



Thesis Abstract

Landscape Dynamics and Hydrologic Changes in Mananga Watershed, Cebu, Philippines

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The change in landscape structure and its influence on the hydrology of Mananga Watershed in Cebu Province were assessed. Land use maps in 1956, 1985, and 1995 together with topographic and other thematic maps were used to identify and delineate the common landscape elements. ArcView 3.2 was used to analyze changes in patch size, number and density and in landscape pattern with respect to soil type and slope of the watershed. The temporal change in runoff coefficient and soil erosion potential was determined. Actual runoff coefficient was compared with estimated runoff coefficient using Soil Conservation Service Curve Number for estimated runoff. Soil infiltration rate was determined for different land uses and soil types. The influence of change in population of the watershed was also assessed.

The watershed landscape consists of a matrix of annual cropland; patches of tree plantation, brushland, grassland, and perennial cropland; and river and road corridors. The area for annual cropland has decreased continuously throughout the study period (1956-1995) while tree plantation's area has increased throughout this period. This contributed to the downward trend in runoff coefficient. The proclamation of the watershed as protected area and reforestation activities improve watershed hydrology.