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ABOVEGROUND BIOMASS AND CARBON STOCKS IN THE CERRADO FORESTS, MATO GROSSO, BRAZIL

OBERIRDISCHE BIOMASSE UND KOHLENSTOFFVORRÄTE IN DEN CERRADO WÄLDERN, MATO GROSSO, BRASILIEN

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SUMMARY

The Cerrado biome represents around 25 % of the land surface of Brazil comprising a high biodiversity and a great proportion of endemic species. The vegetation is characterized by a mosaic of grasslands, savannas and forests. Since the 1970s, the biome is strongly affected by deforestation and degradation along with fragmentation. Within the arc of deforestation four fragments in the *Cerradão* and two fragments in the *Cerrado denso* (*sensu stricto*) were selected to analyze the aboveground biomass (AGB) and carbon stocks in the municipality of Nova Mutum, Mato Grosso, Brazil. To apply appropriate allometric models for AGB estimation and to verify the hypothesis that there exists a gradient of AGB from the border to the center of the fragments, plot analysis along transects (border to center) were launched. For the estimation, the woody components of the tree layer and of the shrub layer were investigated by recording main variables like the diameter at breast height (DBH), the total tree/shrub height, wood density, basal area and the tree species. Finally, the DBH and the total tree/shrub height were the explanatory variables of the allometric model for the *Cerradão* whereas the DBH and the wood density were the explanatory variables of the allometric model for the *Cerrado denso*. The estimated tree and shrub AGB of the *Cerradão* amounted to 93.23 Mg ha^{-1} with carbon stocks of 46.61 Mg ha^{-1}. The *Cerrado denso* revealed a total AGB of 56.13 Mg ha^{-1} and aboveground carbon stocks of 28.07 Mg ha^{-1}. These values are higher compared to similar studies in the Cerrado biome. Moreover, the results showed no significant differences in the quantity and distribution of AGB and aboveground carbon stocks between border and center of the fragments in both vegetation types but a significant difference of the AGB and aboveground carbon stocks between the two investigated vegetation types. Extrapolations of the AGB and carbon stock results mention that for the *Cerradão* in Mato Grosso total AGB is 0.29 Gt and the AGB for the *Cerrado denso* is 0.41 Gt. in Mato Grosso. The preservation of the still existing forest areas is not only important for the C-cycle, but also for the regional water cycle and biodiversity.

Keywords: Aboveground biomass and C-stocks, Cerrado Biome, fragmentation, allometric models, Mato Grosso, Brazil

sensu stricto denso (Eta 1268 ± 313 mm yr^{-1}) will decrease by 500-550 mm yr^{-1}. Finally, the AGB and the carbon storage capacity are crucial for the regional water and carbon cycle as well as for global energy and water fluxes.

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