Determination of CO_2 emissions from agricultural soils under different land management practices using a dynamic steady state chamber-based approach

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The global soil carbon pool is several times the size of the atmospheric pool and biotic pool combined and is therefore expected to play a key role in the cycling of carbon. However, conversion of land use/cover leads to changes in soil properties and biogeochemical cycling, with implications for carbon, nitrogen and trace gas fluxes. Given the amount of organic carbon in soils, understanding the feedback between soil organic matter decomposition and climate change is critical to the development and evaluation of greenhouse mitigation strategies based on modulation of landscape management practices that encourage carbon stabilization in soils.

Here, we attempt to provide a comprehensive overview of the effects of different landscape architecture (*Artocarpus altilis* orchard, *Colocasia esculenta* and *Saccharum officinarum* plots, and *Cynodon* spp. small ruminant pasture) on the seasonal dynamics of CO_2 fluxes at the local scale, using a dynamic steady state chamber-based approach. In addition, soil samples were taken at each land use area for related biogeochemical determinations.

Preliminary results indicate that the mean soil-atmospheric CO_2 flux ranged from 13.8 x 10^6 g CO_2 ha^{-1} day^{-1} to 14.9 x 10^6 g CO_2 ha^{-1} day^{-1}, and the contribution of soil respiration to this flux determined using Keeling plot analysis. Soils pH (5.11–7.34) and organic matter content varied widely (16.3%–23.64%), and are typical of highly weathered mineral soils in tropical environments. Further work is underway to determine the carbon and nitrogen contents, active carbon pool, microbial biomass carbon and molecular characteristics of the soil organic matter.