

Abstract

# Suitability Evaluation of Underutilized Crops Under Future Climate Change Using Ecocrop Model: A Case of Bambara Groundnut in Nigeria

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**Abstract:** The agricultural crop system depends on a few major staple crops such as rice, maize, wheat, sorghum, soybeans, amongst others for food production, leaving certain crops underutilized. Even though these underutilized crops have the potentials of diversifying and sustaining the food and nutrition systems while presenting different resilience to climatic conditions. As the world's population continues to increase and climate change keeps occurring, these major staple crops are being negatively affected. This study focuses on evaluating the spatial suitability of Bambara groundnut (*Vigna subterranea* (L.) Verdc.), an indigenous underutilized African legume under past and future climate scenarios in Nigeria, West Africa, where farmers depend mostly on rainfed agriculture. Ten bias-corrected CMIP5 Global climate models simulation downscaled by the Coordinated Regional Climate Downscaling Experiment (CORDEX) regional climate model, RCA4 under the Representative Concentration Pathway (RCP) 8.5 scenario was used to drive the crop suitability model-Ecocrop. The spatial changes in Bambara groundnut suitability were evaluated under 1 past climate period -historical (1980-2010), and 3 future climate period - near future (2010-2040), mid-century (2040-2070), and end century (2070-2099). Our result projects southern Nigeria to remain suitable and an increase in the suitable areas across other parts of the country in future climates. Projected changes were observed in the planting month for Bambara groundnut. The study is relevant and will contribute to the discussions of increasing the number of crops cultivated under climate change as an adaptation strategy towards ensuring a sustainable food system in Nigeria.

**Keywords:** Bambara groundnut; Ecocrop; crop suitability; Nigeria; underutilized crops; food security; climate projection

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