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Sustainable Urban Farming in Sub-Saharan Africa: A Review of a Coupled Single-Loop Aquaponics System in Nigeria

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Abstract

Countries in West Africa are adversely affected by climate change (erratic rainfall and rising temperature) resulting in floods, desertification, drought and sea level rise. These events are anticipated to have negative impacts on agricultural development on the continent, ultimately, contributing to food insecurity and environmental degradation. This implies that the production capacity of agrarian communities is unable to meet the food demand of the growing urban population. Can sustainable and innovative urban farming technology such as aquaponics achieve food security as well as sustainable development in countries vulnerable to climate change? This study uses inferential statistic to examine the plant growth performance in micro-scale aquaponics and specific growth rate per day (SGR) for the fish growth performance vis-à-vis conventional urban farming production. A quantitative analysis use to examine the barriers to adoption based on survey of (five) urban aquaculture practitioners in Lagos, Nigeria. Literature review was use to assess the economic feasibility of a small-scale aquaponics system in developing countries based on Net-Discounted Benefit-Cost Rate (DBCR). The results suggest that aquaponics can improve food security through fish and vegetable production and it is likely that urban farming practitioners will adopt the technology if support mechanism are in place. Aquaponics systems present a novel opportunity to promote environmental conservation as well as sustainable food production and consumption in urban areas in Western Africa if adequate financial credit and knowledge transfer is provided.

Keywords: Urban farming; aquaponics; food security; adoption; Nigeria; Africa.

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