

Monitoring Urban Green Space Cover Change Using GIS and Remote Sensing in Two Rapidly Urbanizing Cities, Debre Berhan and Debre Markos, Ethiopia

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Abstract : Monitoring the amount of green space in urban areas is important for ensuring sustainable development and proper management. The study analyzed changes in urban green space coverage over the past 20 years in two rapidly urbanizing cities in Ethiopia, Debre Berhan and Debre Markos, using GIS and remote sensing. The researchers used Landsat 5 and 8 data with a spatial resolution of 30 m to determine different land use and land cover classes, including urban green spaces, barren and croplands, built-up areas, and water bodies. The classification accuracy ranged between 90% and 91.4%, with a Kappa Statistic of 0.85 to 0.88. The results showed that both cities experienced significant decreases in vegetation cover in their urban cores between 2000 and 2020, with radical changes observed from green spaces and croplands to built-up areas. In Debre Berhan, barren and croplands decreased by 32.96%, while built-up and green spaces increased by 357.9% and 37.4%, respectively, in 2020. In Debre Markos, built-up areas increased by 224.2%, while green spaces and barren and croplands decreased by 41% and 5.71%, respectively. The spatial structure of cities and planning policies were noticed as the major factors for big green cover change. Thus it has an implication for other rapidly urbanized cities in Africa and Asia. Overall, rapid urbanization threatens green spaces and agricultural areas, highlighting the need for ecological-based spatial planning in rapidly urbanizing cities.

Keywords : green space coverage, GIS and remote sensing, Landsat, LULC, Ethiopia

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