

# Review of: "Assessment of Quality, Bacterial Population and Diversity of Irrigation Water in Selected Areas of Minna, Niger State, Nigeria"

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Potential competing interests: No potential competing interests to declare.

1. **Comprehensive Study Design:** The study's design, encompassing multiple locations and replicates, provides a robust framework for assessing irrigation water quality in Minna, Niger state. This approach enhances the reliability and generalizability of the findings.
2. **Insightful Findings:** The research sheds light on the significant influence of location on the quality and bacterial composition of irrigation water. Such insights are crucial for understanding the dynamics of water resources in agricultural settings and can inform targeted interventions for improving water management practices.
3. **Bacterial Diversity Analysis:** The examination of bacterial populations and diversity adds depth to the assessment of water quality, highlighting variations across different locations. This aspect of the study contributes valuable information for assessing the microbial risks associated with irrigation practices and underscores the importance of monitoring microbial contaminants.
4. **Practical Implications:** The identification of Fadikpe as having the highest bacterial population and the least diversity underscores the need for targeted interventions to mitigate microbial contamination in irrigation water sources. Such insights can guide policymakers and stakeholders in implementing measures to safeguard public health and optimize agricultural productivity.
5. **Quality Assessment and Recommendations:** The comparison of physicochemical properties against standard benchmarks, particularly the findings regarding Chanchaga water's suitability for irrigation despite certain parameters exceeding recommended values, prompts further examination of water quality criteria and management strategies. The recommendation for additional studies to explore the potential of bioremediation approaches offers a proactive pathway for addressing water quality challenges.
6. **Future Research Directions:** The call for further investigations into the biodegradation potential of specific microbial species, such as *B. subtilis* and *Escherichia coli*, highlights avenues for advancing knowledge in bioremediation strategies tailored to local water quality conditions. This forward-looking approach underscores the importance of ongoing research efforts to address emerging challenges and optimize agricultural sustainability in Minna and similar regions.

