African Restoration Ecology (Environmental Science)

Climate-Resilient Infrastructure Design for Flood Management in Mozambique: A Case Study Approach

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Abstract

Floods in Mozambique pose significant threats to infrastructure and human settlements, necessitating resilient design strategies that can mitigate climate-related risks. A mixed-methods approach combining field surveys, remote sensing analysis, and expert interviews was employed to assess current flood risk levels and identify potential design solutions. A probabilistic model predicting future flood scenarios under climate change conditions informed the design parameters. An analysis of historical rainfall patterns revealed a clear trend towards increased intensity and frequency of floods over the past decade, necessitating proactive adaptation measures. The study concludes that incorporating adaptive infrastructure designs into existing structures can significantly enhance their resilience to climate-induced flood events in Mozambique. Local authorities are recommended to implement the proposed design guidelines for future construction projects and integrate these strategies as part of ongoing flood risk management efforts. Climate change, Flood management, Resilient infrastructure, Mozambique The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Floodplain, Adaptation Studies, Geospatial Analysis, Climate Change Vulnerability Mapping, Resilience Metrics, Infrastructure Retrofitting, Hydrological Modelling*

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