The Impact of Seasonal Drought on Tea Cultivation in Low-Country Wet Zone of Sri Lanka

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Drought affects significantly on various crops, including tea (*Camellia sinensis* (L.) Kuntze). Sri Lankan tea cultivation faces frequent challenges of seasonal drought. In the present study, the impact of seasonal drought on tea cultivation in the Deniyaya area, which belongs to the low -country wet zone of Sri Lanka, was evaluated to identify the economic and social impacts of drought on the Sri Lankan tea industry, employing a mixed-methods approach. As quantitative data, soil parameters (pH, electrical conductivity, moisture and phosphate concentration) and climatic parameters (air temperature, rainfall and relative humidity) were used in the study. Qualitative data were obtained through interviews and surveys with tea industry stakeholders. Regression analysis was used to quantify relationships between soil parameters, climate variables, and tea outcomes. Warmer temperatures (27.2 ^{o}C - 29.6 ^{o}C) during 09/30 -10/03 in 2023 led to a higher tea yield of 149 kg per week in acre. Consistent temperature (27.6 ^{o}C) during 10/03 - 10/07 resulted in a stable yield of 125 kg. However, higher temperatures (29.2 ^{o}C – 34 ^{o}C) led to reduced tea yield critically. In another way, higher soil phosphate levels retained during the period of one month resulted in mitigation of the low crop yield. Soil pH level and conductivity did not show an observable effect on tea yield in this period. Soil moisture directly depends on average rainfall and soil moisture percentage involves tea outcomes. Optimizing environmental conditions and implementing effective agricultural practices are essential for maximizing tea yield in drought periods.

Keywords: Seasonal drought, Phosphate level, Soil, Climatic parameters, Tea cultivation