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Production efficiency of smallholder onion producers in Ethiopia: Stochastic frontier model

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Abstract

Despite the increasing role of onion as a cash crop for farmers, its productivity in Ethiopia (8.89 t ha^{-1}) is far below the world average (19.32 t ha^{-1}). Productivity can be increased either through the introduction of new technologies or by improving production efficiency while using the existing technology. In the context of developing countries like Ethiopia, where resources are limited, it is wise to exhaustively use the potential from the second option. In this regard, as part of a collaborative TOMATO project between Weihenstephan-Triesdorf University of Applied Sciences and Bahirdar University, this study used a stochastic frontier methodology to estimate the production efficiency of onion production among smallholder onion farmers in Ethiopia. The estimation results show that the average technical efficiency among smallholder farmers is 68.5 %, suggesting that there is a substantial inefficiency in onion production. The results suggest that, by operating at full technical efficiency onion producer farmers can, on average, increase production by 31.5 %. The further results demonstrated that the main factors attributing to production inefficiency among smallholders include the age of the household head, livestock ownership, income, and use of improved seed. Specifically, while the age of the household and total livestock holding has a negative and significant effect on inefficiency, the income of the household and the adoption of improved technology affects the efficiency of smallholder onion producers positively and significantly. Overall, the results suggest that there is room for increasing onion production by improving the production efficiency of smallholder farmers through policies that improve access to improved seed, and encourage youths to participate in onion production.

Keywords: Ethiopia, onion production, production efficiency, smallholder farmers

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