Replication Evaluation of Municipal Water Systems in Ethiopia: A Field Trial Approach

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Abstract

Ethiopia faces challenges in ensuring safe drinking water for its population, with municipal water systems playing a critical role in addressing these issues. A randomized controlled trial was conducted in three randomly selected municipalities within Ethiopia. Water samples were collected at various points throughout the distribution network, analysed for contaminants using validated analytical methods, and compared against established standards. Significantly higher levels of contamination ($p < 0.05$) were detected in water samples from municipal systems not meeting regulatory thresholds, indicating potential health risks if used without treatment. The findings underscore the importance of regular monitoring and stringent adherence to safety standards for municipal water supplies in Ethiopia. Municipalities should implement robust water quality management practices and regularly test their water sources to ensure compliance with national and international guidelines. Model estimation used $\hat{\theta} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Ethiopia, Geographic Information Systems (GIS), Randomized Controlled Trials (RCTs), Water Quality Assessment, Data Analysis Techniques, Spatial Statistics, Remote Sensing*

ABSTRACT-ONLY PUBLICATION

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