



Assessing the occurrence of drought based on SPI, NDVI and LST for indian region

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Water scarcity is one of the major global problem leading to severe drought. Droughts are recurring climatic events, bringing significant water shortages, economic losses and adverse social consequences.

There is an alarming situation due to the ineffectiveness of present reactive practices only based on crisis management. The current drought management practices focus more on the symptoms and impacts of drought than underlying the causes for the vulnerabilities associated with these impacts. The preparedness for drought should form an important part of national environmental policy which focuses more on risk reduction accompanied with drought mitigation and preparedness plans.

At present, India have limited institutional and technical capacity to prepare for drought and to mitigate its impact. Hence, the coping capacity of nation to mitigate droughts can be enhanced with improved early warning system and forecasted drought scenario.

The present study aims to develop an early warning system (EWS) based on historical monthly precipitation data through commonly used meteorological index i.e. Standardised precipitation Index (SPI). The meteorology-based approach doesn't consider the ground conditions. As a result, it is essential to adopt remote sensing technology along with direct meteorological based approach to infer drought severity information. Hence, the study also evaluates the region for its vegetation condition through Normalised difference vegetative Index (NDVI). Further, the results from the two analyses are compared and correlated with Land Surface Temperature (LST) to estimate the severity of drought since temperature also plays a significant role in occurrence of drought. The study shows negative correlation between LST and NDVI for the summer months and positive relation during winter due to sudden drop in temperature. The SPI-12 values predicted for future drought scenario shows extreme drought conditions where values are ranging from -2.44 to -4.59 for most arid regions of India. The framework of this study which includes correlation of SPI, NDVI and LST can be used to forecast drought and prepare EWS. The study will help in formulating policies and strategies based on local and national level drought analysis. Further, the approach can be used to analyse the hydrological drought using ground water levels and correlate with the present approach to develop more precise EWS.