GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
STARRED QUESTION No. *126
ANSWERED ON 28/07/2022

TEMPERATURE IN DELHI/NCR

***126. SHRI NARAIN DASS GUPTA:**

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the steep rise in pre-monsoon surface air temperature, land surface temperature and relative humidity in Delhi/NCR off late is a cause of concern;
(b) whether any study has been undertaken by Government to understand the phenomenon, if so, the details of the findings thereof; and
(c) whether Government is contemplating a new climate Action Plan to deal with soaring heat stress in Delhi/NCR, if so, the details thereof?

ANSWER
THE MINISTER OFSTATE(INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

(a)to (c): A Statement is laid on the Table of the House.

STATEMENT LAID ON THE TABLE OF THE RAJYA SABHA IN REPLY (a) to (c) TO STARRED QUESTION NO. *126 REGARDING "TEMPERATURE IN DELHI/NCR" TO BE ANSWERED ON THURSDAY, JULY 28, 2022

(a) Yes Sir. The details of average values of maximum and minimum temperature and relative humidity (RH) over Delhi during the season for the last three years with respect to Safdarjung station are given below:

Year	Average Pre monsoon Max temp (˚C)	Average Pre monsoon Min Temp (˚C)	Average Pre monsoon RH 0300 UTC (%)	Average Pre monsoon RH 1200 UTC (%)
2020	34.4	20.7043	68.4	43.5
2021	36.0	21.35484	61.4	37
2022	37.9	21.96667	60	31

From the table, it is clear that there has been a rise in Maximum and Minimum temperature over Delhi during Pre monsoon season during last three years whereas there is no such increase in Relative Humidity.

In addition to above, the trend in Pre-monsoon Maximum, Minimum and Mean temperature for Delhi for the period 1951-2022 are given in Figure-1 (given in Annexure).

(b) Several studies have been carried out on the pre-monsoon temperature pattern of Delhi and the likely causes. Urbanization is one of main causes that can influence the changes in temperature pattern within the city and form heat islands. This is reflected by the trends of difference in annual mean minimum temperature of the two stations of which one (Safdarjung) is within the city and the other is in the outer periphery in Delhi NCR (Palam).

A recent article published in Nature, describes the reason for India's prolonged spell of heat wave experienced during pre-monsoon season 2022. The causes were mentioned as the absence of rainfall and convective activities for a long period, absence of Western Disturbances and the subsidence of warm and dry air in lower and middle tropospheic levels over North Arabian sea and adjoining South Pakistan and Gujarat.

(c) It is mentioned that, Heat wave is one of the severe weather phenomena for which IMD issues early warning. In the country, appreciable rise in maximum temperatures as well as heat waves are found to be more in the months of April, May & June. As an initiative IMD is issuing Seasonal Outlook for temperatures for the months of April, May & June in the last week of March for planning purpose. This outlook brings out the expected scenario of heat waves also during the period.

The seasonal outlook is followed by Extended Range Outlook issued on every Thursday for next two weeks. In addition to this, the forecast and the colour coded warnings for severe weather including heat wave warning over Delhi is issued on daily basis for next five days with outlook for another two days.

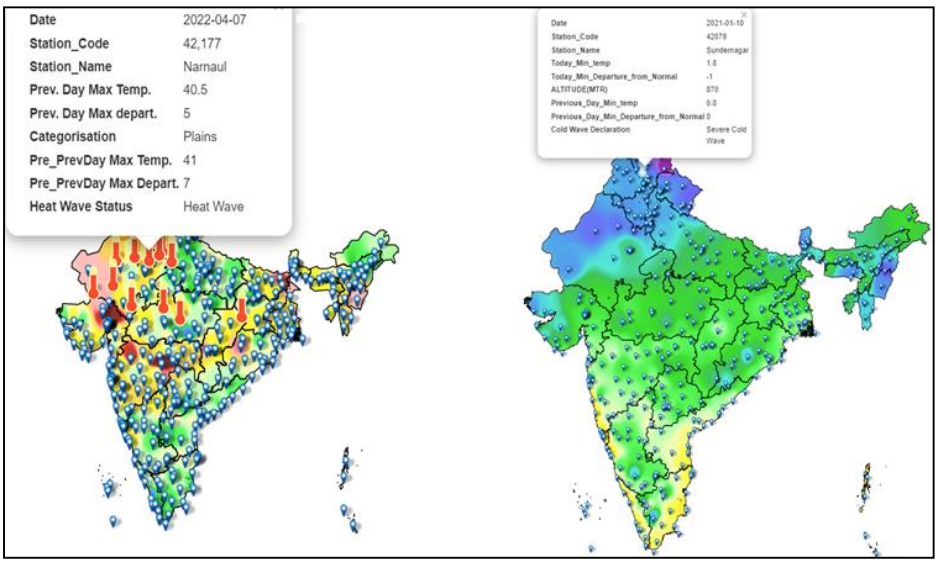
IMD has started Forecast Demonstration Project (FDP) on heat waves for the hot weather season under which a detailed daily report including realized data of heat waves, weather systems leading to the occurrence of heat waves, diagnosis on the basis of Numerical Model outputs and forecast and warnings for five days is prepared. This bulletin is disseminated to all concerned including health departments. IMD started issuing an additional bulletin on heat wave in the morning (8 a.m.) valid for 24 hours for supporting the planning of activities for the day and this bulletin is also disseminated to all concerned. All these bulletins are posted to IMD website also, on a special page created for Heatwaves.

