# SOIL PHYSICAL AND CHEMICAL PROPER TIES OF REST ORED CHENA LANDS IN A TROPICAL DR Y FOREST

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Tropical Dry Forests (TDF) are the most threatened forest type in tropics and in Sri Lanka. TDF's are the most extensive physiographic feature, which accounts 54% of the islands' natural forests and 16% of the total land extent of the country. Agricultural conversion and expansion of human settlements are the most influential threats to TDF's in Asia and Sri Lanka. Hence, TDF's necessitate a high priority in conservation and restoration. However, restoration pathways for TDF's have been poorly studied and established. Three sites of the Dambulla Forest Arboretum with different disturbance histories have been restored using assisted natural regeneration and subsequent abandonment from shifting cultivation *(chena).* The objective was to model the soil physical and chemical characteristics of treated sites *i.e.* assisted natural regeneration (ANR), woodland (WD) and abandoned *chena* land (AC). Soil samples were collected from five plots per treated site and from two depths (0-20cm and 20-40cm) using stratified random sampling. The plot size was 3030m. Total Nitrogen (TN), Total Organic Carbon (TOC), Electrical Conductivity (EC), Soil pH, Available Phosphorus, Cation Exchange Capacity (CEC), Soil moisture and texture were estimated using standard laboratory methods. Results revealed that the soil moisture ($p$<0.0093), CEC ($p$<0.0001) and total organic carbon ($p$<0.0001) were significantly different with forest patches and depth, and other characteristics were not. Highest TOC, EC and moisture was recorded in the upper soil layer of ANR,

which was 1.4%, 27.73 μScm$^{-1}$and 19.32%. Respectively, the lowest TOC percentage was observed in the AC deep soil layer (0.33 %). Highest pH and TN was observed in WL (6.02 and 0.11%). Results imply that ANR is a better restoration pathway for enriching TOC over subsequent abandonment from shifting cultivation and would be an appropriate mitigation strategy for global warming under REDD+ (Reducing Emissions from Deforestation and Forest Degradation in Developing Countries).

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