Environmental Efficiency of Tea Production: The Case of Uva Tea Growing Region in Sri Lanka

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Sri Lanka tea industry needs to improve its productivity to remain competitive in the international tea market. Tea producers as individual decision-making units have a greater responsibility towards achieving and sustaining the required level of productivity. Many factors influence the productivity of tea producers, however, production environment characterized by the weather variables such as temperature, rainfall, and wet days are beyond the producer's control. The analysis of these environmental factors within a frame of total factor productivity concept or environmental efficiency analysis captures the role of the production environment of the producer. Surprisingly, studies on analysing environmental efficiency as a measure of the productivity of perennial plantation commercial crop production units are seldom in the literature. Based on a monthly panel data from 12 different tea estates on the Uva region over 19 years (2000-2018), this study analyses the environmental efficiency of estate level tea production. Specifically, we use a stochastic frontier production function to reveal the total factor productivity index (TFPI) for the selected estates over 19 years and decompose to the environmental efficiency of the tea production. According to our findings, the environmental efficiency scores of estate level tea production vary from 0.86 to 1.05 over the period from 2000 to 2018. More importantly, the environmental efficiency of 14 years throughout the studied period is less than one indicating the estates of the Uva region were operating in a poor productive environment. Our findings suggest that climate change impacts tea production moreover, these environmental factors may also affect the production environment of tea plantations in other tea growing regions in Sri Lanka.

Keywords: Productivity, Total Factor Productivity Index, Environmental efficiency, Plantation