



Internet of Things for Smart Water Management in Rural Senegalese Communities: Evaluating Water Loss Reduction Six Months Post-Launch in Mauritius

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Abstract

The Internet of Things (IoT) has emerged as a promising technology for enhancing smart water management in rural communities, particularly through IoT-enabled devices that monitor and control water usage more efficiently. A mixed-methods approach was employed, including pre- and post-launch surveys, data from IoT devices, and qualitative interviews with community members and local authorities. Initial data analysis indicated an average reduction in water loss by 15% within the first six months of deployment, with some households reporting significant savings in their monthly water bills. The findings suggest that the IoT system is effective in reducing water loss, but further research is needed to understand its long-term viability and impact on community engagement. Communities should be actively involved in the design and implementation of IoT systems for smart water management. Additionally, ongoing support and maintenance are necessary to ensure sustained benefits. Internet of Things, Smart Water Management, Senegal, Mauritius, Water Loss Reduction Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: *Internet of Things, Smart Water Management, Rural Communities, Sensor Networks, Data Analytics, Precision Irrigation, Community Engagement*

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