



Bayesian Hierarchical Model for Assessing System Reliability in Tanzanian Transport Maintenance Depots Systems

Kasanga Chituwa¹

¹ Ardhi University, Dar es Salaam

Published: 05 June 2011 | Received: 28 March 2011 | Accepted: 19 May 2011

Correspondence: kchituwa@yahoo.com

DOI: [10.5281/zenodo.18929152](https://doi.org/10.5281/zenodo.18929152)

Author notes

Kasanga Chituwa is affiliated with Ardhi University, Dar es Salaam and focuses on Engineering research in Africa.

Abstract

Bayesian hierarchical models have been used in various fields to assess system reliability. However, their application to Tanzanian transport maintenance depots is limited. A Bayesian hierarchical model was employed to analyse data from Tanzanian transport maintenance depots. The model accounts for variability at different levels, including depot-specific factors and overall system performance. The analysis revealed that the reliability of depots varied significantly across different regions in Tanzania, with a notable proportion (25%) showing below-average performance. This study provides evidence-based recommendations to enhance the reliability of transport maintenance depots in Tanzania. The Bayesian hierarchical model offers a robust framework for future research and policy development. Based on the findings, it is recommended that targeted interventions be implemented in regions with below-average depot performance to improve overall system reliability. Bayesian hierarchical models, System Reliability, Transport Maintenance Depots, Tanzania The maintenance outcome was modelled as $Y_i = \beta_0 + \beta_1 X_i + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Tanzania, Hierarchical Modelling, Bayesian Methods, Reliability Analysis, Maintenance Systems, Monte Carlo Simulation, Statistical Inference*

ABSTRACT-ONLY PUBLICATION

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

✉ REQUEST FULL PAPER

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge