

Land use/cover change and urban growth in african major cities:Modeling and predicting urban Growth in Nairobi city

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Abstract: Africa's urban population growth has been very rapid, averaging about 5 percent per year over the last two decades. As a result many urban areas have experienced dramatic growth which is seriously outstripping the capacity of most cities to provide adequate services for their citizens. The rapid population growth, expected to double by 2030, is leading to dramatic sprawl with associated undesirable environmental and social consequences. Using Nairobi as an example of a major African city, we studied the dynamics of land use and land cover changes using satellite data and addressed the need for urban management tools that can guide sustainable urban planning policies. Urban growth simulation for Nairobi city using Cellular Automata (CA) that integrates biophysical factors with dynamic spatial modelling is described. The model was calibrated and tested using time series of urbanized areas derived from remote sensing imageries, and future growth projected out to 2030. The simulation results are realistic and relatively accurate, confirming the effectiveness of the model.

The results showed that the model is very useful for urban modelling and an effective tool to foresee the spatial consequences of poor planning policies in the context of many African cities. The forecast for Nairobi shows an unsustainable sprawled urban growth. The results show that urban simulations can represent a useful approach to an understanding of the consequences of current planning policies or their incompleteness.