African Glacial Studies (where applicable - Earth Science)

Methodological Evaluation of Field Research Stations in Ethiopia: A Time-Series Forecasting Model for Yield Improvement Analysis

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Abstract

Field research stations in Ethiopia have been pivotal for agricultural studies, yet their effectiveness varies significantly across different regions and time periods. A comprehensive search of peer-reviewed journals was conducted using databases such as PubMed, Web of Science, and Google Scholar. Studies published between and were included if they focused on methodology evaluation or utilised time-series analysis for yield improvement in Ethiopia's agricultural context. The review identified a need for more robust data collection methods to enhance the reliability of forecasts regarding crop yields, particularly in regions with varying climate conditions. This systematic literature review highlights the importance of consistent and standardised methodologies across research stations to ensure valid yield improvement predictions. Researchers should prioritise the adoption of advanced statistical models like ARIMA for more accurate forecasting of future crop yields. Additionally, inter-station data sharing initiatives are recommended to improve regional agricultural planning. The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African geography, Methodological evaluation, Field studies, Time-series analysis, Yield forecasting, Agricultural research, Geographic variation*

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