

African Journal of Climate Science and Vulnerability Assessment

Flood-Resilient Road Design Standards for the Sudd Wetland Region of South Sudan

Structured peer-review report for editorial verification

Reviewer	Reviewer 2
Recommendation	Reject
Journal	African Journal of Climate Science and Vulnerability Assessment
Date	24 Mar 2026

Overall Summary

This paper proposes flood-resilient road design standards for South Sudan's Sudd wetland region. While addressing an important practical problem, the study suffers from critical methodological flaws, insufficient validation, and questionable assumptions that undermine its scientific rigour and practical applicability. The analysis appears superficial given the complexity of the wetland environment, and key components lack proper justification or empirical support.

Major Issues

- Inadequate validation of proposed standards through field trials or case studies
- Questionable benefit-cost analysis methodology with unrealistic NPV figures (USD 4.7 million per km) unsupported by transparent calculations
- Over-reliance on remote sensing data (2010-2023) for flood frequency analysis without ground-truthing or consideration of longer-term climate variability

Minor Issues

- Poorly defined study area boundaries and selection criteria for 'three representative road corridors'
- Insufficient discussion of construction feasibility and maintenance requirements in conflict-affected region
- Limited consideration of alternative design approaches or comparative analysis with existing wetland road standards

Questions for the Authors

- What specific validation methods were employed to test the proposed design standards beyond theoretical analysis?
- How were the 25% climate change surcharge and 50-year return period flood level justified given limited historical data?
- What assumptions underlie the benefit-cost analysis, particularly regarding discount rates, maintenance costs, and traffic projections?

Required Changes

- Conduct and report field validation of proposed standards through pilot implementation
- Provide complete methodological details for benefit-cost analysis with sensitivity testing
- Extend hydrological analysis with longer-term data and ground verification
- Address construction and maintenance practicalities in conflict-affected environment

Decision Rationale

The study presents potentially useful practical recommendations but lacks scientific rigour. Major methodological flaws, unvalidated assumptions, and insufficient empirical support render the findings unreliable. The paper requires substantial additional research and validation before being suitable for publication in a peer-reviewed journal.