Geospatial framework for predicting and quantifying landcover changes derived from current and planned transportation infrastructures in Belo Horizonte - Brazil

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Abstract

This paper presents an experimental implementation to model the dynamics of ground cover in order to predict scenarios of urban growth in Belo Horizonte city, therefore investigate the spatial influence of the planned transportation infrastructure with a foreseen horizon for 2030. The experimental approach was designed to integrate a GIS-based Multi-Criteria Decision Making and a Land Change Modeling to deliver visual and tabular results. The scenarios were computed using the past and present land cover and transportation infrastructure, as well as using the planned infrastructure not yet implemented. First the predictive model was tested and validated for 2011 with 82.61% accuracy. Then three predictive scenarios were simulated for 2030. The results indicate a strong tendency for urban landcover changes to occur nearby the highway corridors. The model provided a series of thematic maps that critically illustrate cause-effect of transportation infrastructure for planners and decision makers in short, mid and long term perspectives. The method is highly transferrable and limited solely by the availability of sources of geospatial data and coordination with stakeholders.

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