African Quantum Computing (Theoretical - Pure Science)

Eco-Friendly Agricultural Practices in Ghana: A Methodological Framework for Economic and Soil Health Assessments Among Smallholder Farmers

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Abstract

Agriculture in Ghana's southern coastal regions faces challenges such as soil degradation and economic instability among smallholder farmers. The study employs a mixed-method approach combining quantitative surveys with qualitative interviews. A linear regression model is used to analyse economic performance data, while uncertainty analysis using bootstrapping techniques is applied to assess the robustness of findings. There was a significant positive correlation ($r = 0.75$) between the implementation of eco-friendly practices and improved soil health indicators such as organic matter content. The methodological framework effectively quantifies economic benefits and soil health impacts, providing actionable insights for sustainable agricultural development in Ghana. Policy makers should incentivize farmers to adopt eco-friendly practices through subsidies and training programmes based on the model's findings. Agriculture, Smallholder Farmers, Eco-Friendly Practices, Soil Health, Economic Benefits

Keywords: *Sub-Saharan, GIS, STS, Qualitative, Quantitative, Precision Agriculture, Participatory Rural Appraisal*

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