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Methodological Assessment of Quasi-Experimental Designs in Municipal Water Systems Yield Improvement in Nigeria: An African Perspective

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Abstract

Municipal water systems in Nigeria face challenges related to yield improvement, necessitating robust methodological evaluations. A systematic literature review approach was employed, including databases such as PubMed and Web of Science, with inclusion criteria based on specific keywords and study design types. Quasi-experimental designs predominantly focused on randomized controlled trials (RCTs) and difference-in-differences (DiD), though there were variations in implementation methods and outcomes. The review identified a growing interest among researchers but noted inconsistencies in data collection and analysis techniques, highlighting the need for standardization. Standardised guidelines for quasi-experimental designs should be developed to enhance comparability and reliability of yield improvement studies in municipal water systems. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, quasi-experimental design, agricultural water management, yield assessment, impact evaluation, statistical analysis, rural development methodologies*