Agroforestry as a pathway to agricultural yield impacts in climate-smart agriculture investments: Evidence from southern Malawi

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Agroforestry is widely promoted for delivering not only the main food security objective of climate-smart agriculture (CSA) but also increasing resilience and mitigating climate change, especially in developing countries. Yet rigorous estimates of the impact of this pathway on agricultural yields in CSA interventions remain limited. Here we analyze maize yield effects of agroforestry within a large CSA project, funded by the US Agency for International Development and implemented from 2009 to 2014 in southern Malawi. Using original survey data from 808 households across five districts, we apply a double hurdle specification with a control function approach to account for the endogeneity of CSA program participation and intensity of fertilizer trees in the study area. We find a positive and statistically significant yield effect of CSA program participation and agroforestry intensity conditional on the extent of CSA adoption: maize yields increased, on average, by 20% for participation, and 2% for the intensity of fertilizer trees – a modest but useful result with implications for increasing agricultural productivity among smallholder farmers in sub-Saharan Africa and elsewhere. More broadly, our results show that incorporating agroforestry into CSA interventions could enhance agricultural yields among smallholder farmers in the face of climate change — a crucial aspect of sustainable development goals on hunger and climate adaptation.