

**EVALUATION OF THE TRENDS IN CLIMATE CHANGE WITH
RESPECT TO SEVERITY AND FREQUENCY OF OCCURRENCE
OF WET AND DRY EVENTS OF RAINFALL IN ATHTHANAGALU
OYA BASIN**

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ABSTRACT

Socioeconomic aspects of life have changed due to alterations in the climatic patterns. Sri Lanka needs to pay more attention to the climate extremes as the available water resources are directly affected by these changes. Hence planning and management of water resources based on climatic patterns play a key role in sustainable development. Sustainable planning and management of water resources of Aththanagalu Oya that feeds many large and small scale multi-purpose water extraction schemes in Sri Lanka is vital in the event of climate change. Thus, an analysis of the shifts and trends of climatic patterns with respect to wet and dry events within the Aththanagalu Oya basin was carried out to evaluate the state and the extent of climate change using Standardized Precipitation Index(SPI). Daily rainfall data covering the period from January 1991 to February 2011 of Henarathgoda, Vincit, Chesterford, Kirindiwela, Nittambuwa and Pasyala rainfall gauging stations which are located within the Aththanagalu Oya catchment area were obtained from the

Department of Meteorology, Sri Lanka. Two periodic intervals of years (1991-2000 and 2001-2011) were formulated and monthly accumulated rainfall for each month of the considered periods were used as the input to the SPI Model in Mat Lab R2007b (version 7.5). The events were ranked into five classes (normal, mild moderate, severe and extreme) based on the severity of each event and the variations in climate (with respect to SPI) were evaluated using Paired Chi-Square method. A decrease in dry events and an increase of the wet events in the climatic pattern of recent years (2001-2011) compared to the past (from 1991 to 2000) in Vincit, Kirindiwela, Nittambuwa and Pasyala could be observed in accordance with the SPI analysis while an opposite trend was observed in Henarathgoda and Chesterford. Unlike the predictions of many studies which expect significant alterations in climate patterns in the recent years than the past years, according to the SPI approach, only the wet events of Pasyala (a significant increasing trend of wetness) and the dry events of Vincit (a significant decreasing trend of dryness) indicate significant alterations in climatic patterns while the climatic variations indicated by the rest of the areas are statistically insignificant. Hence, a significant increase in wetness in Vincit and Pasyalain terms of both severity and frequency of occurrence with variations of rainfall seasonality could be predicted in accordance with the SPI.

Key words: climate change, wetness, dryness, severity, frequency, SPI