

Urban Change Detection and Pattern Analysis Using Satellite Data

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Abstract : In India, generally people migrate from rural area to the urban area for better infra-structural facilities, high standard of living, good job opportunities and advanced transport/communication availability. In fact, unplanned urban development due to migration of people causes serious damage to the land use, water pollution and available water resources. In the present work, an attempt has been made to use satellite data of different years for urban change detection of Chennai metropolitan city along with pattern analysis to generate future scenario of urban development using buffer zoning in GIS environment. In the analysis, SRTM (30m) elevation data and IRS-1C satellite data for the years 1990, 2000, and 2014, are used. The flow accumulation, aspect, flow direction and slope maps developed using SRTM 30 m data are very useful for finding suitable urban locations for industrial setup and urban settlements. Normalized difference vegetation index (NDVI) and Principal Component Analysis (PCA) have been used in ERDAS imagine software for change detection in land use of Chennai metropolitan city. It has been observed that the urban area has increased exponentially in Chennai metropolitan city with significant decrease in agriculture and barren lands. However, the water bodies located in the study regions are protected and being used as freshwater for drinking purposes. Using buffer zone analysis in GIS environment, it has been observed that the development has taken place in south west direction significantly and will do so in future.

Keywords : urban change, satellite data, the Chennai metropolis, change detection

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