REVIEWER 3 REPORT

African Journal of Community and Environmental Health

Urban Road Drainage Failure Analysis and Rehabilitation Planning in Juba City, South Sudan: Integrating Hydrological Modelling, Failure Mode Diagnostics, and Cost-Benefit Optimisation

Structured peer-review report for editorial verification

Reviewer	Reviewer 3
Recommendation	Major Revision
Journal	African Journal of Community and Environmental Health
Date	27 Mar 2026

Overall Summary

This study addresses a critical urban infrastructure problem in Juba City with a comprehensive methodological approach. The integration of field surveys, hydrological modelling, and cost-benefit analysis is commendable. However, significant methodological limitations and incomplete reporting undermine the validity of findings. The manuscript requires substantial revision to address fundamental issues with data quality, model assumptions, and analytical transparency before it can be considered for publication.

Major Issues

- The Rational Method application lacks justification for its suitability in Juba's complex urban environment, with no discussion of limitations or validation against observed flood events.
- The 42-year rainfall record from a single airport station may not represent spatial variability across Juba's 28 sub-catchments, potentially biasing IDF curves and subsequent capacity calculations.
- The cost-benefit analysis appears incomplete in the provided text, lacking details on cost estimation methods, benefit quantification, discount rates, and sensitivity analysis for key assumptions.

Minor Issues

- The abstract exceeds typical length limits and contains technical details better placed in methodology sections.
- The manuscript uses both British and American English spellings inconsistently (e.g., 'optimisation' vs 'calibrated').
- The affiliation listing with multiple institutions requires clarification regarding primary institutional support and ethical approval.

Questions for the Authors

- What quality control measures were implemented during the field survey to ensure consistent documentation of 1,166 failure events across 26.4 km of drainage infrastructure?
- How were the 28 sub-catchments delineated, and what digital elevation model or topographic data supported this hydrological analysis?
- What specific green infrastructure components are included in Scenario D, and how were their hydrological performance and maintenance costs estimated?

Required Changes

- Substantially revise the methodology section to justify model selections, document data limitations, and validate hydrological outputs against independent observations.
- Complete and transparently report the cost-benefit analysis methodology, including all assumptions, parameter values, and sensitivity testing.
- Provide explicit discussion of study limitations regarding data quality, model simplifications, and generalisability of findings.
- Standardise language to British English conventions throughout and restructure the abstract to focus on key findings rather than methodological details.

Decision Rationale

Major revision is required due to fundamental methodological concerns that affect the study's validity. The hydrological analysis relies on questionable assumptions without proper validation, while the economic evaluation appears incomplete. These issues must be addressed before the manuscript can advance through peer review.