



Soil Health Metrics and Water Security Strategies in Ethiopian Irrigation Agriculture: A Theoretical Framework

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Abstract

Soil health metrics are essential for sustainable agriculture, particularly in regions with limited water resources like Ethiopia's Tigray region. Water security strategies that prioritise soil health can enhance irrigation efficiency and reduce environmental degradation. Theoretical analysis will be employed, integrating existing research on soil health metrics, water security, and agricultural best practices from Ethiopia and other similar contexts. The theoretical framework provides a robust foundation for developing and evaluating interventions aimed at improving soil health and enhancing water security in Ethiopian irrigation agriculture. Implementing the recommended strategies will require collaboration between agricultural extension services, farmers' cooperatives, and local government bodies to ensure widespread adoption and sustainability of practices.

Keywords: *African Soil Health, Water Footprint, Hydrology, Conservation Agriculture, Sustainable Development Theory*

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