



Precision Irrigation Systems Adoption Dynamics in Central American Highlands: An African Perspective

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Abstract

Precision irrigation systems are crucial for sustainable crop production in arid regions such as the Central American Highlands. However, their adoption and impact vary significantly among different farming communities. A mixed-methods approach was employed, including surveys, interviews, and case studies among Kenyan farmers who had adopted or were considering adopting precision irrigation systems. Statistical analysis of survey data used a logistic regression model to predict adoption likelihood based on socioeconomic variables. The study revealed that education level was the most significant predictor of system adoption (OR = 1.67, CI: [1.03-2.71]), with farmers who had received formal agricultural training being more likely to adopt precision irrigation systems compared to those without such training. The findings suggest that enhancing agricultural education can significantly increase the likelihood of Kenyan farmers adopting and benefiting from precision irrigation systems, contributing to sustainable crop production in their regions. Policy makers should invest in agricultural extension services to provide formal training programmes for farmers. Farmers' cooperatives could also be leveraged to organise workshops and field days on best practices for using precision irrigation systems. Precision Irrigation Systems, Adoption Dynamics, Central American Highlands, Kenyan Farmers, Logistic Regression

Keywords: *Kenyan, GIS, Precision Agriculture, Participatory Action Research, Sustainable Development, Remote Sensing, Soil Moisture Mapping*

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