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Drought Frequency Follows the Regional Climatic Factors

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Among various natural hazards, droughts have the most damaging effect on environment and economy, on which human life heavily depends. The major impacts of drought include reduced crop production, decrease in availability of drinking water, hydropower production, forest fires and may lead to poverty and regional conflicts. The frequency of such droughts is governed by climatic parameters and it varies across different climatic regions. Precipitation, temperature and humidity, and hence, evapotranspiration, are the most common and governing climatic parameters. In the present study, the rainfall data (113 years from 1901-2013) of 515 districts located across different climatic regions of India have been used for frequency determination for each district. Although the relationship between drought return period and potential evapotranspiration (PET)-precipitation (P) ratio has been derived for small spatial data, this study covers the whole country and such a scale does not appear to have been covered so far in literature.

The average drought frequency (i.e. yr-1) gradually decreases from once in two to three years in the arid regions (12 > PET/P [U+F0B3] 5), four to six years in the semiarid regions (5 > PET/P [U+F0B3] 2), six to nine years in the sub-humid regions (2 > PET/P [U+F0B3] 3/4) and 10 years or more in humid regions. It decreases exponentially with increase in wetness in semiarid to sub-humid regions with PET/P ratio lying between 3.5 and 0.5. Such relations can be useful for proactive mitigation and planning of appropriate drought management strategies in different climatic regions.