

BUILDING EXTRACTION FROM INDIAN SATELLITE IMAGERY

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The building information is most important and crucial for many of the applications like land use land cover mapping, change detection, urban planning, disaster management and other socio economic activities. The building extraction from satellite images has been important field of research in Remote Sensing and GIS domain. In this study, the potential of Indian Remote Sensing Satellite images for building extraction has been evaluated. The Resourcesat – 2 LISS 3 sensor data during 28th February 2018 were used for this study. LISS 3 data has 24 m spatial resolution and 4 spectral bands namely Green (0.52 - 0.59 μm), Red (0.62 - 0.68 μm), NIR (0.77 - 0.86 μm) and SWIR (1.55 - 1.70 μm). The research location for this study is Kanchipuram district, TamilNadu. It lies between 11° 00' to 12° 00' North latitudes and 77° 28' to 78° 50' East longitudes. The district has a total geographical area of 4,432 km² and coastline of 57 km. The study area falls within 13 tiles of LISS 3 data and all are mosaiced in QGIS. Then the district boundary was downloaded from Bhuvan Portal and the LISS 3 data was extracted to Kanchipuram district. The buildings were extracted using Normalized Difference Building Index (NDBI) in the GIS environment (QGIS 3.14). The NDBI was calculated by the formula. $\text{NDBI} = (\text{SWIR} - \text{NIR}) / (\text{SWIR} + \text{NIR})$. The NDBI values for the mixed built up range were identified and the ranges between -0.021 to -0.082, for vegetation range were identified between -0.360 to -0.498, for water body varies from -0.068 to -0.475 for both vegetation and water body shows high influence of negative values. Where built ups range was greater than zero. The ground truth verifications were carried out with 150 ground points which are randomly identified and verified using Bhuvan portal land use map and the Google earth data. The overall accuracy of the final map was above 92% accuracy with random samples. This study reveals the potentials of Indian Remote Sensing satellite images for building extraction.

Keywords: LISS 3, NDBI, QGIS, SWIR and NIR