African Agricultural Systems Engineering

Geotechnical Engineering Foundations on Expansive Soils in Sudan and Implications for Ghanaian Applications

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Abstract

Expansive soils pose significant challenges for foundation design in Sudan, where they are prevalent due to climatic conditions and soil composition. A review of existing literature and field data from Sudan was conducted to inform a comparative analysis with Ghana's similar geotechnical challenges. Field observations indicated that expansive soil expansion rates varied between 1.5% to 3%, highlighting the need for site-specific design solutions. The findings underscore the importance of understanding local soil behaviour in foundation design, particularly for expansive soils. Geotechnical engineers should consider incorporating historical weather data and soil moisture content into their design processes. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, geosynthetic-reinforced, collapsible, consolidation, permeability, stabilization, sustainability*

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