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Structural Integrity Assessment of Aging Infrastructure in Uganda (Bridges and Buildings)

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Abstract

Infrastructure in Uganda, particularly bridges and buildings built between and , is facing significant structural integrity challenges due to age-related deterioration. A mixed-method approach was employed, combining field inspections using visual assessment tools and non-destructive testing (NDT) techniques. Data collected included structural dimensions, material composition, and environmental conditions. Structural integrity assessments revealed that approximately 40% of the buildings and 25% of bridges were below acceptable safety standards, with specific concerns noted in areas exposed to high-traffic loads or subjected to severe weather events. The findings highlight a critical need for targeted intervention strategies to mitigate risks associated with aging infrastructure, particularly focusing on identified vulnerable components. Immediate structural inspections should be conducted on the most compromised structures. A phased rehabilitation plan is recommended, prioritising buildings and bridges in high-risk areas. Infrastructure Assessment, Structural Integrity, Aging Infrastructure, Uganda The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African, Structural Health Monitoring, Non-Destructive Testing, Fatigue Crack Detection, Life Cycle Analysis, Degradation Modelling, Condition Assessment*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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