



# Bayesian Hierarchical Model for Evaluating Transport Maintenance Depot Systems in Senegal, 2007

Mamadou Ndiaye<sup>1,2</sup>, Abdoulaye Diop<sup>1,2</sup>

<sup>1</sup> Institut Sénégalais de Recherches Agricoles (ISRA)

<sup>2</sup> African Institute for Mathematical Sciences (AIMS) Senegal

**Published:** 02 December 2007 | **Received:** 30 June 2007 | **Accepted:** 06 October 2007

**Correspondence:** [mndiaye@yahoo.com](mailto:mndiaye@yahoo.com)

**DOI:** [10.5281/zenodo.18859778](https://doi.org/10.5281/zenodo.18859778)

## Author notes

*Mamadou Ndiaye is affiliated with Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Engineering research in Africa.*

*Abdoulaye Diop is affiliated with Institut Sénégalais de Recherches Agricoles (ISRA) and focuses on Engineering research in Africa.*

## Abstract

This study aims to evaluate transport maintenance depots in Senegal, focusing on their efficiency and potential for improvement. A Bayesian hierarchical model will be used to analyse data from multiple depots, incorporating spatial and temporal variability to estimate yield improvements with uncertainty quantification. The analysis revealed significant variation in maintenance efficiency across different depots, indicating the need for targeted interventions. The application of a Bayesian hierarchical model offers a robust framework for evaluating transport maintenance systems, enhancing their operational performance. Deploying tailored improvement strategies based on regional and depot-specific data could lead to substantial yield improvements in Senegalese depots. The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + \text{varepsilon}$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *African geography, Bayesian statistics, Hierarchical modelling, Methodological evaluation, Quantile regression, Spatial analysis, Transportation systems*

## 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](mailto: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](http://app.parj.africa)



Scan to visit [app.parj.africa](http://app.parj.africa)

**Open Access Scholarship from PARJ**

Empowering African Research | Advancing Global Knowledge