GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. **3157**
TO BE ANSWERED ON THRUSDAY, AUGUST 7, 2014

IMPACT OF GLOBAL WARMING AND CLIMATE CHANGE ON RAINFALL PATTERNS

3157. Shri Avinash Pande:

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

(a) Whether Government has undertaken any study to analyse the impact of global warming and climate change on rainfall pattern in India, if so, the details thereof; and

(b) Whether there has been a decline average seasonal rainfall in India over the last five decades, if so, the reasons therefore?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES (Independent Charge)
(DR. JITENDRA SINGH)

(a) &(b) Yes Sir, Ministry of Environmental and Forests (MoEF), Govt of India had undertaken the Indian second National Communication to UNFCCC during 2009-2011(NATCOM-II). The communication had been a national effort which involved many multi-disciplinary scientific groups. Ministry of Earth Sciences carry out scientific studies on climate change and variability under Global and Regional Climate Change (GRCC) programme. Under GRCC programme of the Ministry of Earth Sciences, Earth System Science organisation (ESSO) has established a dedicated Centre for Climate Change Research (CCCR) under the Indian Institute of Tropical Meteorology (IITM), Pune.

Monsoon rainfall varies on different spatial and temporal scales. Extreme rainfall events that occur at some isolated places (viz. heavy rainfall over Mumbai or in Rajasthan) are highly localized and are part of the natural variability of the Indian monsoon system itself. Although, some recent studies hint at an increasing frequency and intensity of extremes in rainfall during the past 40-50 years, their attribution to global warming is yet to be established. Moreover, the report of the Inter- governmental Panel on Climate Change and our country's own assessment using regional climate models indicate that the extremes rainfall events are likely to be more frequent in the later part of the 21st century in the world including India. As regards other extreme weather phenomena, there are many other reasons for their occurrence, which cannot always be related to climate change.

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. Summary of the observed long term changes so far include:

(i) Mean annual surface air temperatures show a significant warming of about 0.5 degree C/100 years during the last century.

(ii) No significant long-term trends are reported in the frequencies of large-scale droughts or floods in the summer monsoon season.

(iii) The average seasonal rainfall over India has shown decline in the last five decades, especially after 1970, that is not found to be statistically significant. Further over core monsoon zone, the contribution from increasing heavy rain events is offset by decreasing moderate events and hence on the long term the change is not appreciable. Many studies have discussed the possible reasons for recent weakening monsoon.

(iv) Studies were undertaken in four climate sensitive regions of the country, viz. Himalayan Region, Western Ghats, North Eastern Region, Coastal Areas to assess the possible impacts on the four sectors viz. agriculture, water, forests and health. A Report entitled, Climate Change & India: A 4X4 Assessment – A Sectoral and Regional Assessment of Impact of Climate Change in 2030s, has been released by the Government during November, 2010 under the aegis of the Indian Network of Climate Change Assessment (INCCA).

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