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The effects of seasonal variations of weather on tea production: A Ricardian analysis

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Abstract

The Ricardian approach has broadly been used in the literature to estimate the economic impacts of climate change on net revenues from agriculture in different geographies due to its ability to account for farmer adaptation. However, its application in the plantation sector is quite limited. Having lower adaptive capability with largely cultivated extents of perennial crops, plantation lands are principally vulnerable to climate change. However, even with strong trends and the likelihood of future changes are evident in the seasonality of weather, its impacts on plantation economies have not been properly evaluated. This study aimed to estimate the economic impact of seasonality of weather on Sri Lankan tea production and its spatial heterogeneity across major tea growing regions. The study employs a panel Ricardian technique, utilizing a largely collected data set including climate and non-climate data from 49 tea farms from 2004 to 2018. The results of the regression analysis suggested that the weather variables of the major monsoonal seasons have a significant impact on the revenue generation of Tea plantations. The marginal impact analysis of the study quantifies the economic impact of these weather variables. Specifically, a 100mm increase in southwest monsoon rainfall increases the tea plantation net revenues by 14.2%, and a 1°C increase in mean temperature during the southwest monsoon season decreases the net revenues by 2.2%. Accounting for the spatial heterogeneity of impacts, 1°C increase in mean temperature during southwest monsoon season is found to be affected to revenue generation from tea plantations in Up Country by 14.3% positively and in Low Country by 6% negatively. Overall, we find that long-term weather variables can explain about 5-6% of the variation in net revenues across tea estates. The evidence from this study may be useful for Sri Lankan policymakers to facilitate greater preventive measures during the main seasons to counteract seasonal uncertainty.

Keywords: Climate change, Panel data, Perennial crops, Seasonality, Sri Lanka

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