

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**RAJYA SABHA**  
UNSTARRED QUESTION NO.801  
TO BE ANSWERED ON 11.02.2019

**Impact of emission of Green House Gases**

801. SHRIMATI CHHAYA VERMA:  
SHRI VISHAMBHAR PRASAD NISHAD:  
CH. SUKHRAM SINGH YADAV:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether it is a fact that according to the report of the specialists, if the emission of Green House Gases is not checked, the temperature would rise by one degree in the coming years and would lead to increase in disastrous incidents of floods, cyclones, hurricane and storms, etc.;
- (b) the details of occurrences of less or more of rains, floods, hurricanes, storms, cyclones and rise in temperature during last three years; and
- (c) whether it is a fact that due to increase in temperature, the sea level is rising and thereby posing a threat to coastal cities?

**ANSWER**

**MINISTER OF STATE IN THE MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE  
(DR. MAHESH SHARMA)**

(a) The increase of concentrations of greenhouse gases in the atmosphere has led to an increase in the global average surface temperatures. Intergovernmental Panel on Climate Change (IPCC), a body jointly formed by the World Meteorological Organisation and the United Nations Environment Program, periodically assesses the global climate change.

As per the fifth Assessment (AR5) Report of Intergovernmental Panel on Climate Change (IPCC) published in 2014, globally averaged combined land and ocean surface temperature has risen by 0.85 [0.65 to 1.06] °C over the period 1880 to 2012. According to India Meteorological Department (IMD), in line with rising temperatures across the globe, all India mean temperatures have risen nearly 0.66 °C over the period 1901-2017, which is less than the rise in global temperature. All India Summer Monsoon rainfall time series shows no statistically significant trend during the period 1871-2017 though it shows a slight decreasing tendency in the recent three decades. Changes in many extreme weather and climate events like heat waves, heavy precipitation and tropical cyclones have been observed since about 1950. Further IMD studies have highlighted that extreme events like heat waves have risen in the last 30 years. Similarly, trends in extreme rainfall events in last century showed significant positive trend over the west coast and north western parts of peninsula (Maharashtra).

(b) The details of some of the major weather extremes in India in the recent years, as reported under India's Second Biennial Update Report (2018) to the United Nations Framework Convention on Climate Change (UNFCCC) is at Annexure-I.

(c) According to the AR5 Report, the global mean rate of sea level rise was 1.7 mm/year between 1901 and 2010, a total rise of 0.19 meter. Further, as per the studies carried out by Indian National Centre for Ocean Information Services (INCOIS), the sea levels are changing at different rates along the Indian Coast. Sea-level rise may cause increased coastal erosion, more extensive coastal flooding, drowning of low-lying coastal areas and landward intrusion of seawater into estuaries and aquifers.

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## Some of the Major Weather Extreme Events in India (2014-2017)

<b>Temperature</b>			
<b>Year</b>	<b>Month</b>	<b>Event</b>	<b>Details</b>
2014	Jan-Dec	Severe cold wave/cold wave	Cold wave/fog related incidents in northern parts of the country.
	May-Jun	Heat wave	Intense heat wave events which prevailed over northeastern, central and peninsular parts of the country.
2015	May-Jun	Severe heat wave	Severe heat wave incidences over the south peninsula and eastern parts of the country including the States of Andhra Pradesh, Telangana and Odisha.
2016	Mar-May	Severe heat wave	Intense heat wave conditions which prevailed over northeaster, Central and peninsular parts of the country.
2017	Mar-Jun	Severe heat wave	Severe heat wave conditions which prevailed mainly over peninsular parts of the country including Andhra Pradesh and Telangana.
<b>Precipitation</b>			
2014	Mar	Hailstorm	Unprecedented widespread hailstorm in Maharashtra and parts of central India in the first week of March severely affected crops, livestock, animals and birds.
	Sep	Heavy rainfall resulting in floods	Heavy floods in the State of Jammu and Kashmir; Several thousand villages across the state were hit.
2015	Apr-Aug	Nor'wester, Lightening and Heavy rainfall resulting in floods	A severe Nor'wester ravaged 12 districts of Bihar during April. Gujarat State suffered with flood and heavy rains in June. Flood-related incidence also occurred in West Bengal from June to August.
	Nov-Dec	Heavy rainfall	Very heavy rainfall during northeast monsoon season in Tamil Nadu and Andhra Pradesh.
2016	Jul-Sep	Heavy rainfall resulting floods	Heavy rains and floods in State of Maharashtra caused the 'Mahad bridge collapse' incident in August. Flood-related incidences also occurred in 'State of Bihar from 25 <sup>th</sup> July to 3 <sup>rd</sup> September. Cloudburst and landslides also occurred in Uttarakhand in July.
2017	May-Oct	Lightning and Heavy rainfall resulting floods	Lightning and rainfall events caused loss of life in various parts of Odisha from May to October; in Bihar from May to July, and; in Maharashtra in June and October.

