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Does Organic Fertilisation in the Colombian Climate Smart Village Support the Transition Towards Climate Smartness?

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Abstract

The Climate Smart Villages (CSV) represent an agriculture research-for-development approach that enables dialogue between communities of farmers, scientists, extensionists and decision-makers towards co-learning and co-developing context-specific options that support short and long-term adaptation to climate change while reducing impacts on the environment (e.g. GHG emissions) and increasing productivity (i.e., addressing all three pillars of Climate Smart Agriculture). In Colombia, 14 communities in the northwest of Popayán, the capital city of Cauca Department, started a CSV in 2014. In this CSV, farmers are growing coffee and sugarcane on small areas (< 5 ha) that are vulnerable to drought. Farmers (n=30); CCAFS; ECOHABITATS and CIAT scientists jointly selected eight practices due to their potential to improve food security and income. Some of these practices, such as good crop residue management, potentially contribute towards climate change mitigation. Our objective was to quantify the mitigation potential of different crop fertilisation options. In 2016, we conducted field survey (n=12) to collect data on management practices. The collected data was used to model GHG balances associated with the different fertilisation practices, using the greenhouse gases calculator Cool Farm Tool (CFT). The GHG balances from different fertilisation strategies were modelled comparing two scenarios: before (i.e., chemical fertilisation) and after (i.e., composting using coffee post-harvest residues, animal manure and other domestic organic wastes) the commencement of the CSV. Results show that as a result of the CSV, 70 % of surveyed farmers had changed from chemical to organic fertilisation. Estimations showed that each 1000 kg of harvested coffee generates an average of 430 kg of post-harvest waste. Replacing chemical fertilisers with organic material, such as coffee residues, was associated with a 33 % reduction of GHG emissions. However, it is important to note that these results have high uncertainty due to large uncertainties associated with both the activity data and the Tier 1 emission factors, on which CFT is based. We conclude that organic fertilisation is a suitable strategy to mitigate GHG emissions, increase the eco-efficiency through nutrient cycling and reduce dependence on chemical fertilisers. Moreover, the multi-actor participatory process was critical for promoting the transition towards climate-smartness.

Keywords: Chemical fertilisation, cool farm tool, crop residues, organic fertilisation

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