Towards Developing a Toolkit for Community-Driven Climate Adaptation:

A Realist and Implementation Science Analysis of Urban Informal Settlements in Nairobi, Kenya

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Executive Summary

The convergence of rapid urbanization and climate change poses a compounding threat to the one billion people living in urban informal settlements worldwide. In Nairobi, Kenya, where 60% of the urban poor reside in such settlements, communities are not passive victims but active innovators, developing their own solutions, or Community-Driven Climate Adaptations (CCA), to hazards like flooding. However, the reasons why some of these initiatives succeed while others falter remain poorly understood, limiting our ability to support and scale effective practices.

This study addresses this gap by moving beyond simple descriptions of interventions to explain *how and why* CCA work in specific contexts. Conducted in the informal settlements of Mathare and Mukuru in Nairobi, this research employed a novel approach combining Realist Evaluation with established Implementation Science frameworks (CFIR, ERIC, RE-AIM). Our primary objective was to identify the underlying causal mechanisms (M) and contextual factors (C) that determine the success of CCA.

This "bottom-up" inquiry aligns directly with national environmental priorities. As confirmed by key informants at the National Environment Management Authority (NEMA), there is a formal recognition that the complex, linked challenges of river health, urban pollution, and climate change cannot be solved by top-down policy alone. National-level experts confirm that harnessing "local knowledge" from communities, who have their "own unique ways" of adapting, is critical for developing effective, scalable programs. This study, therefore, provides the critical evidence base for how such integration can be achieved."

Key Findings: Through a comparative case study analysis, we developed Context-Strategy-Mechanism-Outcome (C-S-M-O) configurations. These are causal maps that explain the pathways to success. Our findings reveal two core causal pillars that determine an intervention's viability:

1. Economic & Survival Primacy: The success of any CCA is contingent on its relationship to the community's foundational economic and survival needs. We found a critical divergence:
    - In Mukuru, a context of relative stability, a "Primacy of Payment" mechanism was a powerful *facilitator*. Reliable, paid work (e.g., Climate WorX) was a viable economic competitor to crime.
    - In Mathare, a context of acute health crisis (cholera, "sewage in the house"), a "Primacy of Need" mechanism acted as a profound *barrier*, making any project not addressing immediate survival (e.g., "flour") non-viable.
2. The Mechanisms of Agency: Community agency is not a given but a fragile mechanism that must be actively constructed.

- In Mukuru, agency was *activated* by a dual mechanism of "Formal Legitimization" (via the Special Planning Area, or SPA) and "Trusted, Non-Sectarian Leadership" (a CCA innovator/local leader/CBO/Chief anchor).
- In Mathare, agency was "Paralyzed" by a dual negative mechanism of "Formal Hostility" (the "Whose Letter?" paralysis) and "Informal Suspicion" (the "Whose Agent?" perception).

These causal insights informed the co-design of a practical toolkit translating mechanisms into operational steps.

Practical Application and Recommendations: The primary output is a dual-prototype implementation toolkit (v1.0). This suite translates our causal findings into two evidence-based formats (see Toolkit 1a and 1b): (1a) a "high-level" Intermediary Toolkit for planners, CBOs, and NGOs, and (1b) a "draft translation" Community Action Guide for grassroots innovators. This dual approach is intentional, serving as the foundation for a future roadmap of stakeholder co-refinement and validation. This study provides a clear, evidence-based pathway for supporting, financing, and scaling effective, community-driven climate adaptation.