rubber. Specifically, this paper is focused to assess the overall productivity of rubber with respect to latex yield.

The experiment was set up in Rathnapura district of Sri Lanka in 1992. Rubber was planted in three high densities, i.e., 600, 700, 800 trees per hectare, with the presently recommended level of 500 trees per hectare. Also, 3 genotypes (clones) i.e., RRIC 100, RRIC 110 and RRIC 121 were incorporated with the statistical design of split plot where the planting densities were laid as the main plots whilst clones were in the sub plots. Growth and yield parameters in terms of girth, bark thickness (BT), and the incidences of tapping panel dryness (TPD) were assessed yearly and the latex volume (LV), % dry rubber content (DRC), number of trees in tapping (TIT) were assessed on daily basis up to 2004.

Irrespective of the clone used, mean yield per tree per tapping decreased with increase in planting density. However, it was *vice versa* in the case of yield per hectare (YPH) due to the increase in TIT with increase in planting density. The percentage of trees with TPD was not significantly affected by the planting density. The clone RRIC 110 was infected with Corynespora leaf disease hence poor performance was shown in all densities. The trend of increasing YPH was similar in both other clones, i.e. RRIC 100 and RRIC 121. However, the rate of increase in TIT showed a decline of 700 trees per hectare resulting in a lower YPH at this level than expected. Although latex productivity could generally be increased with increase in planting density, overall economic profitability of the system will also depend on cost of production, amount and value of timber and carbon produced. Therefore, study warrants further investigations on above issues before making any changes to the presently recommended planting density.

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Assessment on timber and carbon in rubber plantations with special reference to the wet zone of Sri Lanka

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Rubber (*Hevea brasilensis*) has traditionally been cultivated for the latex extraction; however, its importance in other uses, particularly producing quality timber and sequestering atmospheric carbon as a permanent sink, is also often highlighted. The amount of timber produced and carbon sequestered in rubber trees has been assessed in isolations. Those values would differ under different growth conditions and to date, no simple protocol is available to quantify the amount of timber and carbon in rubber plantations. Therefore, the study reported here was aimed to develop simple growth models to assess the timber production and carbon fixing capability of rubber plantations in Sri Lanka.

Initially, a growth function was developed to assess the girth development with respect to age and thereafter another three functions to quantify the amount of timber, biomass and carbon in the rubber tree based on girth diameter. Also, wood density variation with age of the tree was modeled to determine the biomass in timber under different age categories. The assessment on the available carbon was based on the carbon content in unit biomass and the total amount of biomass in the tree. Growth data required for the girth development function were gathered from secondary sources and girth measurements made on existing rubber clearings. Destructive sampling was conducted to assess the timber, biomass and wood density.

Based on above models, an average rubber tree at 30 years achieves a girth of 88.64 cm and produces 0.656 m^3 of timber and 594.46 kg of biomass. The amount of atmospheric carbon fixed in timber at this age was estimated as 193.7 kg per tree and 45.86 MT per hectare. However, total amount of organic carbon fixed in above ground components was 220.8 kg per tree and 52.27 MT per hectare. The models of this study were developed under general conditions in the wet zone, hence should be validated for drier regions of the country before any wide scale adoption.