

Total Factor Productivity Growth in Sri Lankan Tea Estates: A Stochastic Frontier Approach

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This paper applied a stochastic frontier model to measure total factor productivity growth, technical efficiency change, and technical change in tea production in the estate sector in Sri Lanka using data from 35 tea estates relating to the period 2005 to 2019 which amounted to 4842 valid data points. A Translog Production Frontier was estimated since it was the best fit for the data. Labour (3.006) and extent (1.844) have the largest output elasticity and therefore, they can be regarded as the most important factors for tea production. However, fertilizer (0.032) and chemical (0.018) elasticities showed a value less than one, indicating an inelasticity. These low partial elasticities show that the use of these inputs has not been able to increase production at greater levels. Further, results revealed that the tea estate sector is 51.7% technically efficient which means that on average a typical tea estate had operated 48.3% below the potential output, indicating possibilities of increasing performance without any significant changes in inputs. Further, the results revealed slight technical progress during the study period and the overall rate of technical progress was estimated at 2.00×10^{-5} percent per year. Further, the overall rate of technical efficiency change declined, estimated at 1.19×10^{-5} percent per year. The combined effect of slow technical progress, dominated by the fall in technical efficiency resulted in the decline in the total factor productivity at a rate of 9.18×10^{-7} percent per year. This net effect of declining total factor productivity further raises serious concerns regarding the sustainability of the tea sector in Sri Lanka in the long run. Policies to shift the production frontier and improvements in managerial practices to combat declining efficiency levels are recommended.

Keywords: *Stochastic Frontier Approach, Tea Estate Sector, Technical Efficiency, Technical Change, Total Factor Productivity Change*