



Optimising Rainwater Harvesting Systems for Sustainable Agriculture in Upper Guinea Region: A Theoretical Framework for Farmer Adoption and Yields Analysis

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Abstract

Optimising rainwater harvesting systems (RWSs) for sustainable agriculture in the Upper Guinea Region of West Africa is crucial to address water scarcity and improve crop yields among smallholder farmers. A mixed-methods approach combining literature review, expert interviews, and quantitative modelling will inform the theoretical framework's development. This theoretical framework provides a robust foundation for future research into sustainable agriculture solutions, particularly focusing on RWS optimization and farmer engagement strategies. Strategies to enhance uptake should include targeted government subsidies, community-based training programmes, and demonstration projects showcasing the benefits of improved RWS systems.

Keywords: *Sub-Saharan, AgriculturalEcology, SustainableDevelopment, FarmerAdoption, WaterStress, Hydrology, EcosystemServices*

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