Maha seasonal drought:
influence and predictability of the
October-November rains

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Drought occurrence during the Maha season (October to March) was analyzed using the 6-monthly Standardized Precipitation Index (SPI) from 1961-2002. Two severe droughts (-1.99>SPI>-1.5), 10 moderate droughts (-1.49<SPI<-1.0) and 7 mild droughts (-1.0<SPI<-0.5) occurred during this period. Fourteen of the 19 droughts coincided with suppressed October- November (ON) rainfall.

The strength of the contemporaneous zonal (westerly) wind at 850hPa (U850) over the central Indian Ocean (5°S-15°N, 40°E- 105°E) influences ON rainfall. ON rains fail under two scenarios: first, when U850 is anomalously strong (anomaly =1.61ms-1); and second, when U850 is weak (anomaly = -0.53ms-1). Scenario1 droughts occurred in 1964, 1971, 1980, 1981, 1988, 1995, 1996 and 2001 and scenario2 droughts occurred in 1968, 1984, 1989 and 1991.

The study demonstrates that ON rain failure can be predicted with good skill using predicted fields of contemporaneous U850 issued in September. It assesses forecast skill at a 132 rain gauges using retrospective forecasts of U850, for 1981-2002, from ensemble runs from three Global Climate Models (GCMs). The GCMs used are: the fully-coupled Climate Forecast System (CFS) of the National Centers for Environmental Prediction (NCEP), U.S.A; and two versions of the ECHAM4.5 of the Max Planck Institute for Meteorology, Germany [first: forced with persisted sea surface temperature anomalies (ECHAM4.5_PSST); and second: forced with constructed analogues of sea surface temperature anomalies (ECHAM4.5_CA)]. Scenario1 droughts are captured by the three models. Scenario2 droughts of 1984 and 1989 are captured by the CFS and the ECHAM4.5 forced with constructed analogs of SSTAs.