



Satellite Imagery and AI in Land Use Mapping and Monitoring in Kenya: A Systematic Review

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Abstract

Satellite imagery and artificial intelligence (AI) have been increasingly applied in land use mapping and monitoring to support sustainable development initiatives. A comprehensive search strategy was employed to identify relevant studies, including electronic databases such as PubMed, Scopus, and Google Scholar. Studies were included if they utilised at least one type of satellite imagery or applied AI algorithms for land use analysis. The review identified a consistent trend towards the integration of deep learning models in processing high-resolution satellite data to enhance accuracy in land cover classification and monitoring over time. AI-driven methods have shown promise in improving the efficiency and precision of land use mapping, but challenges related to data quality and availability persist. Further research should focus on developing robust AI models that can operate effectively with limited satellite imagery datasets and incorporate interdisciplinary approaches for enhanced accuracy. Satellite Imagery, Artificial Intelligence, Land Use Mapping, Kenya, Systematic Review
Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda I_{Vert\theta} r_{Vert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, GIS, remote sensing, machine learning, kriging, geographic information systems, spatial analysis*

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