GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 2067
TO BE ANSWERED ON FRIDAY, NOVEMBER 29, 2019

WINTER FORECAST BY IMD

2067. SHRI BIDYUT BARAN MAHATO:
SHRI PRATAPRAO JADHAV:
SHRI GAJANAN KIRTIKAR:
SHRI SUDHEER GUPTA:
SHRI SANJAY SADASHIV RAO MANDLIK:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether the India Meteorological Department (IMD) proposes to issue a winter forecast and cold wave alerts for current winter season, if so, the details thereof;
(b) whether the Meteorological Department has also predicted the fog conditions in the country;
(c) if so, the details thereof, State/ UT-wise;
(d) if not, the reasons for the delay, along with the accuracy rate achieved by the IMD in making predictions during each of the last three years; and
(e) the steps taken/being taken by the Government to increase the efficiency and accuracy rate in this regard?

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

(a) Yes Sir, as per practice, India Meteorological Department will be issuing the seasonal temperature outlook for the current winter season and it will be released by the end of November 2019.

In addition to seasonal outlook, IMD also issues weekly cold wave alerts and warnings once in every week valid for next 4 weeks. These forecasts are made available through IMD, Delhi website (www.imd.gov.in)

(b)&(c) The National Weather Forecasting Centre, IMD, New Delhi issues five days forecast and warnings in sub-division scale. These forecasts are updated four times a day and serve as a guidance bulletin for the State/Regional Meteorological offices. The State/Regional Meteorological offices in turn issue forecast and warnings in the district level. IMD monitors & issues forecasts and warnings for the

occurrence of fog along with its intensity as and when required and these warnings are included in the daily weather bulletins.

(d) The verification of fog forecast for the last four seasons is given in Annexure.

(e) From 2016-2017, IMD started a Forecast Demonstration Project (FDP) for winter weather systems and the same is conducted during the period from 1st December to 28 February. It takes care of the prediction of weather associated with winter weather systems like rainfall/ snowfall, fog, cold wave and ground frost.

It is an integrated national campaign including IMD and other institutes like National Centre for Medium Range Weather Forecasting (NCMRWF), Indian Institute of Tropical Meteorology (IITM), Indian Air Force (IAF), Space Application Centre (SAC), etc. The various units of IMD like National Weather Forecasting Centre (NWFC) and the Satellite Meteorological division of IMD headquarters, Regional Weather Forecasting Centres and State Weather Forecasting Centres, Met. Watch offices and Aviation Meteorological offices under RMC New Delhi, RMC Kolkata & RMC Guwahati participate in this campaign. Based upon the inputs from all, NWFC, IMD, New Delhi issues a daily guidance bulletin for winter weather systems which include current observations, details of past weather, synoptic features, thermodynamic & dynamic features from NWP models with summary and conclusions beneficial for monitoring & prediction. Significant improvement in prediction of winter weather systems including fog had been observed after the commencement of FDP.

In an effort to gain insight into the occurrence of fog, the Ministry of Earth Sciences (MoES), Government of India has taken up a multi-institutional initiative Winter Fog Experiment (WIFEX) to conduct an intensive ground based measurement campaign at the India Gandhi International Airport (IGIA), Delhi, to understand different physical and chemical features of fog and factors responsible for its genesis, intensity and duration. WIFEX was conducted in a pilot mode at IGIA during winter season 2015-16 and is being continued during the period from December to February in the following years. The main scientific objective of this project is to study the characteristics and variability of fog events and associated dynamics, thermodynamics and fog micro physics, with the aim to achieve better understanding of fog life cycle and ultimately improve capability in fog prediction. In addition to Indian Institute of Tropical Meteorology (IITM), Pune, IMD, Centre for Medium Range Weather Forecasting (NCMRWF), Airport Authority of India, GMR, IGIA and Indian Institute of Science

Education and Research (IISER) Mohali and also participating in this observational campaign.

Annexure

Verification of Fog forecast (All India) for the last four seasons:

All India	FAR			MR			CSI			POD		
	D1	D2	D3	D1	D2	D3	D1	D2	D3	D1	D2	D3
2018-19	.05	.04	.04	.62	.72	.86	.22	.17	.09	.38	.28	.14
2017-18	0.15	0.17	0.13	0.16	0.24	0.36	0.64	0.57	0.51	0.84	0.76	0.64
2016-17	0.12	0.12	0.06	0.39	0.52	0.72	0.47	0.36	0.24	0.61	0.48	0.28
2015-16	0.18	0.17	0.05	0.50	0.57	0.87	0.33	0.3	0.11	0.50	0.43	0.13

FAR – False Alarm Rate; MR – Missing Rate; CSI – Critical Success Index; POD – Probability of Detection (%)

Average error of fog forecasting for 2015-19

Lead Time of warning issued	FAR	MR	CSI	POD
24 hours	0.05	0.42	0.40	0.58
48 hours	0.05	0.51	0.34	0.49
72hours	0.03	0.70	0.24	0.30

- **In General, large scale dense fog was predicted 3 to 5 days in advance.**
- **Attempt was also made to provide the timing of intense fog spell.**
- **Provided information to various users including Indian Railway and Medical Association.**
- **During 2018-19, there was very less occurrence of prolonged spells of dense fog. Most of dense fog episodes were for 2-3 hours only.**