



Tropentag, September 20-22, 2023, hybrid conference
“Competing pathways for equitable food systems transformation:
Trade-offs and synergies”

Potato (*Solanum tuberosum* L.) production efficiency among smallholder farmers: the case of damot pulasa district, southern Ethiopia

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Abstract

Despite Ethiopia's top potato production potential in Africa, the productivity is low and severe in the study area. Thus, the best and possible policy option is to improve the production efficiency of potatoes than introducing new technology. The study aimed to analyse the economic efficiency of potatoes in southern Ethiopia. It used the cross-sectional data collected from 162 farmers selected using the multistage sampling procedure. Descriptive statistics and the Cobb-Douglas (CD) form of the stochastic frontier econometric model were used for quantitate analysis to estimate farm level TE, AE, and EE. The Maximum likelihood estimation (MLE) result of the Stochastic Production Frontier (SPF) reveals that seed, labour, and oxen power were statistically significant. The mean TE, AE, and EE of the potato producer farmers in the area were 0.811, 0.82, and 0.673, respectively. The two-limit Tobit model was estimated separately for Technical inefficiency (TIE), Allocative inefficiency (AIE), and Economic inefficiency (EIE) scores by regressing with the source of inefficiency variables. The calculated result of the two-limit tobit model shows education, age, farm size, extension contact, household size, sex, livestock, land ownership, and frequency of weeding were statistically significant. As qualitative findings indicated, farmers in the study area were challenged by disease, lack of access to improved seeds, and the high price of local potato seed tuber. Besides these challenges, they have suitable edaphic and climatic conditions and growing market opportunities for potato produce. The government should devise livestock production and productivity enhancement policies and strategies, provide adult-based education and training, provide credit services for raising oxen holding, and introduce and provide potato extension packages like the provision of quality seed at a reasonable price.

Keywords: Economic efficiency, productivity, stochastic frontier analysis, Tobit, tuber