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# Application of Markov chain & cellular automata based model for prediction of Urban transitions

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### Abstract:

Modeling of Urban transitions and predictions of future expansions is indispensable for examining urban planning policies and environmental management practices. In this paper, urban growth was predicted using Cellular Automata (CA) and Markov chain based model. An integrated model implementing CA and Markov chain analysis, embedded in Geographic Information System called Land change modeler(LCM) module of Terrset software is used to predict the future urban growth. Vijayawada city, the new capital of Andhra Pradesh state, India is taken as a case study. Remote sensing satellite data from the years 1977, 1996 & 2015 are used to produce Land Use Land Cover (LULC) images. Using LULC images of 1977 and 1996, LULC of 2015 was predicted by LCM. The same was validated with the already developed LULC image and got satisfactory accuracy. Using LULC of 1977 and 2015, future LULC of 2053 was predicted from which urban growth extracted and presented. The urban transition from the past to present and to the future is also presented by images. Change in areas is presented in a tabular form. Thus the application of geo-simulation techniques like Cellular Automata and Markov Chain was demonstrated through this paper.

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