African Volcanology and Geochemistry (Earth Science)

Revisiting Remote Sensing and GIS in Ethiopian Environmental Monitoring: A Replication Study

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Abstract

Remote sensing and Geographic Information Systems (GIS) have been utilised in environmental monitoring studies across Africa, including Ethiopia, to assess land use changes, monitor natural resources, and predict environmental impacts. The methodology involves re-analysing existing satellite imagery data from Ethiopia using standard remote sensing techniques, including spectral analysis and image classification. The findings are integrated with newly collected GIS spatial data on land use patterns. A significant proportion (75%) of previously identified forested areas showed no change in cover over the study period, indicating stable conditions despite potential threats from climate variability. The replication confirms the reliability and effectiveness of remote sensing and GIS methodologies for environmental monitoring in Ethiopia, particularly in identifying persistent land cover changes. Future research could explore the integration of machine learning algorithms to enhance predictive models for environmental dynamics and impact assessment. Remote Sensing, GIS, Environmental Monitoring, Ethiopia The empirical specification follows $Y = \beta_{0+\beta}^{\rightarrow} p\, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *African Geography, Remote Sensing, GIS, Spatial Analysis, Land Use Change, Environmental Monitoring, Ecological Informatics*

ABSTRACT-ONLY PUBLICATION

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