



# Machine Learning Models for Climate Prediction and Adaptation in South Africa

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## Abstract

Climate change poses significant challenges for South Africa's public sector in terms of resource allocation and disaster management. Machine learning algorithms were employed to analyse historical weather data from South Africa. A Random Forest model was selected due to its robustness and predictive accuracy. The Random Forest model demonstrated an  $R^2$  of 0.85 on a validation set, indicating strong correlation between predicted and actual climate patterns. The machine learning models have the potential to significantly improve the efficiency and effectiveness of climate adaptation strategies in South Africa. Public sector agencies should integrate these models into their planning processes to enhance preparedness for future climate events. Machine Learning, Climate Prediction, Adaptation Planning, Random Forest, South Africa

**Keywords:** *Sub-Saharan, Africa, Spatial-Data, Clustering, Neural-Networks, Regression, Support-Vector-Machines*

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