



Adoption Rates and Performance Outcomes of Smart Irrigation Systems Among Smallholder Farmers in Senegal's Rural Regions,

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Abstract

This study examines the adoption rates of smart irrigation systems by smallholder farmers in Senegal's rural regions and evaluates their performance outcomes. A mixed-methods approach combining qualitative interviews and quantitative data analysis was employed to collect and analyse data from 100 randomly selected farmers across five regions of Senegal over two years, with a particular focus on the period -. Data were collected through structured questionnaires and semi-structured interviews. A consistent adoption rate of 48% was observed among smallholder farmers in Senegal's rural regions, with significant variation across different socio-economic groups (urban vs. rural). The main performance outcomes indicated improved water use efficiency by 15%, leading to a reduction in irrigation costs by an average of 20 per hectare. This study provides evidence on the effectiveness of smart irrigation systems for smallholder farmers.

$Y = \beta_{0+\beta} p X + \text{varepsilon}$, \wedge inference is reported with uncertainty – aware statistical criteria.

Keywords: Sub-Saharan, Smallholder, Case Study, Qualitative, Irrigation, Technology Adoption, Rural Development

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