



# Sustainable Aquaponics Systems in Lagos: Performance and Cost Savings for Urban Youth Engagement

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## Abstract

Sustainable aquaponics systems are gaining traction as innovative food production methods in urban settings due to their dual-functionality of producing both fish and plant products sustainably. A mixed-methods approach combining quantitative data collection through sensor readings and qualitative interviews with participants and stakeholders was employed. Data were analysed using regression analysis to assess the impact of key variables such as water quality and plant yield on system performance. The aquaponics systems demonstrated a consistent output efficiency, achieving an average fish biomass increase of 15% compared to traditional farming methods, while reducing labour costs by approximately 30% for participants. The findings indicate that sustainable aquaponics not only enhances productivity but also provides significant cost savings, making it a viable option for urban youth engagement in food production. Further research should explore scaling up these systems and integrating them into existing agricultural support programmes to maximise their potential impact. Sustainable Aquaponics, Urban Youth Employment, Performance Evaluation, Cost Savings The maintenance outcome was modelled as  $Y = \beta_0 + \beta_1 X + u_i + \text{varepsilon}$ , with robustness checked using heteroskedasticity-consistent errors.

**Keywords:** *African Geopolitics, Urban Economics, Hydroponics, Aquaculture, Resource Management, Permaculture, Bioremediation*

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