



Designing Affordable Irrigation Systems for Drought Prone Regions in Mali

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Abstract

Irrigation is crucial for sustainable agriculture in Mali’s drought-prone regions, where water scarcity limits crop yields and farmer livelihoods. A mixed-method approach combining surveys with technical assessments to identify suitable technologies for the region's climate and soil conditions. An initial survey indicated a need for water-efficient drip irrigation systems in 70% of surveyed farms, while technical feasibility studies showed that low-pressure drip systems could be cost-effective up to a scale of 50 hectares per system. Low-cost drip irrigation systems are feasible and economically viable for Mali’s drought-prone regions, requiring further piloting before widespread adoption. Pilot projects should commence with a focus on small-scale farmers in the most vulnerable districts to validate technology performance and cost-effectiveness. Irrigation Systems, Drip Irrigation, Low-Cost Solutions, Mali Agriculture The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: African Geography, Sustainable Agriculture, Low-Cost Technologies, Drought Tolerance, Integrated Water Management, Precision Irrigation Systems, Small-Scale Engineering Solutions

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