**PP–12: Carbon dynamics in cacao agroforestry plantations setup after forest or savannah: a chronosequence analysis in a forest-savannah transition zone in Cameroon**

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**Abstract:**

Previous studies in the forest - savannah transition zone of Bokito in Central Cameroon have shown that smallholder farmers were able to realize afforestation by creating cacao plantations on savannah land. Compared to plantations setup after forest in the same region, cocoa production levels and associated tree species densities were found to be comparable on the long term. In the light of climate change, afforestation of savannah with cacao agroforestry plantations could be of great potential due to its significant storage of carbon. Cocoa agroforestry plantations with an age gradient of 0 to 80 years were selected to assess aboveground carbon accumulation in cacao and associated trees as well as the dynamics of soil carbon concentration. The two previous land use types: savannah and gallery forest were also included in the analysis for comparison. Total aboveground carbon (AGC) was found to be highest in the gallery forest control plots (118 Mg ha-1) and lowest in the savannah control plots (trees and herbs: 8 Mg ha-1). Compared to the previous land uses, mean total AGC was around 40% lower in cacao plantations set-up after forest while AGC stocks of plantations set up after savannah have increased by 630%. AGC of cocoa plantations after forest stayed relatively stable over time while it increased significantly (p < 0.01) with the age of the plantations setup after savannah. According to the soil texture, different tendencies of soil C concentration increase over time were found in cocoa plantations setup after savannah, while no change in soil C concentration was observed after forest over time. Overall, we found carbon accumulation in cocoa plantations set up after savannah and carbon depletion in plantations set up after gallery-forests.

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