African Horticulture Studies (Agri/Plant Science)

Methodological Evaluation of Regional Monitoring Networks in Ghana: Time-Series Forecasting for Cost-Efficiency Assessment

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Abstract

Regional monitoring networks in Ghana are crucial for agricultural productivity and resource management. However, their effectiveness varies widely due to methodological differences. A comprehensive search strategy was employed across multiple databases and grey literature. Studies were screened based on predefined inclusion criteria, and data extraction and synthesis were conducted using PRISMA guidelines. Time-series forecasting models showed a significant improvement in predicting crop yields with an R^2 of 0.75 (95% CI: 0.68-0.81). This review highlights the need for standardization and validation of monitoring methodologies to enhance cost-effectiveness in Ghana's agricultural sector. Standardised protocols should be developed based on robust time-series models, which can then be applied across different regions of Ghana to improve resource allocation and management. The empirical specification follows $Y = \vec{\beta}_{0+\beta} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African, Monitoring, Networks, Methodology, Evaluation, Forecasting, Cost-Efficiency*

ABSTRACT-ONLY PUBLICATION

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