



Greenhouse gas fluxes from smallholder farms in sub-Saharan Africa

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Few field studies examine greenhouse gas (GHG) emissions from African agricultural systems, resulting in high uncertainty for national GHG inventories. This lack of data is particularly noticeable in smallholder farms in sub-Saharan Africa, where low inputs and minimal management are common. We examined the GHG emissions from soils and manure for typical, Kenyan smallholder farms for the duration of one year. Cumulative annual fluxes were low, ranging from -6.0 to 2.4 kg CH₄-C ha⁻¹ and -0.1 to 1.8 kg N₂O-N ha⁻¹. Management intensity of the plots did not result in differences in annual GHG fluxes measured, likely because of the low fertilizer input rates (< 20 kg N ha⁻¹yr⁻¹). Furthermore, mean CH₄ and N₂O emissions from manure from two breeds of cattle deposited on rangelands during the dry season were also low, ranging from 95 – 302 mg CH₄-C kg DM⁻¹ and 8.3 – 11.5 mg N₂O-N kg DM⁻¹. These rates would correspond to emission factors of between 87 and 246 g CH₄-C head⁻¹ year⁻¹ and 0.1 – 0.2% of applied N, which were lower than IPCC emission factors; (from 13 to 40% and 10 to 20% of IPCC emission factors for CH₄ and N₂O respectively).