LCLUC Abstract

Agricultural Colonization in the Ecuadorian Amazon: Population, Biophysical, and Geographical Factors Affecting Land Use/Land Cover Change and Landscape Structure

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This project will examine the human and biophysical dimensions of land use and land cover change (LULCC) in the Ecuadorian Amazon associated with spontaneous agricultural colonization. A satellite time-series from the 1970s through 1998, combined with GIS thematic coverages of biophysical gradients and geographical accessibility, will be linked to a scientific population sample of georeferenced farm household data on LULC and socio-economic characteristics for 1990 and 1998. Image processing for LULC characterization and spatial analyses of landscape structure will be used to assess the rate and nature of LULCC and to model the effects of LULC, secondary plant succession, and land fragmentation on carbon budgets and assimilation rates for specific landscape strata and study area locations. Statistical models will be used to estimate the demographic, socio-economic, biophysical, and geographical determinants of farm and community-level LULCC. The degree of agricultural extensification and intensification and rates of deforestation will be documented at three spatial scales: the farm household, the sector or community, and the region. The proposed research combines social science survey methods with environmental modeling and landscape ecology in a GIS and remote sensing analytical framework to increase understanding of LULC dynamics and the forces influencing deforestation. The study site in northeastern Ecuador, a region of high biological diversity, lies at the headwaters of the Amazon and adjoins major protected areas, even as it is threatened by land use activities of spontaneous settlers. The western Amazonia study site thus offers a valuable contrast to sites in eastern Amazonia.