

Chanita Thongfak 2012: Biomass and Carbon Storage of Teak (*Tectona grandis* Linn.f) at Thongphaphum Plantation, Kanchanaburi Province. Master of Science (Silviculture Technology), Major Field: Silviculture Technology, Department of Silviculture. Thesis Advisor: Assistant Professor Sapit Diloksumpun, Ph.D. 85 pages.

The objective of this study was to determine the biomass and carbon storage in the biomass as well as the relationship between various parameters and the biomass of teak planted at Thongphaphum plantation, Kanchanaburi province. The sampling plots were established in 12 age classes, 4-31 years of ages, two 60 m × 60 m plots each. In each plot, the total tree height and diameter at 1.30 m (DBH) of all trees were measured. The biomass of each tree part was estimated using the allometric equations and carbon storage in the biomass was also estimated accordingly. In addition, the relationship between total biomass and total basal area as well as leaf area index was also undertaken using regression analysis.

The result indicated that the total height, DBH, biomass of each tree part, stem volume and carbon storage in the biomass as well as mean annual increment (MAI) of the biomass and carbon storage in the biomass were significantly different among age classes ($p < 0.01$). The MAI of total biomass and carbon storage in the total biomass was 0.47 – 7.22 and 0.21 – 3.55 t/ha/yr, respectively. The total biomass and carbon stored in the biomass tended to increase with age but considerably low biomass and the carbon storage was also observed in a few age classes due to the thinning schedule and/or the site quality. In 2009, the Thongphaphum plantation, with the area of teak plantation of 2,213.89 ha, provided the total biomass of 133,642.90 t and the tree carbon stock of 66,219.56 t, thereby serving as one of major forest carbon pools in Thailand. The regression analysis also indicated significant correlation, in the form of power function, between the total biomass/carbon storage and total basal area and leaf area index. The findings suggested that total basal area and/or leaf area index could be potentially applied together with remote sensing technique for large scale assessments of teak carbon stock.

Student's signature

Thesis Advisor's signature