As an adaptive measure, IMD in collaboration with local health departments have started heat action plan in many parts of the country to forewarn about the heat waves and also advising action to be taken during such occasions. Heat action plan became operational since 2013.The Heat Action Plan is a comprehensive early warning system and preparedness plan for extreme heat events. The Plan presents immediate as well as longer-term actions to increase preparedness, information-sharing, and response coordination to reduce the health impacts of extreme heat on vulnerable populations. NDMA and IMD are working with 23 states prone to high temperatures leading to heat-wave conditions to develop heat action plans.

Recent advancement made in Heat wave forecast and warning follow:-

- **Heat Wave Monitoring and Forecasting Information on GIS**

a) Interactive Map in Web-GIS for actual maximum/minimum temperature & its Departure from normal temperature. (Current Temperature).
b) Interactive Map in Web-GIS for Heat Wave & severe Heat Wave along with Warm Nights & very Warm Nights. (Current Temperature).



c) Interactive Map in Web-GIS for last 5 days actual Maximum/minimum temperature & its Departure from normal temperatures, Heat Wave, severe Heat Waves, Warm Nights and very Warm Nights to assess the impact of the spell of Heat waves. (Past 5 days Heat Wave and Warm Night Situation).

d) Normal Relative Humidity (RH) for March to June months based on 0830 and 1730 IST are provided to assess the impact of RH during the Heat Wave days. The impact of Heat Waves becomes more severe with an increase in the RH.

- Issue special heat wave & its impact bulletin (March to June) at 1600 hrs IST by including the impacts of Minimum Temperature, humidity and wind.

- Heat Wave hazard analysis for entire country for four hot weather months (MARCH, APRIL, MAY & JUNE) considering the Maximum Temperature, Minimum Temperature, Humidity, Wind and Duration is completed. This will lead to identification of hazard scores based on different meteorological parameters aggravating impact of Heat Waves. These scores could in future be utilized as threshold to generate Heat Wave impact based alerts for the specific locations.

The link for Heat Wave information web-page is:

https://internal.imd.gov.in/pages/heatwave_mausam.php

ANNEXURE

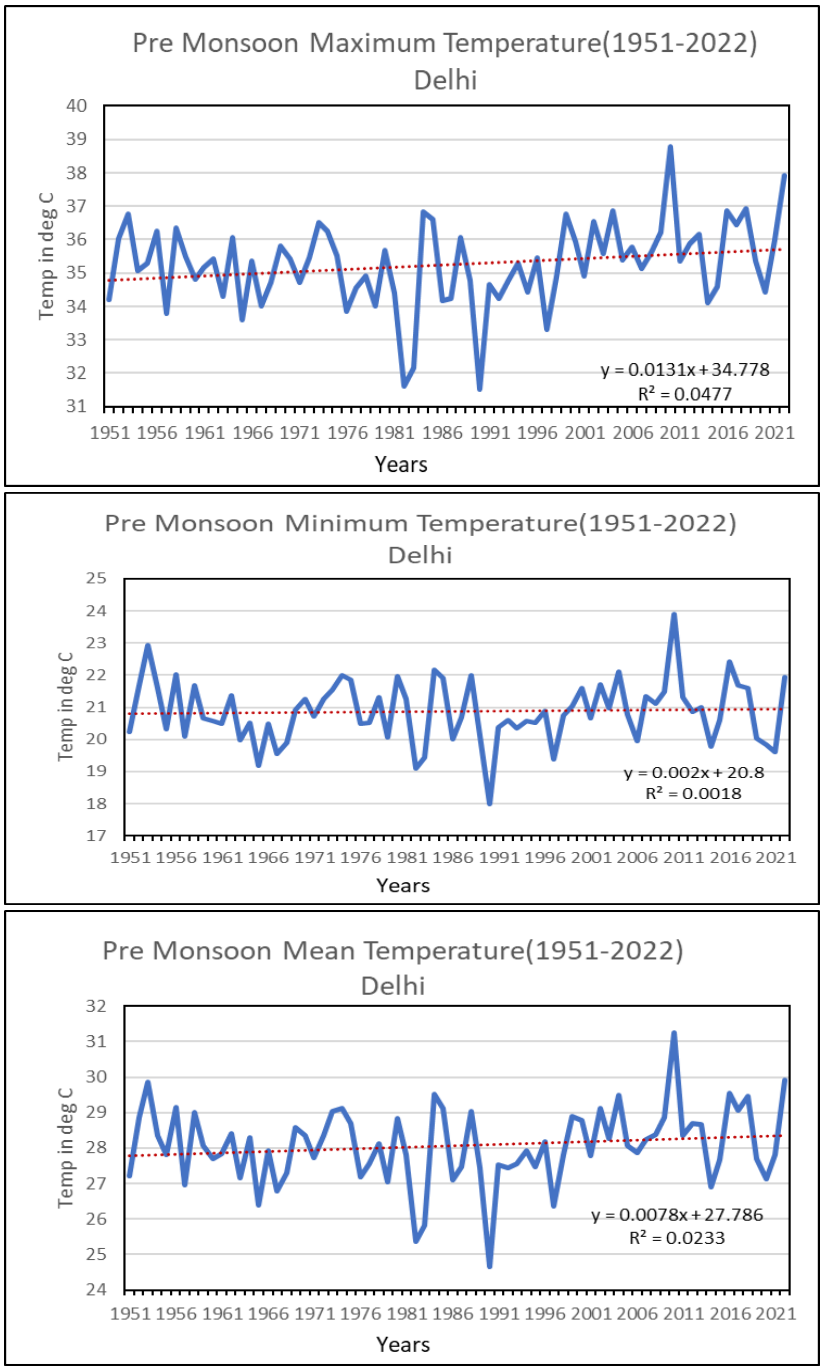


Figure 1.The Temperature time series over the Delhi region for the period 1951 to 2022.

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