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**Impact of Urbanization on Climatic Conditions: A Comparative Analysis of Delhi and Mumbai Metro Cities Using Geospatial Techniques**

**Keywords:** Urban Climate; Land use/land cover change; Urban heat island; Rainfall trend; Diurnal temperature range

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In this study, the urbanization induced changes in climatic conditions have been analyzed in the Delhi and Mumbai metro cities during 1991-2018 using geospatial techniques. The Landsat datasets have been used to analyze the spatio-temporal pattern of land use/land cover (LULC) change, land surface temperature (LST) and urban heat island (UHI) while station-wise meteorological data taken from India Meteorological Department (IMD) has been used to analyze the trend and pattern of rainfall and air temperature. The K-means and fuzzy-C-means clustering has been used to assess the homogeneous rainfall regions in Delhi and Mumbai. The result showed that both the cities has witnessed very fast transformation of LU/LC pattern and built-up area has doubled in both cities during 1991-2018. This has resulted in significant increase in LST and UHI and degradation of the urban thermal comfort. The analysis of rainfall trend showed

that both cities have witnessed a positive trend in the rainfall, although monotonic trend has been not detected at any meteorological stations. Further, the analysis of air temperature trend showed that the diurnal range of temperature has declined in both Delhi and Mumbai during 1991-2018 and the number of extreme temperature events have increased.