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# Enhanced Irrigation Techniques and Yield Enhancement in Eastern Ethiopian Semi-Arid Villages: A Soil Moisture Focus Study,

**Muluqit Haileamara**[1], **Abiy Yohannes**[2,3]

[1] Department of Interdisciplinary Studies, Debre Markos University

[2] Department of Advanced Studies, Adama Science and Technology University (ASTU)

[3] Department of Advanced Studies, Debre Markos University

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**Correspondence:** mhaileamara@yahoo.com

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**Author notes**

*Muluqit Haileamara is affiliated with Department of Interdisciplinary Studies, Debre Markos University and focuses on Physics research in Africa.*

*Abiy Yohannes is affiliated with Department of Advanced Studies, Adama Science and Technology University (ASTU) and focuses on Physics research in Africa.*

## Abstract

Enhanced irrigation techniques have been proposed as a solution to improve crop yields in semi-arid regions of Ethiopia where soil moisture levels are critical for agricultural productivity. A mixed-method approach was employed, including pre- and post-intervention surveys, yield assessments, and soil moisture measurements across selected villages. Data collection took place over a single year from January to December. Soil moisture levels increased by an average of 15% in irrigated fields compared to non-irrigated areas, resulting in a 20% higher crop yield on farms adopting enhanced irrigation techniques. The findings suggest that the adoption of enhanced irrigation practices significantly enhances both soil moisture and agricultural productivity in semi-arid Ethiopian villages. Further research should explore long-term sustainability and cost-effectiveness of these irrigation methods, as well as their impact on local water resources. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

**Keywords:** *Geographic, Semi-arid, Soil moisture, Irrigation techniques, Adoption study, Methodology, Sustainability*

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