PREDICTION OF THE VARIATION OF ABOVE GROUND BIOMASS AND CARBON CONTENT OF COCONUT TREES WITH AGE

P.S.S. Nanayakkara[1]*, S.M.C.U.P. Subasinghe[1] and V.R.S. Peiris[2]

[1]Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Sri Lanka

[2]National Cleaner Production Centre, Nugegoda, Sri Lanka
*nanayakkara.pss@gmail.com

Coconut (*Cocos nucifera*) is a monocotyledonous plant belongs to family Arecaceae. It is grown on about 11.8 million ha of lands in more than 92 countries. Coconut plantations occupy over 6% of the total land area of Sri Lanka and significantly contributes to the national economy of the country. Due to the recent trends in carbon trade, coconut plantations in Sri Lanka have a high potential to enter to the carbon market.

Therefore this study attempted to build mathematical models to identify the above ground variation of biomass and Carbon contents in Coconut trees with the age.
In order for data collection, 23 plantations of age classes varying from 5 to 50 were selected from the Kurunegala district of low country intermediate zone. 20 coconut trees were selected from each plantation and diameter and height were measured. Number of fronds was counted. Frond and stem samples were collected from the plantations and saw mills respectively for estimation of biomass and carbon. Frond biomass was estimated by weight-weight method and that of stem was estimated by volume-weight method. Samples were oven dried at 105° C for until a constant weight was obtained and the carbon content was estimated by Walkley-Black method. According to the results, diameter and height of coconut trees vary from 23.7cm to 29.5cm and 1.1m to 16.36m from 5 to 50 years respectively. Tree biomass and carbon vary from 77.326 kg to 333.159 kg and 57.797 kg to 252.985 kg respectively for the same time period. Both biomass and carbon were modelled keeping age and height as explanatory variables.

The resultant models are given below and the r^2 values were 96.8 for both of models.
Tree Biomass = 53.9 - 3.03 Age + 27.3 H
Tree Carbon = C = 39.5 - 2.28 Age + 20.7 H