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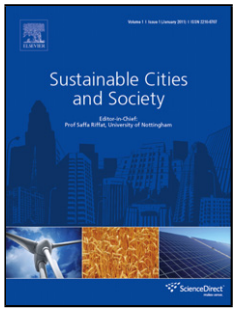

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Spatiotemporal patterns of urban land use change in the rapidly growing city of Lusaka, Zambia: Implications for sustainable urban development

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HIGHLIGHTS

- The paper examines the spatiotemporal patterns, intensity and spatial explanatory factors of urban land use changes in Lusaka, Zambia.
- Spatial dependency modeling compares patterns of unplanned and planned development.
- Urban land use expansion was more intense during the 2000s than during the 1990s.
- Results show Lusaka as a highly unplanned city dominated by informal settlements
- Evidence of informal settlements spatial dependency on patterns of commercial and industrial, and planned medium to high density residential land uses

Abstract

This study examines the spatiotemporal patterns of urban land use (urban-LU) change in the rapidly urbanising city of Lusaka, Zambia, during the 1990-2000 and 2000-2010 periods, using geospatial tool and techniques. The results show that the city experienced rapid urban growth, with about a 233% increase in the total urban-LU area from 1990 - 2010. The results also show that urban-LU expansion was more intense during the 2000s than during the 1990s. Spatially, the city displays a disordered pattern of urban-LU associated with the pattern of major roads and the city centre, which draws its legacies from the colonial era. Lusaka has emerged as a highly unplanned city with approximately 40% of the city representing unplanned residential land use dominated by informal settlements (30%). The growth of commercial and industrial land use has also been consistent with high-density residential land uses. The growth of planned residential, and public institutions and service land uses has been slow. The results further reveal spatial dependency of informal settlements on commercial and industrials, and planned high density residential land uses. The study discusses and offers vital insights for strategic urban planning that can control the observed unplanned urban growth and stimulate sustainable urban development.

Keywords: Urban land use; Unplanned urban development; Intensity and gradient analysis; Spatial dependency modeling; GIS; Lusaka

1. Introduction