African Geotechnical Engineering

Design of Low-Cost Irrigation Systems in Drought-Prone Mali

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Abstract

In Mali, drought-prone areas face significant challenges in agricultural productivity due to unreliable rainfall patterns. A mixed-method approach was employed, combining field surveys with cost-benefit analysis to assess system viability. Of the tested systems, a gravity-fed drip irrigation model showed an average yield increase of 30% compared to traditional methods in similar conditions. The study recommends widespread adoption of low-cost gravity-fed drip irrigation for sustainable agricultural development in Mali's drought-prone regions. Local governments and NGOs should prioritise the implementation of these systems, particularly in small-scale farming communities. Irrigation Systems, Low-Cost Solutions, Drought-Prone Areas, Mali The maintenance outcome was modelled as $Y\{\} = beta0 + beta1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, AgriculturalEngineering, IrrigationDesign, SustainableDevelopment, DroughtTolerance, Hydrology, WaterManagement*

ABSTRACT-ONLY PUBLICATION

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