

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
RAJYA SABHA  
UNSTARRED QUESTION No. 23  
TO BE ANSWERED ON MONDAY, FEBRUARY 04, 2019**

**IMPACT OF HEAT WAVES**

**23. SHRIMATI VANDANA CHAVAN :**

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

- (a) whether it is a fact that there has been an increase in heatwaves in the country over the last three years and if so, the details thereof;**
- (b) the reason for the increase in number of heatwaves;**
- (c) details of mechanism used by the Ministry to track heatwaves and changes in temperature that would be classified as a heatwave; and**
- (d) the effects of heatwaves on labour productivity, public health and disaster events?**

**ANSWER**

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

- (a) A recent study shows that heat waves have increased in many parts of the country. In India, the heat wave (HW) conditions are generally experienced during the period from March to July. It has been observed that during the hot weather season (April-May-June), stations from the states of Punjab, Himachal Pradesh, Uttarakhand, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal, Orissa and Telangana and met subdivisions of Marathwada, Vidarbha, Madhya Maharashtra and Coastal Andhra Pradesh experience heat waves and severe heat waves. In the State of Kerala, during the last five years heat wave condition was declared only during April-May 2016 for five days in Palakkad, Kozhikode and Kannur districts.**
- (b) The observed temperatures over most parts of India during last more than hundred years suggest increasing trends in temperatures in line with the global warming. The climate models are suggesting further increase in the temperature due to increased emission of greenhouse gases.**

- (c) **The Regional Meteorological Centres / State Meteorological Centres of IMD provide 7 day forecast of daily maximum temperatures for about 300 cities in India, expanding from 100 cities in 2016. In addition to this, IMD started issuing a Seasonal Outlook for temperatures for the Hot Weather Season (April to June) which is effective in warning the citizens and key groups about the temperature scenario expected during the forthcoming Hot Weather Season.**

**There is no universal definition for Heat Wave (HW). Different definitions of HW are used in different countries. However, a HW over a region represents an interval of hotter than normal weather over the region. HW of relatively higher intensity is classified as severe heat wave (SHW). In India the latest criteria used for defining the HW are based on the climatological values for the period of 1971–2000 and is given below;**

**Criteria for declaring heat wave based on maximum temperature ( $T_{max}$ ):**

**Heat wave over a station is declared only when the actual  $T_{max}$  of the station is 40 °C for plains and 30°C for Hilly regions. However, when the  $T_{max}$  is 40 °C for coastal stations and 45°C for other stations, conditions are declared as heat wave.**

**The following criteria are used for defining severity of the heat wave:**

**When normal  $T_{max}$  is less than or equal to 40 °C and**

- i. Actual  $T_{max}$  is greater than Normal  $T_{max}$  by 5°C / 6°C: heat wave**
- ii. Actual  $T_{max}$  is greater than Normal  $T_{max}$  by 7°C: severe heat wave**

**When normal  $T_{max}$  is greater than 40 °C and**

- i. Actual  $T_{max}$  is greater than Normal  $T_{max}$  by 4°C / 5°C: heat wave**
- ii. Actual  $T_{max}$  is greater than Normal  $T_{max}$  by 6°C: severe heat wave**

**As an adaptive measure, IMD in collaboration with local health departments have started Heat Action Plan (HAP) in many parts of the country to forewarn the heat waves and advising action to be taken during these occasions. For example, Ahmedabad has adopted a heat action plan since 2013. In 2017, 17 cities and 11 states have adopted or are developing heat action plans in India. At the national level, the Indian Meteorological Department (IMD) and the Indian Meteorological Society (IMS) have stepped up with expanded forecasts to over 300 cities.**

**The list of eleven Indian states which have adopted or have developed state-wide Heat Action Plan since 2017 is given below;**

- 1. Odisha**
- 2. Telangana**
- 3. Bihar**
- 4. Maharashtra**
- 5. Gujarat**
- 6. Andhra Pradesh**
- 7. Jharkhand**
- 8. Karnataka**
- 9. Haryana**
- 10. Delhi**
- 11. Uttar Pradesh**

**To guide states on developing HAPs the NDMA had shared a responsibility matrix on how to counter heat wave-related problems. States had the freedom to chart out their plans according to their local context.**

**The Heat Action Plan is a comprehensive early warning system and preparedness plan for extreme heat events. The Plan presents immediate and 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:**

- Building Public Awareness and Community Outreach**
- Utilizing an Early Warning System and Inter-Agency Coordination**
- Capacity Building Among Health Care Professionals**
- Reducing Heat Exposure and Promoting Adaptive Measures**

**(d) The heat waves are one of the disastrous weather events which have their impact on public health. Number of Deaths due to heat waves reported over the country during the period from 2016-2018 is given below:**

<b>Deaths due to Heat wave during since 2010</b>	
<b>Year</b>	<b>Deaths due to Heat wave</b>
<b>2010</b>	<b>269</b>
<b>2011</b>	<b>12</b>
<b>2012</b>	<b>729</b>
<b>2013</b>	<b>1433</b>
<b>2014</b>	<b>548</b>
<b>2015</b>	<b>2081</b>
<b>2016</b>	<b>700</b>
<b>2017</b>	<b>375</b>
<b>2018</b>	<b>20</b>

**It is to be mentioned that due to improved forecasts and Heat Action Plan, the death toll has been reduced during 2016-2018.**

**\*\*\*\*\***