

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 1193
TO BE ANSWERED ON FRIDAY, JUNE 28, 2019**

TRACKING OF HEATWAVE

1193. SHRI SANJAY SETH:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether there has been an increase in heatwaves in the country including Jharkhand over the last three years, if so, the details thereof;**
- (b) the reasons for the increase in the number of heatwaves in the country;**
- (c) the mechanism used by the Government 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 OF STATE IN THE MINISTRY OF HEALTH AND
FAMILY WELFARE
(SHRI ASHWINI KUMAR CHOUBEY)**

- (a) Yes Sir. In India, the heat wave (HW) conditions are generally experienced during the period from March to July. It has been observed that during hot weather season, stations from the north, northwest, central, east India and northeast Peninsula (together called Core HW Zone (CHZ)) are most prone for heat wave (HW) & severe heat wave (SHW) with highest frequency of occurrence during May. The CHZ covers states of Punjab, Himachal Pradesh, Uttarakhand, Delhi, Haryana, Rajasthan, Uttar Pradesh, Gujarat, Madhya Pradesh, Chhattisgarh, Bihar, Jharkhand, West Bengal, Orissa and Telengana and met subdivisions of Marathwada, Vidharbha, Madhya Maharashtra and coastal Andhra Pradesh. Significant increasing trends in the HW days were observed in many stations from CHZ. Many studies indicate that there has been significant increase in heat wave in recent decades over different parts of the country including Jharkhand. The number of Heat wave days observed based on the observatories' data located in Jharkhand follows.**

Year	Jharkhand State		
	No of Heat wave days		
	Daltonganj	Jamshedpur	Ranchi
2016	14	19	16
2017	18	11	9
2018	8	5	0

- (b) The heat wave intensities can be linked to sparser pre-monsoon season rain showers in many areas, as there has been much less moisture than normal of that area, leaving large parts of India arid and dry. This weather pattern, coupled with the El Niño effect, which often increases temperatures in the country, combined to create record high temperatures. The observed temperatures over most parts of India during past 100 years suggest an increasing trend. Latest study also shows an increase in occurrence of heatwaves in many parts of country. The increasing trend in the observed temperatures as well as increasing trend in occurrence of heatwaves are found to be in line with the global warming trends elsewhere over other parts of world. The climate models are suggesting further increase in temperature due to increased emission of greenhouse gases.
- (c) IMD uses temperature data from surface observatories to track heat waves.

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

- (d) A large section of mostly daily wage labourers and others engaged in outdoor work and/ or exposed to indoor heat in Indian cities is more likely to be affected by heat waves. In addition to cities and villages, specific industrial operations (e.g., mining, thermal power, furnace, refineries) emit as well as absorb considerable heat. With the majority of workplace settings in developing countries being heavily influenced by outdoor temperatures, it can be expected that both indoor and outdoor workers will experience increased heat stress. Even relatively modest increase in ambient temperatures could be expected to tip large worker populations over the threshold into the realm of heat stress related health risks and thereby impact the productivity.**

Four Common heat health impacts resulting from excessive exposure to heat waves include dehydration, cramps, exhaustion and heatstroke. It is also learnt that there is a sharp rise in number of cases of acute gastroenteritis and food poisoning due to spoilage of food and reduction of its shelf life due to high temperatures. Alcohol and its fermentation/conversion can also lead to poisoning. There is also rise in number of cases of anxiety, palpitations, nervousness and behavioural change linked to extreme temperature rise. The occupational profile of most of the victims was ascertained as agricultural labourers, coastal community dwellers, and people living below poverty level (BPL) category with mostly outdoor occupations.
