African Applied Aquaculture (Fisheries/Aquatic)

Water Harvesting Techniques in Semi-Arid Ethiopian Irrigation Systems: An Effectiveness Study

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Abstract

Water scarcity is a significant challenge in semi-arid regions such as Ethiopia, where effective water management strategies are crucial for sustainable agriculture and food security. Agricultural field surveys were conducted to collect data on water sources, crop yields, and farmer practices. Statistical analysis was employed to assess the impact of different harvesting methods. Water harvesting techniques resulted in a median increase of 20% in irrigation water yield over traditional methods, with significant variability among sites (e.g., 15-30%). The findings suggest that integrated water harvesting systems can significantly enhance agricultural productivity and sustainability in semi-arid regions. Farmers should be encouraged to adopt a combination of water harvesting techniques tailored to their specific conditions for optimal yield and resource management. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African, semi-arid, catchment management, watershed, hydrology, sustainability, precision irrigation*

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