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

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Abstract

Urban drainage systems in coastal areas of Ghana are vulnerable to climate change impacts such as increased rainfall intensity and sea-level rise. A combination of hydrological models and structural engineering analysis was employed to simulate system performance in various climate scenarios. The model predicted a 20% increase in peak discharge during heavy rainfall events, necessitating enhanced drainage infrastructure design. The findings highlight the critical need for adaptive management strategies that incorporate green infrastructures and robust drainage systems. Urban planners should integrate climate resilience into urban planning policies to ensure sustainable development in coastal areas. climate-resilient, urban drainage, hydrological modelling, structural engineering The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords:

Geographic Terms: *Coastal,*

Methodological Terms: *Hydrology, Modelling*

Theoretical Terms: *Climate-Change Adaptation, Resilience Engineering*

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