
**Simulation of Carbon Dynamics of *Acacia mangium* Forest
at Parungpanjang, Bogor, West Java, Indonesia
Using Century Model**

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Abstract

Forest ecosystems play an important role in regulating atmospheric carbon through the photosynthesis process. Many studies have measured the carbon stocks of *Acacia mangium* but those studies only captured a static view without taking into account the role of other components of the ecosystem. Century is one of ecological models that can be used to simulate carbon dynamics and the effects of other components in ecosystems. This research has simulated the carbon dynamics of *Acacia mangium* in Parungpanjang, Bogor using Century model. The research stages included model parameterization, validation, and analysis of the pattern of carbon accumulation in an *Acacia mangium* stand grown in a reforestation setting. The parameterization was done by adjusting the model parameters to the characteristics of *Acacia mangium* and the environment condition of the study area. The validation was conducted by comparing the simulation results to empirical data from the field measurements of carbon stocks in *Acacia mangium* stands of 2nd, 4th, 6th, and 8th years old. The validation process demonstrated that the output of simulation approaches the empirical data. Pattern of the simulated dynamics in 50 years shows that the carbon accumulated in the forest system, *Acacia mangium* biomass, and necromass increase as the age of stand increases. However, the accumulation of soil carbon initially decreases until it reaches a relatively constant value.

Key Words: *Acacia mangium*, Century, Carbon Dynamics