	Jul-Sep		Flood and heavy rains caused loss of life in Gujarat. Flood-related incidence, a massive landslide caused deaths at Kotrupi, Himachal Pradesh on 13 <sup>th</sup> August. Floods in Ghaghara, Gomati and Rapti rivers also claimed lives during 4 <sup>th</sup> to 10 <sup>th</sup> September.
<b>Cyclone</b>			
2014	Jun	Cyclonic Storm Nanauk over the Arabian Sea	The storm caused heavy rainfall over Lakshadweep, Kerala and coastal Karnataka.
	Oct	Very Severe Cyclonic Storm, Hudhud, over the Bay of Bengal	Caused human and animal death in north Andhra Pradesh. It caused very heavy rainfall over north Andhra Pradesh and south Odisha and strong gale winds leading to large-scale structural damage over north Andhra Pradesh and adjoining districts of south Odisha.
	Oct	Very severe Cyclonic Storm, Nilofar, over the Arabian sea	Under the influence of system. Konkan and Goa region experienced widespread rain with heavy rainfall at isolated places.
2015	Jun	Cyclonic Storm, Ashobaa, over the Arabian Sea	No adverse weather was reported due to this system.
	Jul	Cyclonic Storm, Komen, over the Bay of Bengal	Loss of life due to cyclonic storm, Komen' in West Bengal and Odisha. Landslides also claimed lives in Manipur.
	Oct	Extremely severe cyclonic storm, Chapala over the Arabian Sea	No adverse weather over west coast of India was reported due to this system.
	Nov	Extremely severe, cyclonic storm, Megh, over the Arabian Sea	No adverse weather over west coast of India was reported due to this system.
2016	May	Cyclonic Storm, Roanu over the Bay of Bengal	It caused adverse weather like heavy rain and strong wind all along east coast of Sri Lanka and India ( including Tamil Nadu, Andhra Pradesh, Karnataka, Rayalseema, Odisha, Gangetic West Bengal, Assam, Meghalaya, Nagaland, Manipur, Tripura)
	Oct	Cyclonic storm Kyant over the Bay of Bengal	The system caused rainfall at isolated places over Tamil Nadu, Puducherry and coastal Andhra Pradesh.
	Nov	Cyclonic storm Nada over the Bay of Bengal	The system caused heavy rainfall at isolated places over Tamil Nadu and Puducherry.

	Dec	Very Severe Cyclonic storm, Vardah over the Bay of Bengal	'Vardah' caused heavy to very heavy rainfall over Andaman & Nicobar Islands. It also caused extremely heavy rainfall over Chennai, Thiruvallur, Kanchipuram districts of Tamil Nadu. It caused human and animal death in Tamil Nadu.
2017	Apr	Cyclonic storm Maarutha over the Bay of Bengal	The system caused heavy rainfall over Andaman & Nicobar Islands.
	May	Severe cyclonic storm 'Mora' over the Bay of Bengal	'Mora' developed in the onset phase of southwest monsoon. The system caused heavy rainfall at isolated places over Arunachal Pradesh, Manipur, Nagaland, Mizoram and Tripura and a few Places over Assam and Meghalaya.
	Nov	Very Severe Cyclonic Storm "Ockhi" over the Bay of Bengal	It was a rare cyclone with rapid intensification after the genesis stage. It caused isolated heavy rainfall over south Tamil Nadu and over south Kerala. It caused heavy to very heavy rainfall over Lakshadweep and heavy rainfall over north coastal Maharashtra and adjoining south coastal Gujarat.