasteur de Dakar

[2] Université Alioune Diop de Bambey (UADB)

[3] Council for the Development of Social Science Research in Africa (CODESRIA), Dakar

[4] Department of Sustainable Systems, African Institute for Mathematical Sciences (AIMS) Senegal

Author notes

Mariama Ndiaye is affiliated with Institut Pasteur de Dakar and focuses on Engineering research in Africa.
Sabina Sambou is affiliated with Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Engineering research in Africa.
Amadou Diop is affiliated with Council for the Development of Social Science Research in Africa (CODESRIA), Dakar and focuses on Engineering research in Africa.
Ibrahima Guindo is affiliated with Department of Sustainable Systems, African Institute for Mathematical Sciences (AIMS) Senegal and focuses on Engineering research in Africa.

Abstract

Water treatment facilities in Senegalese systems have been implemented to ensure safe drinking water supply. However, their reliability under real-world conditions is not well understood. Randomized field trials were conducted in Senegal between to evaluate the performance of water treatment systems. The study employed a mixed-method approach combining quantitative data on system outputs with qualitative insights from user feedback. The analysis revealed that 78% of facilities functioned reliably, but there was variability in performance across different regions and types of treatment. While the primary goal of water treatment systems is achieved, further optimization is needed to enhance reliability consistently across all facilities. Investment should be prioritised in maintenance and upgrading of less reliable facilities to ensure consistent service quality. Water Treatment Facilities, Senegal, Reliability Assessment, Randomized Field Trials The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, randomized controlled trial, waterborne diseases, treatment efficacy, system resilience, contamination resistance, epidemiological surveillance*

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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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