Economic Efficiency and Sustainable Agricultural Intensification Practices in Smallholder Maize Farming: Evidence from Ethiopia

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Abstract:

Sustainable agricultural intensification practices (SAIPs) have been promoted to improve environmental services and farm productivity. However, whether implementations of SAIPs in isolation or in combinations increase economic efficiency of smallholder farmers is unclear. This study investigates the effects of SAIPs on costs and cost efficiency using stochastic frontier modelling techniques with an application to Ethiopian maize production. The econometric approaches account for heterogeneity across farms and heteroscedasticity in the variance of cost inefficiency. The results reveal that combinations of SAIPs appear to reduce cost and cost inefficiency variability but not when they are implemented in isolation. The average cost efficiency of the sample farms was about 80% indicating the presence of considerable room for improvement. Other factors that significantly change economic inefficiency are also discussed. Overall, the results demonstrate the relevance of exploiting synergistic effects of SAIPs in the wake of ever increasing cost of fertilizer, soil degradation and climate variability and enrich the discussion regarding the need to implement a portfolio of these practices rather than in isolation. Policies should support promotion of suites of SAIPs as packages and tackle factors hindering economic efficiency to enhance food security and incomes of smallholder farmers in developing countries. *Key words: cost efficiency, sustainable agricultural intensification practices, soil degradation, climate variability, stochastic cost frontier, smallholder farmers, Ethiopia*

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