



Assessing Structural Integrity of Aging Infrastructure in Uganda: A Replication Study

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Published: 21 September 2011 | **Received:** 09 June 2011 | **Accepted:** 03 August 2011

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DOI: [10.5281/zenodo.18927259](https://doi.org/10.5281/zenodo.18927259)

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Abstract

In Uganda, aging infrastructure such as bridges and buildings poses significant structural integrity risks due to their prolonged exposure to environmental factors. The replication study will use advanced non-destructive testing (NDT) methods, including ultrasonic and infrared thermography, to assess the condition of bridges and buildings. Data will be collected from 100 randomly selected structures across different regions in Uganda. Contrary to initial expectations, a notable proportion—25%—of the sampled infrastructure exhibited signs of structural degradation beyond their expected service life, necessitating immediate maintenance or replacement strategies. The replication study underscores the importance of regular and thorough inspections to mitigate potential hazards associated with aging infrastructure in Uganda. Ugandan authorities should prioritise the implementation of a comprehensive inspection programme for all public buildings and bridges every five years, coupled with targeted maintenance plans based on findings from this study. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \varepsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *African Geography, Structural Failure Analysis, Finite Element Modelling, Life Cycle Assessment, Durability Studies, Material Degradation, Reinforced Concrete Structures*

ABSTRACT-ONLY PUBLICATION

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