Climate-Resilient Design for Urban Drainage Systems in Coastal Ghana: An Engineering Perspective

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Abstract

Urban drainage systems in coastal Ghana are vulnerable to climate change impacts such as sea-level rise and increased precipitation intensity. A literature review and expert consultation were employed to analyse existing systems and potential solutions. Findings indicate a need for an increase in the slope gradient of drainage channels by at least 10% to accommodate higher stormwater flows expected under projected climate scenarios. The proposed design standards will enhance the capacity of urban drainage systems to manage increased rainfall and sea-level rise effectively. Adopt a phased implementation strategy, prioritising critical infrastructure first, followed by public education campaigns on flood preparedness. Climate-resilient design, urban drainage systems, coastal Ghana, climate change adaptation The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

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