



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

Papers downloaded from AgEcon Search may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.



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

A. Oumer; M. Burton

The University of Western Australia, UWA School of Agriculture and Environment, Australia

Corresponding author email: ali.oumer@research.uwa.edu.au

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

Acknowledgment: We gratefully acknowledge the Australian Government through Australian Centre for International Agricultural Research (ACIAR) for funding this research. Ethiopian Institute of Agricultural Research (EIAR) and the International Wheat and Maize Improvement Centre (CIMMYT) are acknowledged for access to raw data. The Ethiopian National Meteorological Agency (ENMA) is also greatly acknowledged for access to climate data. We thank farmers, supervisors, enumerators and other technical staff and researchers from various partner institutions who contributed to the data collection process. All remaining errors are ours.

JEL Codes: O13, C18

#1800

