ROLE OF SECONDARY GROWTH FOREST IN CO_2 ABSORPTION IN EASTERN AMAZONIA[*]

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ABSTRACT

Land use and land cover change has a major impact on the global carbon cycle and consequently on climate change, especially when it involves forest conversion into agricultural use or abandonment after cultivation. Biomass burning and decomposition release CO_2 to the atmosphere and forest regrowth absorbs CO_2 through photosynthesis. The total amount of carbon absorbed by secondary growth forest is currently unknown. This paper presents inedited data on biomass estimation from two sites of secondary growth forests located nearby Marabá, Pará State, (Eastern Amazônia), based on a combination of forest inventories, allometric equations and destructive biomass sampling. In addition, top soil root biomass and leaf area index (LAI) of the two classes (5 years and 9 years old) of secondary growth forests were estimated. Sampling sites were located using Landsat TM imagery. The 5 years old secondary growth forest was dominated by *Cecropia spp.* (57%), *Aparisthmium cordatum* (11%), and *Inga* spp.(6%). It had a basal area estimated in 17.1 m^2/ha and a total above ground biomass of 77.0 Mg/ha (dry weight) with a carbon accumulation rate of ~7.5 Mg/ha/year. The average LAI was 4.51. The 9 years old secondary growth forest was dominated by *Cecropia* spp. (35%), *Siparauna guianensis* (7%), and *Pourouma* spp. (6%). It had a basal area estimated in 21.7 m^2/ha and a total above ground biomass of 112.0 Mg/ha, with a carbon accumulation rate of ~6 Mg/ha/year. The average LAI was 4.81. The multitemporal satellite data was essential to accurately determine the age and former use of the selected sites. This analysis revealed that the two selected sites represents the highest rates of carbon fixation due to regrowth, because both sites were cut, burned once and abandoned. The 1993 land use map of the studied region obtained from this experiment indicates that 68 % of the area was primary forest , 7 % was secondary growth forest, 24 % was pasture and 1 % is water and constructions. Therefore, from the total area deforested about 23 % was abandoned and was covered by secondary growth forest. In addition to biomass estimation, 28 trees were cut, separated in components, such as leaf, branches, and bole, weighted, and dried up to constant weight. This allowed the verification of the adequacy of the available allometric equations.