Analysis of spatial and temporal changes of forest cover in the Mount Pulag National Park, Philippines

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Abstract

Mount Pulag National Park lies in the Grand Cordillera Central in the northern part of the Philippines at 16o 30' 36" N and 120o 50'20" E covering an approximate area of 11,550 hectares. It is considered to be the last frontier of the Philippine Mossy Forest. During the past decade, a considerable amount of forest cover had been lost leading to some negative impacts such as loss of biodiversity and soil erosion. Mitigating the impacts entails the generation of relevant data and information on current land management and spatial-temporal land use changes.

The study aims to quantify the spatial and temporal changes of forest cover in the Mount Pulag National Park from 1988 to 1998, and to identify the different variables such as road networks, drainage networks, residential houses, aspect, slope, and elevation associated with these changes. The study used several maps such as topographic maps, land use and forest type maps and two Landsat Thematic Mapper images taken on January 31, 1988 and January 10, 1998 respectively. The data were processed using image processing and Geographic Information System. Post-classification scheme was done based from the supervised maximum likelihood classification to map out forest cover changes. Thematic maps resulting from the single time classification were compared with each other quantitatively. Land cover classes were lumped into forest and non- forest categories (binary format). Buffer distances were created and overlaid to the deforested area map to investigate the degree of relationship to deforestation by using distance from road, household, and river channel as indices. Landscape attributes such as slope, elevation, and aspect were also used to investigate the degree of relationship to deforested area. During the period of ten years, about 652 hectares were changed from forest to non- forest area. Regression analysis was employed to determine the amount or degree of deforested area in relation to distance from the road, the distance from household, and the distance from river channel. Results showed that there was a high significant degree of relationship between distance from road, household, and river channel to the amount of area deforested. Most of the deforested areas were concentrated from 0-40% slope, within 1700 - 2200 m above sea level and to the west to southern aspects.