

AN INVESTIGATION OF THE SENSITIVITY OF THE SATELLITE-BASED AGRICULTURAL DROUGHT INDICES TO MONITOR THE CROP CONDITION OF RAIN-FED AGRICULTURE IN DRY ZONE, SRI LANKA

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Vegetation Health Monitoring from space is used widely and the Normalized difference Vegetation Index (NDVI) is the most popular Vegetation index. It represents the photosynthesis capacity of vegetation. The number of drought indices are calculated by comparing the NDVI of time of observation with the Long term NDVI values and called as “multi-temporal drought indices”. Some are developed using only the data of the time of observation and no time-series data required and called as “non-temporal drought indices”. This study analysed multi-temporal and non-temporal drought indices calculated using NDVI, Normalized Difference Water Index (NDWI), and Land Surface Temperature (LST). Freely available 19 years MODIS satellite data (MOD13Q1 and MOD11A2) were used to calculate them and discussed the sensitivity of the indices for the monitoring of agricultural droughts and crop conditions in the rain-fed dry zone paddy agriculture in Sri Lanka. Relationship with all variables with Climate Hazards Group Infrared Precipitation with Station data (chirps), rainfall anomaly, and Standardized Precipitation Index (SPI) of different time scales were analysed, for the selected agricultural lands. Also, this study identified that the false drought conditions can be seen in multi-temporal drought indices, due to the changes of the time of the start of the cultivation season and suggested a method to overcome such errors in heavily dynamic climatic areas. The new approach is called “Enhanced multi-temporal drought indices”.

Keywords: *Drought, Vegetation health, NDVI, NDWI, NDWI Anomaly*