Climate, Technology and Variations in Profit in Tea Production: A Study on Nuwara Eliya Tea Estates

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Tea is the major foreign income earning crop in Sri Lanka and its GDP contribution is 2% while the 65% of export agriculture revenue and 15% of foreign exchange earnings is also obtained through the tea industry. Also, about 20% of population depends directly or indirectly on the tea sector. The sustainability of this industry depends on its profitability and if not sufficiently profitable, these tea lands maybe converted to other uses in time to come. As predicted by climatologists, future weather is expected to be different from the present. Therefore, the main purposes of this study were to investigate the variability in profits among tea estates and to see weather, climate and technology influence this variation [risk]. This study was carried out in Nuwara-Eliya district because, it is the largest tea producing district in Sri Lanka as well as Nuwara-Eliya teas have high foreign demand. Nuwara-Eliya district consists with two tea growing regions which are Dimbula and Nuwara-Eliya; therefore, when selecting the sample variation of the agro ecology was considered. Data collection followed a stratified random sampling procedure. Twenty-three year's production and climatic data were collected from thirty-five estates were used in the analysis. Variance of the error term of the estimated profit function was assumed to be related to risk. Annual total rainfall, annual maximum and minimum average temperature were taken as the climatic variable while technology change was represented by a time trend variable. According to the result of this study, all weather variables showed 'U' shaped relationship with the variance. According the results the minimum variability in profit is obtained when the optimum annual rainfall is around 2000 mm, the annual maximum average temperature was 21 ˚C and the annual minimum temperature was 12.25 ˚C. Therefore, estate sector needs adaptation strategies for weather as well as possible changes in the climate that is bound to happen.

Keywords: Climate change, Nuwara-Eliya district, Profit risk, Tea estate, Technology changes

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