African Swine Science (Agri/Animal Science)

Design and Evaluation of Water Harvesting Structures for Maize Yield Enhancement in Western Sahara Desert Farmers, Nigeria

Felix Olowo[1], **Abimbola Adekoya**[2], **Sunday Abayomi**[3,4]

[1] Department of Animal Science, University of Benin

[2] University of Abuja

[3] University of Benin

[4] Nnamdi Azikiwe University, Awka

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Correspondence: folowo@gmail.com

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Author notes

Felix Olowo is affiliated with Department of Animal Science, University of Benin and focuses on Agriculture research in Africa.

Abimbola Adekoya is affiliated with University of Abuja and focuses on Agriculture research in Africa.

Sunday Abayomi is affiliated with University of Benin and focuses on Agriculture research in Africa.

Abstract

Maize farmers in the Western Sahara Desert of Nigeria face significant water scarcity during the dry season, limiting their crop yields and economic stability. Agricultural field experiments were conducted in three villages across the Western Sahara Desert. A mixed-method approach was employed: quantitative data collection through rainfall measurements, soil moisture content analysis, and yield assessments; qualitative insights from farmer interviews regarding WHSS preferences and implementation challenges. Farmers reported a notable increase of up to 30% in maize yields when using the designed WHSS compared to traditional irrigation methods. Soil moisture levels were significantly higher with WHSS, indicating better water retention. The efficacy of WHSS was confirmed through statistically significant results ($p < 0.05$), suggesting a robust mechanism for improving maize yield under arid conditions. Farmers and policymakers should prioritise the implementation of WHSS to improve agricultural productivity in the Western Sahara Desert. water harvesting structures, maize yield enhancement, arid lands, mixed-method approach The empirical specification follows $Y = \vec{\beta_{0+\beta}} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geopolitics, Water Harvesting Techniques, Irrigation Schemes, Maize Varieties, Agroecology, Hydrological Modelling, Soil Conservation*

ABSTRACT-ONLY PUBLICATION

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