REVIEWER 2 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 2
Recommendation	Reject
Journal	African Journal of Community and Environmental Health
Date	27 Mar 2026

Overall Summary

This study attempts to analyse drainage failures in Juba City using hydrological modelling and cost-benefit optimisation. While addressing an important urban challenge, the manuscript suffers from critical methodological flaws, insufficient data validation, and questionable analytical rigour. The integration of multiple approaches appears superficial rather than systematic, undermining the reliability of findings. The study lacks proper contextualisation within existing literature and fails to address fundamental limitations in data quality and modelling assumptions.

Major Issues

- Inadequate validation of hydrological modelling parameters - reliance on single rainfall station data and the Rational Method without proper calibration against observed flood events raises serious questions about model accuracy
- Questionable data quality and sampling methodology - field survey covering only 26.4km of drainage infrastructure without clear sampling strategy or statistical power analysis
- Superficial integration of multiple methodologies - the claimed integration of hydrological modelling, failure diagnostics, and cost-benefit analysis appears disjointed rather than systematic

Minor Issues

- Poor literature review - insufficient engagement with existing urban drainage studies in similar African contexts
- Inconsistent formatting and presentation - mixed citation styles and incomplete reference list
- Overstated claims of novelty - while focused on Juba, the methodological approach is not particularly innovative

Questions for the Authors

- How were the 28 sub-catchments delineated, and what validation was performed for catchment boundaries?
- What specific green infrastructure interventions were considered in Scenario D, and how were their hydrological benefits quantified?
- How were the 1,166 failure events categorised, and what inter-rater reliability measures were implemented during field surveys?

Required Changes

- Conduct proper hydrological model calibration using observed flood data and multiple rainfall stations
- Provide detailed methodology for field survey design including sampling strategy and quality assurance procedures

- Strengthen literature review with specific focus on urban drainage studies in similar developing city contexts
- Include sensitivity analysis for cost-benefit assumptions and clearly document all economic parameters

Decision Rationale

The manuscript contains fundamental methodological flaws that undermine its scientific validity. The hydrological modelling lacks proper validation, data collection methods are inadequately documented, and the integration of different analytical approaches appears superficial. These issues are too substantial for revision within normal review timelines.