Monitoring and Prediction of Land Use in Enugu Urban, Nigeria, Using Gis and Remote Sensing

Victor Chukwuemeka Nnam (Nigeria)

SUMMARY

Enugu Urban (The Coal City) traditionally serves as the capital of the South East geopolitical zone in Nigeria. It is one of the fastest developing cities in the nation, thus the need to monitor and predict changes in land use of the city. The purpose of this study is to carry out an appraisal of the rate at which Enugu urban have developed over the recent decades with focus on land use and to predict the rate of projected development in the next few decades; from the results of the study, recommend strategies for the mitigation of the anticipated challenges. In this study, remote sensing and GIS techniques were applied in the monitoring of Enugu urban for a period of 30 years (1989 to 2019) and a predictions for two decades (2029 and 2039) using Statistical Regression Analysis. Supervised (Full Gaussian) classification was applied on four LandSat archive satellite imageries using the Maximum Likelihood Algorithm in ILWIS Academic 3.2. The five land use classes that were studied were built up areas, farm lands, forests, bare lands and rivers. A study area of approximately 24,500hectares covering Enugu Urban was used as a test bed, the land use for built up area in 1989, 1999, 2009 and 2019 were 3,741hectares(15.4%), 4,100hectares(16.8%), 8,268hectares(34.4%), and 11,055 hectares(45%) respectively while the regression prediction results for 2029 and 2039 were 15,119 hectares(61.7%) and 21,361 hectares(87.1%) respectively. Consequent upon the results of this study, significant changes are evident in the land use of Enugu Urban (The Coal City) within the study period as well as the forecast period. The statement of results above serves as an early warning for an impending slum development. These results are verified statistics with which Enugu state government will plan and make policies to mitigate the looming slum challenges and harness revenue as well as resources that will come as a result of the predicted changes in land use in the state.

Keywords: Land Use; Monitoring; Prediction; GIS; Remote Sensing

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