

## **Estimation of Carbon sequestration ability of a selected Mangrove tree “*Sonneratia caseolaris*”**

**K.G.P.B. Karunaratne\* and S.P. Nissanka**

*Post Graduate Institute of Agriculture, University of Peradeniya, Sri Lanka*

**Key words: mangroves, Carbon sequestration, tree volume**

### **Abstract**

Mangrove ecosystems found in muddy shores in bays and estuaries in Sri Lanka are rich in biological diversity. Because of shrimp farming, house constructions and other land uses, mangrove habitats are severely destroyed. Mangrove forests provide forest products including timber, fuel wood and non-wood forest products including food and medicine.

Mangroves in developing countries are used as small forests for Carbon trading with developed countries. It conserves the environment and helps to sequester atmospheric Carbon, help in reducing atmospheric Carbon while mitigating global warming and climate change.

Developing Carbon trading projects through reforestation/aforestation, identification of high potential Carbon sequestering species and ways to estimate Carbon stocking is very much needed.

*Sonneratia caseolaris* is identified as a mangrove tree that has multiple roles. Also it has high potential to create small forests in abundant paddy lands that are uncultivated due to saline condition in coastal areas.

In this study, different aged trees were selected in natural habitat of Ittapana area, near Bentota River in Kalutara district in Sri Lanka. Sampling units were chosen randomly. The total height and diameter at breast height (dbh) were measured in selected trees of each age category. Soil pH, EC and organic matter contents were also measured at different depths of selected soil profiles. Relationships were developed to estimate tree height and volume. At first, a relationship between height and diameter was developed to estimate the height by using dbh. Parabolic model was found to be the best model with a high  $R^2$  value of 0.96. In the Second step, a linear relationship between volume and basal area was developed to predict the tree volume by measuring the diameter of tree (basal area) and it showed higher  $R^2$  value 0.97.

The 15 years old *Sonneratia caseolaris* stand showed an average volume of 1.004 m<sup>3</sup>/plant (1600 plants/ha) and this stand will approximately 160.61 metric tones of Carbon per hectare. Soil pH was closer to neutral (6.19) on top soil but it decreased to 3.05 acidic levels with the depth. EC was also low in top soil 0.917ms/cm compare to bottom soil 4.27 ms/cm, because of high salt content.

*Correspondence :* pathmasirik@hotmail.com