

Catalytic Tech-Based Participatory Methods To Build Climate Resilience Locally:

A Case Study Of Mathare Informal
Settlement, Nairobi, Kenya

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EXECUTIVE SUMMARY

This study examined how technology-enabled participatory methods can strengthen climate resilience in Mathare, one of Nairobi's most vulnerable informal settlements. These communities face severe climate risks, particularly flooding, yet residents are often excluded from decision-making processes that affect their lives. The research evaluated the effectiveness of participatory low-tech digital platforms in capturing local knowledge, examined barriers to inclusive participation, and developed practical recommendations for integrating community-generated data into urban resilience planning.

The findings revealed that community knowledge is both dependable and essential. Resident-led flood mapping demonstrated over 80% correlation with official topographical data, validating local expertise and challenging assumptions that informal settlement residents lack reliable information. The MWAMKO digital platform achieved robust engagement and usage by the locals, demonstrating the potential of technology to amplify and strengthen community voices. However, significant challenges emerged amongst them digital literacy gaps, connectivity issues affecting 31% of sessions, and concerns about data privacy emanating from the residents during fieldwork. While community groups and local organizations played a key role in facilitating participation, critical governance gaps persisted as neither county nor national government actors engaged meaningfully in the process. Structural barriers such as insecure tenure and forced evictions continued to undermine resilience efforts, yet co-design and co-production processes helped build trust, ownership, and empowerment among residents putting them at the forefront of this research process.

Based on the findings, the study recommends the integration of community generated data into formal planning processes and addressing of structural barriers through clear policies on land tenure, eviction protection, and participatory governance frameworks. It also urges development partners to invest in hybrid approaches combining digital and low-tech methods such as SMS and USSD to ensure equitable participation across demographic groups. Long-term capacity building rather than short-term pilot projects is essential, alongside funding for community-controlled infrastructure including technology centers and subsidized connectivity. The study further argues that community organizations should manage platforms locally to ensure sustainability and data sovereignty while advocating for data rights and transparent governance mechanisms. Anchoring resilience strategies in existing grassroots structures will maintain legitimacy and reach. Finally, it recommends that future research include longitudinal studies tracking sustained technology adoption and its impact, as well as comparative research across diverse informal settlements. This would be useful in identifying universally applicable principles and necessary contextual adaptations.