ENSO influences on the mean temperature in Sri Lanka

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The inter-annual and seasonal variations of mean temperature affect crop production, public health, water and natural resources. Even though the range of temperature in Sri Lanka is modest, small variations can have serious ecological implications such as its influence on dengue and malaria transmission. The El Nino-Southern Oscillation (ENSO) is a primary mode of climate variability over South Asia. In this paper, the relationship between Sri Lankan mean temperature and ENSO and its decadal variation is quantified based on composite and correlation analysis. A mean temperature data index was constructed by averaging data from 18 well distributed stations of the Department of Meteorology for the twentieth century. The ENSO index of NINO3.4 data which is the mean of sea surface temperature in the equatorial eastern Pacific Ocean was used for the analysis. ENSO phases were identified as El Nino (NINO3.4> 0.5), Neutral (-0.5<NINO3.4<+0.5) and La Nina (-0.5>NINO3.4).

A composite analysis of mean temperature shows that Sri Lanka has an annual mean temperature of 25.91, 25.73 and 25.63 °C during El Nino, Neutral and La Nina respectively. Overall, El Nino leads to slightly warmer conditions in all the months except May and October. These are the two months from which the South-West and the North-East monsoon seasons are in transition. The significant relationships between ENSO and temperature are brought out by undertaking the analysis for seasons that are variants of the conventionally monsoonal seasons (December-February, March-April, May-September and October-November). On average, the temperature during the El Nino

phase is higher by 0.425 (November-February), 0.4 (March-April) and 0.225 °C (June-September) than during the La Nina phase. The correlations of ENSO indices with mean temperature are statistically significant for November-February, March-April and June-September seasons have largely remained so in the twentieth century.

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