



# Soil Fertility Enhancement through Water Harvesting Systems in Desertified Villages of Sudan: A Mixed-Methods Investigation in Kenya

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## Abstract

Desertification in Sudan has led to significant soil degradation, affecting agricultural productivity and food security. A mixed-methods approach combining quantitative surveys with qualitative interviews to assess the effectiveness of water harvesting systems in improving agricultural yields and soil health. Water harvesting significantly increased crop yields by an average of 30% compared to traditional farming methods, particularly among small-scale farmers who adopted the system. The mixed-methods study supports the adoption of water harvesting systems for enhancing soil fertility in desertified regions and highlights their potential as a sustainable agricultural intervention. Recommendation for policymakers is to implement community-based water harvesting projects alongside extension services to ensure widespread adoption and long-term benefits.

**Keywords:** *Desertification, Soil Fertility, Water Harvesting, Mixed Methods, Quantitative Analysis, Qualitative Research, Sustainable Agriculture*

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