



REVIEWER'S REPORT

Manuscript No.: IJAR-56067

Title: Taking into account the swelling and shrinkage of expansive soils in the design and behavior of pavements

Recommendation:

Accept after minor revision

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity			Yes	
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.

Acceptance Comment are mentioned below suitable for the paper titled "Taking into account the swelling and shrinkage of expansive soils in the design and behavior of pavements"

Reviewer Comments: Accept after minor revision- Add Abstract in Research paper remaining is perfect

Reviewer Comments –

1. Introduction

The manuscript addresses a critical and practically significant issue in pavement engineering—the influence of swelling and shrinkage behavior of expansive soils on pavement performance. The introduction is comprehensive and well contextualized, clearly linking road infrastructure to socio-economic development and emphasizing the importance of subgrade behavior in long-term pavement stability. The case of the Lama Depression in Benin is appropriately introduced, providing strong geographical and engineering relevance to the study.

2. Literature Review

The literature review is thorough and well documented, with relevant studies cited on the behavior of expansive soils under cyclic wetting–drying conditions. The authors effectively synthesize previous research related to shear strength degradation, compressibility changes, swelling potential, and soil–structure interaction in the Lama Depression and similar regions. The review clearly identifies knowledge

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gaps, particularly the need to integrate swelling–shrinkage behavior into pavement design and performance evaluation, thereby justifying the present study.

3. Solution Approach

The methodological approach adopted in the study is appropriate and scientifically sound. The authors consider mineralogical, geotechnical, and environmental factors governing the swelling–shrinkage behavior of clay soils. The use of experimental investigations under multiple wetting–drying cycles, along with references to numerical modeling and field observations, provides a robust framework to evaluate the response of expansive soils beneath pavements. The approach is well aligned with the objectives of improving pavement design and mitigating premature failures.

4. Results and Discussion

The results clearly demonstrate the adverse impact of shrink–swell cycles on key geotechnical parameters, including reductions in cohesion and friction angle, increased compressibility, and changes in swelling index and permeability. The discussion is well supported by previous studies and effectively interprets how these variations contribute to pavement distress and structural instability. The findings highlight the necessity of accounting for moisture-induced volumetric changes in pavement design, especially in regions dominated by expansive clays.

5. Conclusion

The study makes a valuable contribution to the understanding of expansive soil behavior and its implications for pavement engineering. The conclusions are well supported by experimental evidence and literature findings, emphasizing the need for proper soil characterization, moisture control, and design adaptation in expansive soil regions. Overall, the manuscript is technically rigorous, clearly written, and relevant to both researchers and practicing engineers, and is recommended for acceptance.