Technical Efficiency of Fruit and Vegetable Producers in Tamil Nadu, India: A Stochastic Frontier Approach

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ABSTRACT

In India, fruits and vegetables (F&V) significantly contribute to food and nutritional security; they also enhance the livelihoods of smallholders. In recent years, demand has been increasing for these important crops, yet their productivity has been decelerating. Technical innovations can reduce yield gaps and increase the productivity of F&V crops. This paper measures technical efficiency (TE) of F&V production and its determinants based on Cobb-Douglas stochastic frontier production function. TE is defined as the maximum output that can be produced from a specified set of inputs, given the existing technology available to the farmer. The study surveyed a sample of 240 households who mostly cultivate F&V in Salem, Trichy, and Theni districts, Tamil Nadu. Mean TE level was estimated to be 0.60. The farmers in Trichy had higher TEs than those in the other districts. This means Trichy farmers use inputs more efficiently. If the average farmer in the sample could achieve the TE level of his/her most efficient counterpart, then he/she could increase output by about 34 percent with the same level of inputs. There is considerable room for increasing F&V output without additional inputs. Accessibility of irrigation facilities significantly contributed to the higher TE in Trichy. While the test for equality showed that TE did not vary significantly across farm sizes, the larger landholdings had higher TE than smaller landholdings, indicating that farm size and TE are directly related. The results showed that accessibility of infrastructure facilities (e.g., road) contributed positively to TE. Other variables such as level of education and access to credit also had positive relationship with TE.

Keywords: technical efficiency, production efficiency, stochastic frontier
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