



# Solar-Powered Maize Irrigation in Senegal: Water Usage Reduction One Year On

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### Abstract

Recent advancements in solar technology have led to the development of innovative irrigation systems for agricultural applications, particularly in arid regions like Senegal where water scarcity is a significant challenge. The research involved deploying a total of 15 solar-powered irrigation units across three different farms in Senegal. Data collection included daily water usage measurements and meteorological data for analysis. Initial results indicate that the solar-powered systems have reduced maize irrigation water usage by approximately 23%, with no significant variation in crop yield when compared to traditional methods. The findings suggest that solar-powered irrigation is a viable solution for addressing water scarcity issues in Senegalese agriculture, particularly suitable for small-scale farmers who can afford the initial investment of 100 per unit . Further research should focus on scaling up the technology to larger farms and exploring potential economic benefits.  $\hat{\theta} = \operatorname{argmin}_{\theta} \sum_i \ell(y_i, f(\theta(x_i))) + \lambda \sqrt{\theta}$ , with performance evaluated using out-of-sample error.

**Keywords:** Solar Panels, Agricultural Irrigation, Maize Production, Water Management, Renewable Energy, Drip Irrigation Systems, Precision Agriculture

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