



Structural Integrity Assessment of Aging Infrastructure in Uganda

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Abstract

The structural integrity of aging infrastructure in Uganda is a critical issue affecting safety and functionality. A mixed-method approach combining field inspections with Finite Element Analysis (FEA) simulations to evaluate stress distribution in structures. Stress concentrations were identified at joints and connections, indicating the need for reinforcement or repair. The structural integrity of selected infrastructure components is compromised, necessitating targeted maintenance programmes. Immediate inspection and planned maintenance schedules should be implemented to address identified issues. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geography, Finite Element Analysis (FEA), structural fatigue, asset management, deterioration modelling, seismic resistance, sustainability assessment*

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