



# IoT-Enabled Community Response Systems in Kenyan Coastal Towns: An Evaluation

Ombwoyo Ochieng<sup>1</sup>, Mugo Muthoni<sup>1,2</sup>, Kamau Kamau<sup>2,3</sup>, Cheruyio Okello<sup>4</sup>

<sup>1</sup> Kenya Medical Research Institute (KEMRI)

<sup>2</sup> Department of Cybersecurity, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

<sup>3</sup> Department of Data Science, Kenya Medical Research Institute (KEMRI)

<sup>4</sup> Department of Software Engineering, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi

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**Correspondence:** [oochieng@yahoo.com](mailto:oochieng@yahoo.com)

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## Author notes

*Ombwoyo Ochieng is affiliated with Kenya Medical Research Institute (KEMRI) and focuses on Computer Science research in Africa.*

*Mugo Muthoni is affiliated with Kenya Medical Research Institute (KEMRI) and focuses on Computer Science research in Africa.*

*Kamau Kamau is affiliated with Department of Cybersecurity, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Computer Science research in Africa.*

*Cheruyio Okello is affiliated with Department of Software Engineering, International Centre of Insect Physiology and Ecology (ICIPE), Nairobi and focuses on Computer Science research in Africa.*

## Abstract

IoT-enabled community response systems are increasingly being implemented to enhance disaster preparedness and response in urban areas worldwide. A mixed-methods approach was employed, including pre- and post-intervention surveys, focus group discussions, and technical assessments of IoT devices deployed across six communities. Among the participants who used the system (35%), there was a significant improvement in response times to emergencies, with an average reduction of 20% compared to baseline periods. Technical reliability of the IoT devices was robust but showed occasional glitches requiring maintenance. The findings suggest that IoT systems can significantly enhance community resilience during disasters when integrated into existing emergency management frameworks. Communities and policymakers should invest in regular training for users, continuous device upgrades to prevent failures, and long-term monitoring of system performance to optimise outcomes. IoT, community response, disaster preparedness, Kenyan coastal towns Model estimation used  $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda \operatorname{Vert}\theta \operatorname{rVert} 2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** African Geography, IoT, Wireless Sensor Networks, Networked Embedded Systems, Data Analytics, Smart Cities, Community Mobilization

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