

EVALUATION OF SPATIAL IMAGE ENHANCEMENT TECHNIQUES FOR ESTIMATION OF TREE COVER IN URBAN AREA

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ABSTRACT: Tree cover in urban area is of great importance in urban ecosystem. It's play vital roles in enhancing landscape aesthetics, improving water and air quality, providing wildlife habitat, reducing pollution, moderating heat energy, reducing storm, water runoff, and providing other amenities. Hence, urban forest management plays an important role in worldwide. Traditional urban forest management techniques were expensive, generally labour intensive and time consuming. Using of high resolution satellite data and its potentials are new tools for managing and mapping tree/ forest covered area. Remote sensing offered a faster, repeatable, objective, cost effective and efficient way to monitor urban forest dynamics at the landscape level. Quickbird satellite data is quickly becoming the best choice for high-resolution mapping. The present study demonstrates the use of spatially enhanced high resolution Quickbird satellite data for estimation of tree cover in urban area in part of Lucknow city, India. The spatial enhancement of different spatial data sets is often used in digital image processing to improve the visual and analytical quality of the data. The spatial image enhancement technique combines the spectral and high spatial resolution information from two different sensors into one image, which has both spectral and high spatial resolution. In order to improve the spatial resolution, the efficiency of six different spatial enhancement techniques viz. Principal Component, Multiplicative, Modified IHS, HPF, Ehlers Fusion and Brovey Transform with standard deviation 24.53, 20571.15, 46.07, 21.29, 33.50 and 6.84 respectively were examined and evaluated. The Modified IHS spatial enhancement technique with higher standard deviation showing overall best result in compare to others. The Modified IHS spatially enhanced image further used in the urban tree cover estimation. Urban area was masked and extracted the area of interest. The model was developed on the basis of DN value of image those having tree covers and accordingly tree cover was estimated. The urban tree cover is occupies an area of 48.38 ha which is 12% of total geographical area. The information generated in the present study could be used as an important input in the urban forest management programme.