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Reply to the Lok sabha Question Dy. No. 1483 regarding "Crop damage due to Changing Weather".

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a) Whether the sudden change in weather has caused damage to crops and reduction in yields as well as income of farmers;

Yes, sudden changes in weather cause severe damage to crop yields and income of farmers

b) If so, the quantum of losses suffered by farmers due to this reason during each of the last three years and the current year, State-wise;

Clear indications of change in climate are being noticed in the country. Last three decades saw a sharp rise in all India mean annual temperature. Analysis of data for the period 1901-2005 by IMD suggests that annual mean temperature for the country as a whole has risen to 0.51^{o}C over the period. It may be mentioned that annual mean temperature has been consistently above normal (normal based on period, 1961-1990) since 1993. This warming is primarily due to rise in maximum temperature across the country, over a larger part of the data set. However, since 1990, minimum temperature is steadily rising and rate of rise is slightly more than that of maximum temperature.

Aberrations in South-West monsoon which include delay in onset, long dry spells and early withdrawal, all of which affect the crops, strongly influence the productivity levels. Long term data for India indicates that rainfed areas witness 3-4 drought years in every 10-year period. Of these, 2-3 are of moderate and one may be of severe intensity. Although climate change is linked to exacerbation of droughts, so far no definite trend is seen on the frequency of droughts in India based on long term data. The warming trend in India over the past 100 years is estimated to be 0.60^{0} C. The projected impacts are likely to further aggravate yield fluctuations of many crops with impact on food security.

Climate change will have negative effects on irrigated crop yields across regions, including in India both due to temperature rise and changes in water availability, while rainfed agriculture will be primarily impacted due to rainfall variability and reduction in number of rainy day. In India, the impact of climate change on agriculture is expected to be more severe than realized earlier, particularly in crops like wheat. Yield decline are likely to be caused by shortening of growing period, negative impacts on reproduction, grain filling, decrease in water availability and poor vernalization. Biodiversity is also adversely affected which in turn affects agricultural production; this is particularly important to the marginal and small farmers in India. Low organic

carbon, low biological activity and high level soil degradation are common features of dryland regions. Soils in drylands are not only thirsty but also hungry. Wide spread deficiencies of macro and micro nutrients occur due to loss of nutrients through surface soil erosion and inadequate nutrient application.

Yes, National Institute of Disaster Management under the Ministry of Home Affairs, Government of India is publishing the "India Disaster Report" every year based on all the disasters happened in India and also tabulating the losses accumulated to Agriculture and allied sectors besides Human causalities and infrastructure. The ICAR-Indian Agricultural Statistical Research Institute (IASRI) also compiled the information on disasters and crop losses (http://iasri.res.in/agridata//15data%5Cchapter1%5Cdb2015tb1_9.pdf).

Year-wise damage caused due to floods, cyclonic storms, landslides etc. during previous years in India

Year	Cattle Lost (in No.)	Cropped areas affected (in lakh hectares)
2015-16	64230	33.57
2016-17	23554	28.27
2017-18	49168	38.52
2018-19	102502	16.60
Source: Min. of Home Affairs (MHA)		

c) whether this sudden climate change has resulted in heavy rains, hail storms , Cyclones, deficient rains, droughts etc.; and

Yes.

d) If so the details of the areas affected due to such unusual weather pattern?

Year wise Information is provided in the below table

Extreme Weather Events in the last four years (2015- 2018)	
Extreme Events	**Affected areas**
2018	
Flood & Heavy rainfall	Gujarat, Maharashtra, Kerala, Tamil Nadu, Uttar Pradesh, Assam, west Bengal and Odisha
Cold wave	Uttar Pradesh
Snow and avlanche	Jammu & Kashmir
2017	
Flood	Gujarat, South Rajasthan, West Bengal, Assam, Uttar Pradesh, Odisha, Northern Coastal Andhra Pradesh
Hailstorm	Maharashtra, Vidarbha and Central Madhya Pradesh
Drought	Punjab, Haryana, Uttar Pradesh, East Madhya Pradesh and Vidarbha
Cyclone (Ockhi)	Kerala and Tamil Nadu
2016	
Heavy rainfall	Gujarat, Maharashtra, Rajasthan, Andhra Pradesh, Uttarakhand, Assam, Bihar & Madhya Pradesh
Hailstorm	Bihar, Odisha, Madhya Pradesh & Uttar Pradesh
Drought	Uttar Pradesh, Madhya Pradesh, Maharashtra, Odisha
Cyclone (Vardah)	Tamil Nadu
2015	
Heavy rainfall	Tamil Nadu, Andhra Pradesh, Assam, Gujarat, MP, Manipur, Odisha, Rajasthan, WB
Hailstorm	Bihar, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Haryana, Punjab, Uttar Pradesh, Uttrakhand, Himachal Pradesh, J & K, Telangana, Andhra Pradesh, Kerala, West Bengal
Drought	Chhattisgarh, Karnataka, Jharkhand, Odisha, Madhya Pradesh, Maharashtra, Andhra Pradesh, Telangana, Rajasthan
Cyclone	Gujarat