

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
**RAJYA SABHA**  
UNSTARRED QUESTION No. 476  
TO BE ANSWERED ON THURSDAY, NOVEMBER 27, 2014

**MONITORING OF VARIABILITY OF WEATHER PHENOMENA**

**476. DR. K.V.P. RAMACHANDRA RAO:**

Will the Minister of **EARTH SCIENCES** be pleased to state:

- (a) whether Government monitors the variability of the weather phenomena and development of abnormal weather pattern like drought, flood, cyclone, heat and cold waves, etc. on a continuous basis; and
- (b) if so, the findings made in the monitoring, and to what extent the extreme conditions are on the rise?

**ANSWER**

MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND  
MINISTRY OF EARTH SCIENCES  
(DR. HARSH VARDHAN)

- (a) Yes Sir.
- (b) The Government continuously monitors the variability of the weather phenomena, extremes and development of abnormal weather pattern potentially leading to drought, flood, flash flood, cyclone, rain induced landslides, heat cold wave, etc. on a continuous basis. Records of past weather events show that extreme values in respect of heavy rainfall, maximum and minimum temperatures, seasonal rainfall etc. remained unsurpassed in many cases.

Heavy rain events (>10 cm/day) over central India are found to have increased in the recent decades while weak and moderate events are decreasing. The extreme rain events which are becoming more intense in recent years are localized and could be part of the natural variability of the monsoon system.

The occurrence of heat wave conditions is found to be more frequent in May than in June, while very few heat waves occur in the months of March and April. The spatial changes in minimum temperature are found to be decreasing in most parts of Western Ghats and increasing in most parts of Himalayan region and certain parts of the north-eastern region and such warming is confined to winter and post-monsoon seasons. No such pattern is discerned in respect of other weather phenomena.

Spatial pattern of trend in mean annual temperature anomalies, for the period 1902-2012, suggests significant positive (increasing) trend (0.5 °C) in general with few pockets of 1.0 °C over most parts of the country except some parts of Rajasthan, Gujarat and Bihar, where significant negative (decreasing) trend was observed. No significant long-term trends are reported in the frequencies of large-scale droughts or floods in the summer monsoon season. The total frequency of cyclonic storms that form over the Bay of Bengal has remained almost constant. Although, the monsoon rainfall at all India level does not show any trend but on regional scale, areas of increasing trend is discerned. It is not clear if this increasing trend in the heavy rainfall events is attributable to global warming.

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