

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 1145
TO BE ANSWERED ON FRIDAY, NOVEMBER 22, 2019**

RISE IN TEMPERATURE

**1145. DR. UMESH G. JADHAV:
SHRI RAMDAS C. TADAS:
SHRI SANGAM LAL GUPTA:
SHRI CHANDRA PRAKASH JOSHI:**

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the details of the rise in temperature taking place in the country during the summer season along with the names of places in the country having seen the highest increase in temperature;**
- (b) the diseases caused by the rise in temperature during the summer season;**
- (c) the factors responsible for rise/ increase in temperature; and**
- (d) whether the Government has formulated any scheme/plans or alternative to control the rise in temperature and curb diseases caused therefrom and if so, the details thereof?**

ANSWER

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

- (a) The time series of temperature anomaly for the country during summer season (March to May) is given in figure 1 and the spatial temperature trend over the country is given in figure 2. The maximum increase in temperature (around 3 Degree Celsius) is observed over Uttarakhand, whereas an increase of the order of about 2 Deg. C is observed over the parts of East Rajasthan and East Madhya Pradesh.**

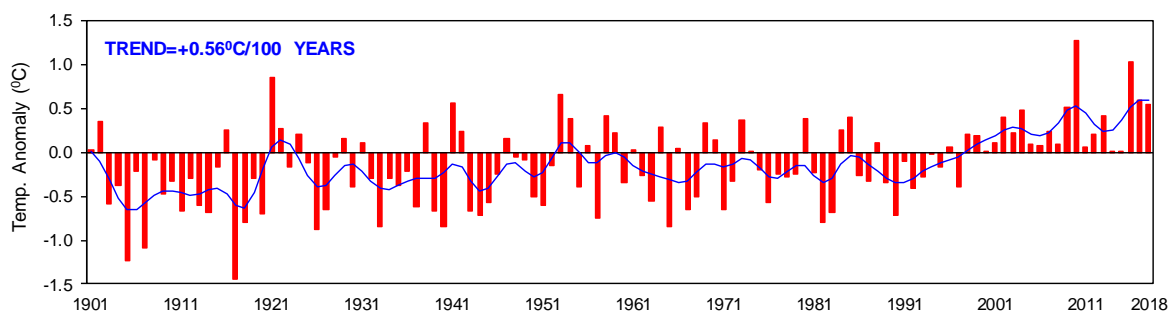


Figure 1. Temperature anomaly for the country during Summer Season (March to May) for the period 1901 to 2018.

MAR—MAY MEAN TEMP ANOM TREND (1901—2018)

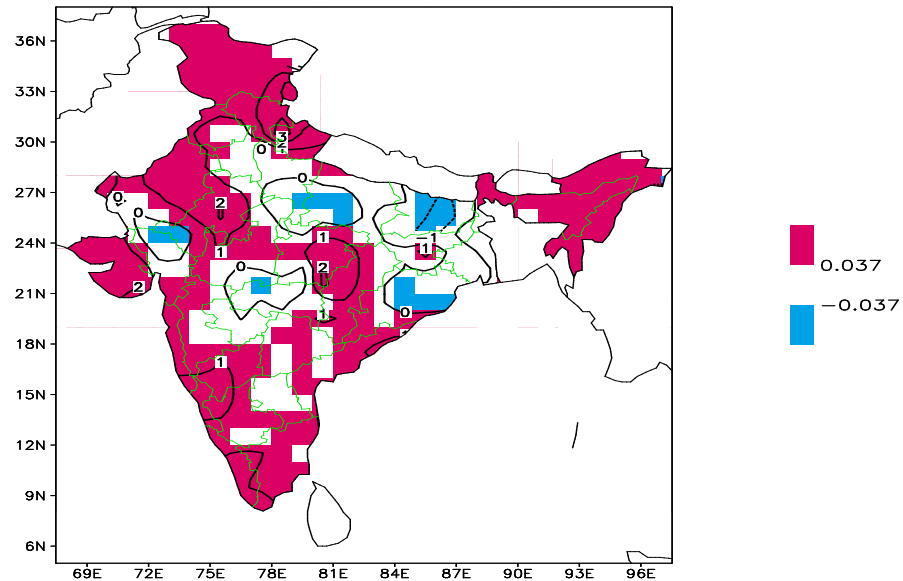


Figure 2. Temperature anomaly trend during Summer Season (March to May) for the period 1901 to 2018.

