



Structural Integrity Assessment of Aging Infrastructure in Uganda

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Abstract

Uganda's aging infrastructure, particularly bridges and buildings, poses significant structural integrity risks. A combination of field inspections and finite element analysis (FEA) was employed to evaluate the structural health of selected infrastructure components. Inspection data revealed a clear trend of increasing crack formation with age, indicating deterioration over time. While FEA provided detailed insights into stress distribution and potential failure points, empirical evidence showed variable compliance across different structures. Uganda should prioritise regular inspections and proactive maintenance for its aging infrastructure to mitigate future risks. structural integrity, finite element analysis, age-related deterioration, Uganda The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \varepsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African geology, Finite element analysis, Structural health monitoring, Material fatigue, Durability studies, Load testing, Non-destructive evaluation*

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