African Security Studies (Political Science focus)

Field Research Stations in Ghana: A Time-Series Forecasting Model for Adoption Rates Evaluation

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Abstract

Field research stations are instrumental in socio-economic development projects in Ghana. These stations serve as hubs for data collection and analysis, but their effectiveness varies across different regions. A comparative study approach was adopted, analysing data from various regions with differing levels of station adoption. A time-series forecasting model incorporating ARIMA (AutoRegressive Integrated Moving Average) methodology was used to forecast adoption rates. The analysis reveals a significant upward trend in the number of stations across Ghana over the past decade, indicating an increasing acceptance and integration of these facilities into regional development strategies. The time-series forecasting model demonstrated high predictive accuracy, with a confidence interval suggesting that by , approximately 75% of identified regions will have adopted at least one field research station. Based on the findings, policymakers should prioritise investment in infrastructure and training programmes to further enhance the adoption and sustainability of these stations. Field Research Stations, Adoption Rates, Time-Series Forecasting, ARIMA Model, Socio-Economic Development Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, African, Ghanaian, Socioeconomic, Systems, Analysis, Modelling*

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