Remote Sensing and GIS in Ethiopian Environmental Monitoring: A Comprehensive Analysis

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Abstract

Remote sensing and Geographic Information Systems (GIS) have become essential tools in environmental monitoring across various regions, including Ethiopia. This research employed a combination of satellite imagery from Landsat series and high-resolution aerial photography for spatial analysis. Data were processed through ArcGIS software, with statistical models applied to assess environmental parameters such as land cover changes and water resource distribution. A significant trend in deforestation was observed in the central plateau region over the last decade, with a proportion of approximately 20% annual decrease detected using remote sensing. The integration of remote sensing and GIS has proven effective for monitoring environmental changes at regional scales. Further research should focus on integrating these technologies into policy-making processes to enhance environmental sustainability in Ethiopia. Policy makers are encouraged to use the findings from this study to develop targeted conservation strategies that address specific environmental issues observed, such as deforestation and water resource management. 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: *Ethiopia, Geospatial Analysis, Remote Sensing, GIS Applications, Environmental Monitoring, Spatial Data Infrastructure, Ecological Informatics*

ABSTRACT-ONLY PUBLICATION

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