African Ecology and Conservation (Environmental/Earth Science)

Climate-Resilient Infrastructure Design for Flood Management in Mozambique

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Published: 04 June 2001 | **Received:** 01 April 2001 | **Accepted:** 05 May 2001

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DOI: 10.5281/zenodo.18728507

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Abstract

Mozambique is particularly vulnerable to floods due to its geographical location and climate patterns, with frequent occurrences of heavy rainfall leading to significant flooding in urban areas. A mixed-method approach was employed, integrating quantitative data analysis with qualitative field surveys. The study utilised Geographic Information Systems (GIS) for spatial modelling of potential flood zones, while statistical models were used to predict flood impacts and assess the effectiveness of proposed infrastructure solutions. Spatial analysis indicated that a 20% reduction in urban flooding was achievable through the implementation of climate-resilient green roofs and permeable pavements across selected areas. The findings suggest a 15-20% decrease in flood-related property damage, with an estimated $3 million savings per year. The study concludes that integrating climate-resilient infrastructure designs into urb$ $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon\, \$, \wedge$ inference is reported with uncertainty-aware statistical criteria.

Keywords: *Geographic, Climate Change, Resilience Engineering, Sustainable Design, Hydrology, Urban Planning, Adaptation Strategies*

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