

Spatial and Temporal Analysis of Forest Cover Change with Special Reference to Anthropogenic Activities in Kullu Valley, North-Western Indian Himalayan Region

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Abstract : Throughout the world, monitoring and estimating the changing pattern of forests across diverse landscapes through remote sensing is instrumental in understanding the interactions of human activities and the ecological environment with the changing climate. Forest change detection using satellite imageries has emerged as an important means to gather information on a regional scale. Kullu valley in Himachal Pradesh, India is situated in a transitional zone between the lesser and the greater Himalayas. Thus, it presents a typical rugged mountainous terrain with moderate to high altitude which varies from 1200 meters to over 6000 meters. Due to changes in agricultural cropping patterns, urbanization, industrialization, hydropower generation, climate change, tourism, and anthropogenic forest fire, it has undergone a tremendous transformation in forest cover in the past three decades. The loss and degradation of forest cover results in soil erosion, loss of biodiversity including damage to wildlife habitats, and degradation of watershed areas, and deterioration of the overall quality of nature and life. The supervised classification of LANDSAT satellite data was performed to assess the changes in forest cover in Kullu valley over the years 2000 to 2020. Normalized Burn Ratio (NBR) was calculated to discriminate between burned and unburned areas of the forest. Our study reveals that in Kullu valley, the increasing number of forest fire incidents specifically, those due to anthropogenic activities has been on a rise, each subsequent year. The main objective of the present study is, therefore, to estimate the change in the forest cover of Kullu valley and to address the various social aspects responsible for the anthropogenic forest fires. Also, to assess its impact on the significant changes in the regional climatic factors, specifically, temperature, humidity, and precipitation over three decades, with the help of satellite imageries and ground data. The main outcome of the paper, we believe, will be helpful for the administration for making a quantitative assessment of the forest cover area changes due to anthropogenic activities and devising long-term measures for creating awareness among the local people of the area.

Keywords : Anthropogenic Activities, Forest Change Detection, Normalized Burn Ratio (NBR), Supervised Classification

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