PROJECT FILE

Title: Assessment on carbon pool potential of important tree species at different sites, ages, and management regimes

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Start and Completion Dates: July 2006 – March 2011

Objectives:

- To assess carbon pools in plantations of Teak, Eucalyptus, Casuarinas and Acacias in different site conditions.
- To quantify carbon pools at different ages of the plantations.
- To assess carbon pool potential of important agroforestry systems.
- To evaluate carbon pool potential of various management regimes in plantations.

Funding Agency: ICFRE

Total Budget: Rs. 4.22 lakhs

SUMMARY

The present study aims to assess carbon pools in plantations of Teak, Eucalyptus, Casuarinas and Acacias in different site conditions. A reconnaissance survey was carried out in all the districts of Tamil Nadu for selection of plantations for carbon sequestration studies. The basis for selection of plantation was that the selected number of plantations will well represent various agro-climatic regions of Tamil Nadu as well as various predominant soil types of each zone. The sampling of plantations also covered different management practices mainly the irrigated as well as rainfed conditions. In the selected plantations, sample plots were laid out and girth of all the trees in the sample plots were measured. The entire range of girth was stratified into three girth classes. The mean trees in each girth class was felled for biomass and carbon pool estimation.

With regard to Casuarina plantations, a total of 200 trees were felled from 69 casuarina plantations in three agroclimatic zones (North Eastern zone, Cauvery Delta zone and Southern zone) in Tamil Nadu under different soil types viz., Inceptisol, Alfisol and vertisol and under irrigated and rain-fed conditions. The results on carbon stock in foru carbon pools *viz.* i) aboev-ground biomass, ii) below-ground biomass, iii) litter and Soil Organic Carbon revealed that North Eastern zone recorded maximum carbon stock of 51.75 MT C ha^{-1} followed by Cauvery Delta zone recorded 44.63 MT C ha^{-1}. Among three soil types studied, Alfisol registered more carbon stock of 56.36 MT C ha^{-1} and Inceptisol registered lowest carbon stock of 42.96 MT C ha^{-1}. Similarly, 243 Eucalyptus trees were sampled from 81 plantations in Tamil Nadu for biomass estimation and in turn carbon stock estimation in biomass components. In all these 82

eucalyptus plantations, soil samples were collected and analyzed for carbon content and estimated soil carbon stock in these plantations. Carbon stored in the biomass alone amounted to 47 MT C ha^{-1} in the clonal plantations of eucalyptus. With reference to *Acacia mangium*, biomass studies conducted in 7 plantations and in turn carbon stock estimation in biomass components was worked out. The mean carbon stcok in these plantations was 6.0 MT C ha^{-1} in biomass alone at the half rotation age of 3 years.

A book titled 'Regional Yield Table and Carbon Table for Plantations of *Casuarina equisetifolia* in Farmlands of Tamil Nadu' has been released based on the results of the present studies. This publication will meet the need of the growers of Casuarina plantation by providing them ready reckoner tables for assessing yield of the plantation.