(b) Abnormal temperature events can impose severe physiological stress on the human body as the body operates best within a fairly normal temperature range. There is a marked relationship between human mortality and thermal stress. During unusually hot episodes, deaths from different causes can rise significantly with the elderly at greater risk than others. India has experienced manifold increase in the human deaths during various heat waves of years like 1971, 1987, 1997, 2001, 2002, 2013 & 2015. Recent years (2001-2015) have registered the highest number of deaths due to heat wave events compared to previous 3 decades.

(c) & (d) One of the reasons for the increasing temperature is global warming associated with the increase in greenhouse gasses like Carbon dioxide, Methane etc. in the atmosphere. As an adaptive measure, India Meteorological Department (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.

The main aims of the Heat Action Plan are:

- **Establish Early Warning System and Inter-Agency Coordination to alert residents on predicted high and extreme temperatures. Who will do what, when, and how is made clear to individuals and units of key departments, especially health department.**
- **Capacity building / training programme for health care professionals at local level to recognize and respond to heat-related illnesses, particularly during extreme heat events. These training programmes focus on medical officers, paramedical staff and community health staff so that they can effectively prevent and manage heat-related medical issues to reduce mortality and morbidity.**
- **Public Awareness and community outreach: Disseminating public awareness messages on how to protect against the extreme heat-wave through print, electronic and social media and Information, Education and Communication (IEC) materials such as pamphlets, posters and advertisements and Television Commercials (TVCs) on Do and Don't and treatment measures for heat related illnesses.**
- **Collaboration with non government and civil society: Collaboration with non-governmental organizations and civil society organizations to improve bus stands, building temporary shelters, wherever necessary, improved water delivery systems in public areas and other innovative measures to tackle Heat wave conditions.**
- **Identifying vulnerable populations and the health risks specific to each group.**
- **Developing effective strategies, agency coordination and response planning that addresses heat-health risks.**
- **Heat Health Information Surveillance System (HHISS) to monitor and assess the impact of heat waves on human health.**
- **Reducing Heat Exposure and Promoting Adaptive Measures by launching new efforts including mapping of high-risk areas, access to potable drinking water and cooling spaces during extreme heat days.**
- **Evaluating and updating the Heat Action Plan regularly.**

NDMA and IMD are working with 23 states prone to high temperatures leading to heat-wave conditions to develop heat action plans. Till May 2019 following States are already under Heat Action Plan:

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|-----------------------------|------------------------------|--------------------------|
| 1. Andhra Pradesh | 9. Himachal Pradesh | 17. Punjab |
| 2. Arunachal Pradesh | 10. Jharkhand | 18. Rajasthan |
| 3. Bihar | 11. Jammu and Kashmir | 19. Tamil Nadu |
| 4. Chhattisgarh | 12. Karnataka | 20. Telangana |
| 5. Delhi | 13. Kerala | 21. Uttarakhand |
| 6. Gujarat | 14. Maharashtra | 22. Uttar Pradesh |
| 7. Goa | 15. Madhya Pradesh | 23. West Bengal |
| 8. Haryana | 16. Odisha | |

For supporting the cause, IMD has started Forecast Demonstration Project (FDP) on heat waves from April 2017 for the hot weather season under which a detailed daily report including realized data of heat waves, synoptic situation 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. From April 2018 onwards, 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.

Both these bulletins are posted to IMD website also, on a special page created for heat waves.
