

Comparative Study of Floristic Diversity and Tree Carbon Stock in Dense and Sparse Forest of the Natural Reserve and Mixed Forest Plantation in Mullaitivu District, Sri Lanka

Anuraj Alagarajah., Jeyavanan Karthigesu and Sivamathy Sivachandiran

Department of Agronomy, Faculty of Agriculture, University of Jaffna

The study was carried out in Mullaitivu district in a tropical dry forest of northern Sri Lanka. The

object of the study is to compare the species diversity of flora and quantify the tree carbon stock in dense and sparse forest of natural reserve and mixed forest plantation in the district. A total of 12, 14 and 15 square sampling plots (each 20 m × 20 m) were laid in dense, sparse and mixed forest plantations, respectively, in eleven locations in the district. Shannon Wiener index (SWI) and Important Value Index (IVI) were calculated for diversity assessment. The tree (≥ 5 cm in diameter) was selected to assess the carbon stock using a tropical allometric equation. A total of 26 species in 17 families were recorded. The common species in all sites were *Chloroxylon swietenia* DC., *Manilkara hexandra* (Roxb.) Dubard., *Memecylon umbellatum* Burm.f., *Alseodaphne semicarpifolia* Nees, *Berrya cordifolia* (Willd.) Burret, *Pterospermum suberifolium* (L.) Willd. and *Cassia fistula* L.. Mean value of the SWI in mixed, sparse and dense forest for trees were 0.89, 1.56 & 1.71 and for saplings 1.18, 1.27 & 1.48 and for seedlings 1.18, 1.14 & 1.29, respectively and this results shown that comparatively diversity of trees, saplings and seedlings were high in dense forest compared to the sparse forest followed by mixed plantation. Based on the IVI, the dominant species in mixed forest plantation was *Tectona grandis* L.f. (111.34 %) followed by *Eucalyptus globulus* Labill. (49.91 %) and in dense and sparse forest were *M. hexandra* (51.19 %, 80.07 %) followed by *Vitex altissima* milla(s) (44.13 %). The natural forest species of *M. hexandra*, *P. suberifolium*, and *M. umbellatum* were found in mixed plantation forest. Mean carbon stock of dense, sparse and mixed forest plantation was 146.13 ± 23.87 , 138.77 ± 22.04 and 27.35 ± 5.83 Mg ha⁻¹, respectively and this result revealed that tree carbon stock was high in the dense forest.

Email: aanuraj92@gmail.com