

Develop Drought Monitoring in Sri Lanka Using Standard Precipitation Index (SPI)

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ABSTRACT

Drought is one of the major hazards related to water in the world. Every year, many people die and economical losses occur over most of the countries in the world due to droughts. Sri Lanka usually every year faces droughts damaging the properties, causing death to human beings and agricultural failures. Droughts occur due to the irregular rainfall pattern i.e deficit of rainfall.

This Report addresses important considerations on simulating a suitable drought monitoring method to suit the Sri Lankan content. To detect drought conditions, Standard Precipitation Index (SPI) is the most commonly used tool in the world today. In this study, SPI was simulated with the cumulative rainfall and average rainfall in Hambantota area for 2001 to verify the use of SPI and to determine the suitable SPI time Scales.

The results showed that the 3-month SPI time scale is the most suitable to monitor onset of drought, but 6-month time scale is explained the severity and the length of drought period in Sri Lanka.

KEYWORDS: *Drought monitoring, SPI, Cumulative Average Rainfall, Cumulative Rainfall, SURFER 09 software.*

1 Introduction

Droughts and floods are extreme climate events that percentage-wise are likely to change more rapidly than the mean climate (Trenberth et al. 2003). The damages and the economic losses due to the flood and droughts are very high and it will affect to very large number of people in each year (Wilhite 2000). Drought is the single most important climatological hazard, often aggravated by human actions. Drought may start at any time and reach varying levels of severity (Premalal 1998). The occurrence of dry spell or droughts is not normally expected to be a characteristic feature of the climate of tropical islands. Drought is described as a deficiency of precipitation over an extended period of time, which results in shortages of water. Drought is also a normal, recurrent feature of climate that occurs in most climatic zones. Generally, these droughts have a duration of 6 to 9 months (Lyon et al., 2009), but the typical length for humid tropics regions are 6 months (Sheffield and Wood, 2007). Drought is also related to the timing of precipitation. Other climatic factors such as high temperature, high wind, and low relative humidity are often associated with drought.

Often a region adopts itself to a certain level of water shortage based on the long-term climatic conditions experienced by it. Any negative departure from these levels creates conditions of drought, depending on the intensity and duration of this deficit. Thus drought conditions differ from region to region. Hence the definitions of Droughts are area specific. Hence in general, drought is defined as an extended period - a season, a year, or several years - of deficient rainfall relative to the statistical multi-year average for a region. However, dozens of more specific drought definitions are used (<http://www.un-spider.org/risks-and-disasters/disaster-risk-management-guides>).