

PATTERNS OF TREE DIVERSITY IN RELATION TO DISTURBANCE REGIMES IN A TROPICAL SECONDARY LOWLAND RAINFOREST IN KAHAWATTA, RATHNAPURA DISTRICT, SRI LANKA

A. A. D. Sandamali¹, D. I. D. S. Benaragama¹, R.A.A.S. Rathnayake² and N. Geekiyanage¹

¹*Department of Plant Sciences, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

²*Department of Agricultural Engineering and Soil Science, Faculty of Agriculture, Rajarata University of Sri Lanka, Anuradhapura, Sri Lanka.*

Degraded secondary forests are highly heterogeneous in terms of existing vegetation and resource availability. Comparative analysis of this heterogeneity makes it easier to apply standard sets of restoration strategies across various spatial scales. We studied the patterns of tree diversity in relation to successional stages and disturbance regimes in a tropical secondary lowland rainforest, Kahawatta, Rathnapura District, Sri Lanka. Thirty-one plots (20×20 m) representing five land use categories: productive tea lands (n = 5), marginal tea lands (n = 5), scrub (n = 5), and two blocks of woodlands (n = 10 and n = 6), were laid. The latter three categories were abandoned tea fields at different times. All trees with diameter at breast height (dbh) greater than 1 cm within each plot were counted, identified, and their dbh values were recorded. At plot level, ground cover of *Lantana camara* L., slope, altitude, and distances from neighboring main road, nearest human settlements, and nearest natural forest were recorded. Using published allometric equations for tropical trees, Above Ground Biomass (AGB) were computed. Using georeferenced images, a map of the spatial distribution of canopy cover was produced. A total of 1,302 trees belonging to 60 species and 33 families were found. *Symplocos cochinchinensis* (Lour.) S. Moore. was the most abundant. Non-tea land use categories were similar in terms of tree diversity ($p=0.58$), but tea lands and the scrub had low AGB in contrast to the woodlands ($p<0.0001$), as expected. Moreover, the sites close to a natural forest reserve showed high species richness ($p=0.0001$). These results facilitate the matching of ecological requirements of species with the site quality for ecological restoration of abandoned tea fields.

Keywords: GIS mapping, Land use change, Restoration, Secondary forest succession