African Civil Procedure

Structural Integrity Assessment of Aging Infrastructure in Uganda

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Abstract

Uganda faces significant structural integrity challenges in its aging infrastructure, particularly bridges and buildings. These structures are critical for economic development and public safety. Structural assessments were conducted using finite element analysis (FEA) software. Data collection involved surveys, field measurements, and expert evaluations. Concrete strength in selected structures varied between 30% and 70% of the nominal value, indicating potential risks with current structural integrity standards. The study highlights substantial discrepancies in concrete quality across different regions, posing significant safety concerns for public and economic infrastructure. Immediate reinforcement measures are recommended for structures below 50% strength to prevent failures. Standardization of assessment protocols is also suggested. Structural Integrity, Aging Infrastructure, Finite Element Analysis (FEA), Concrete Strength The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, AgingStructures, SustainableDesign, CohesiveZoning, Non-DestructiveTesting, MaterialDegradation, FiniteElementAnalysis*