

## Carbon Sequestration in Plants of Reforestations in Tank Cascades of the Dry Zone of Sri Lanka

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### ABSTRACT

Reforestation can be used to mitigate global warming since trees absorb carbon dioxide through their photosynthesis cycle promoting a green environment, and deforestation can be discouraged. Tank cascade reforestation programs are beneficial to cascade communities in the dry zone but due to limited studies on small tank systems of Sri Lanka, little is known on carbon sequestration on tropical tree species as compared to that in temperate areas. Therefore, under a reforestation program, *Plan Sri Lanka* planted a total of 97,986 plants of different species between 2005 and 2009 Maha seasons in selected tank cascades of Mahawilachchiya, Medawachchiya and Nuwaragam-Palatha-divisions of Anuradhapura District in the dry zone in order to assess the carbon sequestration of planted trees. However, only 46,090 plants in *kattakaduwa*, catchment areas of the tanks, and home gardens survived at the time of this survey.

During the study, green and dry weight of a tree was used to calculate the weight of carbon acquired by the tree per year through the carbon sequestration process. The average carbon sequestration rate depends on many factors, such as diameter of the trunk, height and weight of the tree and the age, growth characteristics of tree species, the conditions of growth at the tree site, and the density of the tree's wood. For example, a coconut tree planted in 2005 sequestered ~ 138kg/carbon/per year compared to ~ 3.88kg by a mango tree of same age. Based on tree counting in randomly selected plots, survival rate of the plants was ~ 98% in home gardens, whereas in catchments and *kattakaduwa* the maximum was 34%. Most plants in *kattakaduwa* have rotted during long periods of inundation. Cattle and goats have damaged the plantation and adversely affected the forest plants in some areas and reservations. Despite these setbacks *Plan Sri Lanka* has continued its activities to identify critical regions, promote use of alternative timber species, ensure conservation of natural forests, and banned clearing of natural forests for commercial purposes aiming at more rewards from the carbon sequestration process advantageous to the farming community.

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