Multi-Temporal Urban Sprawl Monitoring and Land Cover Change Detection Using Remote Sensing and GIS Techniques in Abbottabad, Pakistan

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Abstract

Fast growth of urbanization has become an evident phenomena everywhere in the world as well as entire length of Pakistan due to different attractive pull and push factors of the urban centres which resulting add in the accumulative population as well as urban sprawl in unorganized shape. From the last twenty years, it has been witnessed that Abbottabad has been expanding rapidly due to increased commuters and migration of people from fringe areas. Besides this, the ratio of urban sprawl has been increased manifolded due to increased population of IDPs (Internally Displaced Persons) from North & South Waziristan and Swat regions, quality educational institutions and easy accessible tour resort. Resultantly, urban settlements in Abbottabad increased which brought about a glaring change in agriculture land, vegetation covered areas, water bodies and naked/ barren land. Purpose of this study is to use multi-temporal remote sensing and geographic information system analysis to provide better understanding of land uses and decision making to administrative officials at all tires for coping up various issues of earth resources. To assess change detection of the study area at optimum level for helping the management of urban planning and utilization of natural resources, this research will be executed by procuring Landsat MSS, TM and ETM+ images from 1980 to 2016 from USGS resources. Change detection in land cover by Remote Sensing and GIS techniques will be utilised by specification of a joint multi-temporal classification and maximum likelihood supervised classification with the segment of five to ten years each duration of time using ERDAS IMAGINE-2013 and ArcGIS 10.1. To develop accuracy of results, object based classification will be applied using ENVI-4.8 for segregation of change detection as well. Markov Chain Model will be used for statistical analysis for transition matrix of urbanization movements for future predictions.