SPATIO-TEMPORAL LAND USE/LAND COVER ANALYSIS OF MURREE USING REMOTE SENSING AND GIS

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Abstract
Land use land cover (LULC) patterns are significantly affecting the urban/rural spaces in the encompassing areas. Murree being tourist resort is always under pressure of tourists from all over the country. The population increase in peak season of tourism in summer season and extreme winter, causes a tremendous growth and expansion of urban area of Murree. So a relic of blue pine forest and Chir pine forest is expected to undergo tremendous change and to undergo expansion or degradation depending upon the tourist’s behavior. The present study uses Multi-Temporal Landsat (TM and ETM+ for year 1998, 2003, 2005, 2010) images to detect LULC change in Murree due to the enhanced activities of ecotourism. Change detection of three tourist hotspots of Murree region including Murree Mall, Bhurban and Patriata was evaluated through Maximum Likelihood Classification (MLC) algorithm. The urban expansion has impacted the land use, as it has increased from 57.37% to 69.10%. Result indicates that the Built-up area have increased by 11.73%, reserve forest by 8.11% while grassland and dense natural forest decreases by 7.50 and 12.37 percent respectively. The results provided the better knowledge and understanding of former and current spatial dynamics of LULC change in Murree region along with its ecotourism hotspots.

Keyword: GIS/Remote sensing, land use/land cover, forests of Murree, ecotourism

1. INTRODUCTION
LULC dynamics are two fundamental factors that describe the environmental and economic condition of a country. It is essential for understanding the impact of natural and anthropogenic activities on environment that in turn leads to soil erosion, deforestation and global temperature rise (Dwivedi et al., 2005; Mas et al., 2004; Zhao et al., 2004). Rapid growth of population coupled with industrialization, and unplanned infrastructure developments are altering the LULC patterns at large scale (Shukla et al., 2014) especially in developing countries like Pakistan. Appropriate and precise detection of changes on earth’s surface provides fundamental prerequisites for selection, planning and enactment of land related policies to meet the needs of burgeoning population, to monitor land use dynamics and for the management of natural resources (Rawat and Kumar, 2015). Comparison of two or more multi-source, multi-scale remotely sensed images provide important information for detection of land use/land cover dynamics (Hansen et al., 2012). It is an essential tool for land management practices and meeting sustainable development needs.

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