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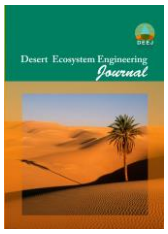

Investigation of meteorological and agricultural drought trends in hyper-arid, arid and semi-arid regions of the world

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Abstract

Drought is one of the most costly natural hazards and is more dangerous in arid and semiarid regions which suffer from limited water resources. Climate change can also affect drought intensity; therefore, it is essential to analyze the trends of drought, particularly in these regions. This study surveyed the trends of meteorological and agricultural drought in hyper-arid, arid and semiarid regions of the world using the standardized precipitation index (SPI). Short time scales of 1-, 3- and 6-month SPI (moderate to severe and extreme drought) were derived for the period of 1970 to 2014 from the gridded precipitation data provided by CRU. The trends of the time series were computed using the Mann-Kendall nonparametric statistical test. The results showed that non-significant trends were dominant; however, some territories showed significant upward and downward SPI trends in different parts of the study regions. The significant negative SPI trends, which imply increased drought, were observed in the Middle East, central Australia and western North America. An increase in drought severity can increase consumption of water resources, particularly in developing countries.

Keywords: Arid, drought, global scale, hyper-arid, semi-arid, trend.

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