

## Balancing Spatial Utilization and Sustainability in Residential Areas: Lessons from Kediri Regency, East Java

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### Abstract

The objective of this study is to analyze the current condition of land use within the context of spatial planning in Kediri Regency, and to formulate policy directions for sustainable land management based on land-use change transition matrix analysis. The analytical approach employed in this study involves spatial-temporal interpretation using a Geographic Information System (GIS), utilizing Landsat-7 ETM, Landsat-8 OLI imagery, and Google Earth data, combined with a mixed-method approach. The results of the spatial analysis indicate that forest land has experienced a continuous decline over time. In 2008, the forest area was recorded at 5,363 hectares, which decreased to 5,241 hectares in 2013, further declined to 5,035 hectares in 2018, and reached 4,906 hectares in 2023. In contrast, built-up land has shown a significant increase, reflecting ongoing urbanization in Kediri Regency and indicating growing environmental pressure. The built-up area expanded from 25,698 hectares in 2008 to 26,762 hectares in 2013, increased further to 27,955 hectares in 2018, and rose significantly to 30,749 hectares in 2023. The dynamics of land-use change in Kediri Regency during the 2008–2023 period demonstrate a substantial transformation from an agrarian landscape toward a more urbanized region. Spatial analysis reveals that the rapid expansion of built-up land has become the dominant phenomenon, driven by population growth, urbanization, and regional economic development. Therefore, sustainable spatial planning policies are urgently needed through the integration of spatial and temporal data, control of land conversion, and adaptive policy frameworks to ensure a balance between economic development, environmental sustainability, and long-term societal well-being.