

**Simulation of urban development for sustainable planning: a case of Kigamboni Municipality,
Dar es Salaam Region, Tanzania.**

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Most of Tanzanian Cities and Towns grow spontaneously without compromising with the existing urban plans. GIS and Remote Sensing techniques were used in this study to predict the spatial growth of the Kigamboni municipality as a case study of a spontaneous urban growth for guiding sustainable urban development. A series of multi-spectral satellite images; *Thematic Mapper (TM)* of 1989, *Thematic Mapper (TM)* of 1998, *Enhanced Thematic Mapper Plus (ETM+)* of 2007 and *Landsat 8 Operational Land Imager (OLI)* of 2016 were used to quantify spatio-temporal environmental dynamics and to simulate urban growth in the next 14 years. Social economic household's survey data were employed to identify and describe the parameters that influenced land use/cover change and urban growth. Supervised classification method with Maximum likelihood was used to identify five LULC of the scene area, namely vegetation, built-up (urban), wetland, bare land and water bodies. GIS based on Cross-tab method was used to detect LULC change, also the CA_Markov module was used to simulate future LULC change from 2016 to 2030. LULC maps were developed from which statistics were extracted to show spatial temporal land use/cover changes. The results show that built-up area and bare land has increased by 2876.13 ha and 149.49 ha, respectively, at the expense of Urban vegetation, wetland and water bodies which decreased by -2908.08 ha, -73.35 ha and -44.19 ha respectively. Findings also indicate that the increase of anthropogenic activities has influenced land use/cover change in the study area. Likewise, population growth, economic development, increase of human activities, government set up, proximity to the CBD and infrastructural development contributes to urban growth of KMC. However, in the simulation model of 2030 results show urban area will increase at the expenses of non-urban area in all directions of the municipality. This study concludes that, LULC change and spontaneous urban growth depleted valuable land resources and scenic environment whereby most of land uses will be overtaken by unstructured settlements; therefore, future LULCC's modeling will be important in supporting the land planning and management process for sustainable growth of the Municipality.