Urban sprawl and land use/land-cover transition probabilities in peri-urban Kumasi, Ghana

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Abstract

This paper examines Land Use and Land Cover (LULC) transition probabilities and its implications for Kumasi Metropolis using remote sensing image analysis technique. Methods used for the study include sub-setting of satellite images for the metropolis using the metropolitan shapefile boundary and classification of the images using maximum likelihood image classification algorithm. A Markov Model was applied to predict probabilities of LULC changes in 15 years (2016 - 2031). Study results show the probability of urban lands changing to agricultural land as low and so is the probability of farmland transitioning to urban land use. Vegetation however shows a high probability of change to built-up area while the likelihood of change from water to other land cover types is not a possibility. The study recommends enforcement of relevant land use policies backed by vigorous public education to make sustainable urban land use in the Metropolis a reality. Also, vertical rather than horizontal construction of buildings could stem the sprawling city.