African Applied Remote Sensing
(Technology/Methodology)

Methodological Evaluation of Regional Monitoring Networks in South Africa Using Time-Series Forecasting for Adoption Rate Measurement

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Abstract

In recent years, South Africa has implemented regional monitoring networks to track environmental changes and policy implementation effectiveness. We employed a multiple linear regression model for forecasting adoption rates based on historical data from to . The uncertainty associated with these predictions was quantified using robust standard errors, providing a range within which the true value is likely to fall with a certain confidence level. A notable finding was that the model accurately predicted adoption rates in regions where existing data showed consistent trends, demonstrating its effectiveness in measuring policy uptake across diverse environmental sectors. The study concludes that time-series forecasting models can be effectively utilised for monitoring and evaluating regional monitoring networks' performance in South Africa. The findings provide a robust methodological basis for future research and policy implementation evaluations. Future work should explore the integration of additional variables to enhance forecast accuracy, particularly focusing on socio-economic factors affecting policy adoption rates. 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, regression analysis, econometrics, forecasting, spatio-temporal models, environmental indicators, spatial statistics*

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