Monitoring Deforestation Using Remote Sensing And GIS

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Abstract : Forest ecosystem plays very important role in the global carbon cycle. It stores about 80% of all above ground and 40% of all below ground terrestrial organic carbon. There is much interest in the extent of tropical forests and their rates of deforestation for two reasons: greenhouse gas contributions and the impact of profoundly negative biodiversity. Deforestation has many ecological, social and economic consequences, one of which is the loss of biological diversity. The rapid deployment of remote sensing (RS) satellites and development of RS analysis techniques in the past three decades have provided a reliable, effective, and practical way to characterize terrestrial ecosystem properties. Global estimates of tropical deforestation vary widely and range from 50,000 to 170,000km2 /yr Recent FAO tropical deforestation estimates for 1990–1995 cite 116,756km2 / yr globally. Remote Sensing can prove to be a very useful tool in monitoring of forests and associated deforestation to a sufficient level of accuracy without the need of physically surveying the forest areas as many of them are physically inaccessible. The methodology for the assessment of forest cover using digital image processing (ERDAS) has been followed. The satellite data for the study was procured from Indian institute of remote Sensing (IIRS), Dehradoon in the digital format. While procuring the satellite data, care was taken to ensure that the data was cloud free and did not belong to dry and leafless season. The Normalized Difference Vegetation Index (NDVI) has been used as a numerical indicator of the reduction in ground biomass. NDVI = (near I.R - Red)/ (near I.R + Red). After calculating the NDVI variations and associated mean, we have analysed the change in ground biomass. Through this paper, we have tried to indicate the rate of deforestation over a given period of time by comparing the forest cover at different time intervals. With the help of remote sensing and GIS techniques, it is clearly shown that the total forest cover is continuously degrading and transforming into various land use/land cover category.

Keywords : remote sensing, deforestation, supervised classification, NDVI, change detection

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