

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 3353
TO BE ANSWERED ON WEDNESDAY, 23RD MARCH, 2022**

INACCURATE WEATHER FORECAST

3353. SHRI CHANDESHWAR PRASAD:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether monsoon was not as per the forecast made by the Indian Meteorological Department (IMD) in the country;
- (b) if so, the details thereof;
- (c) the reasons as to why weather forecast by the IMD often go wrong; and
- (d) the details of the corrective steps taken in this regard?

ANSWER

THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

- (a)-(b) No, Sir. Progress of the monsoon in the country was very well predicted by the India Meteorological Department (IMD). In this regard Press releases were regularly issued by IMD.

Pointwise details follow:

- i. Southwest Monsoon Set in over South Andaman Sea and over some parts of north Andaman Sea on 21st May 2021. Monsoon onset over Kerala occurred 3rd June 2021.
- ii. Southwest Monsoon continued its advance over the country till 13th June in association with favourable atmospheric circulation and a low pressure system over Bay of Bengal after the onset of monsoon over Kerala on 3rd June.
- iii. By 13th June, it covered most parts of the country except northwest India. On 13th June, Numerical weather prediction (NWP) models suggested the favourable conditions with moist lower level easterly winds reaching to northwest India which may help further advance of monsoon into most parts Madhya Pradesh; remaining parts of Uttar Pradesh; Delhi; Haryana and Punjab during subsequent 48 hours. Accordingly, a press release was issued by 13th June indicating likely advance of monsoon into Delhi by 15th June.
- iv. On 14th June, however, weather analysis based on satellite and NWP model consensus indicated approach of a trough in mid- latitude westerly winds, leading to weakening of easterly winds over northwest India. Due to adverse influence of this mid-latitude westerly winds, further advance of monsoon into remaining parts of northwest India including Delhi was not expected. Accordingly, IMD issued an updated press release on 14th June indicating that further advance of southwest Monsoon into remaining parts of northwest India including Delhi would be slow and delayed". However, this development of interaction with westerlies could not be anticipated by the weather prediction models well in advance.

- v. On 16th June, another press release was immediately issued indicating delay in monsoon advance into Delhi and slow progress into some parts of northwest India. Accordingly monsoon advanced into some more parts of northwest India by 19th June.
- vi. Since 20 June, there was no further advance of monsoon due to weak/break monsoon conditions. Regular press releases were issued and updated to media from time to time on 22, 24, 26 and 30 June and 1 July indicating such delays in monsoon advance into remaining parts of northwest India including Delhi and weak/break monsoon conditions over the country. The delay in monsoon advance was mainly due to (i) no formation of low pressure area over Bay of Bengal, (ii) No presence of monsoon trough at mean sea level near to Delhi, (iii) 5-6 Western disturbances moved west to east across North India which dominated over the monsoon easterlies.
- vii. On 5th July, updated press release on Status of monsoon was issued indicating that monsoon would advance into remaining parts of West Uttar Pradesh, some more parts of Punjab, Haryana and Rajasthan and Delhi around 10th July.
- viii. After 8th July, easterly winds at lower levels were established along the foothills and from 9th July onwards easterly winds were established over planes of Northwest India. These moisture laden easterly winds led to increase in cloudiness and relative humidity. It also led to revival of monsoon over the region and occurrence of fairly widespread/widespread rainfall activity over east Rajasthan, HP, Uttarakhand, J&K and scattered rainfall over Punjab and west Rajasthan. However, it did not cause significant rainfall activity over Delhi even though, there was rainfall activity over neighbouring places around Delhi. Such type of failure by numerical models in prediction of monsoon advance over Delhi is rare and uncommon. It is needless to mention that IMD predicted well with high accuracy about the advance of monsoon over Delhi in the recent past years and also the advance of monsoon over different parts of the country during the monsoon -2021 accurately about four to five days ahead. IMD monitored the situation continuously and provided the regular updates on advance of monsoon into remaining parts of northwest India including Delhi.
- ix. The southwest monsoon further advanced into remaining parts of the country including Delhi, remaining parts of Uttar Pradesh, Punjab, Haryana and Rajasthan and thus the Southwest Monsoon covered entire country on 13th July, against the normal date of 08th July (Figure).
- x. Seasonal forecasts were issued on 1st June to the four broad geographical regions of India viz. Northwest India, Central India, Northeast India and South Peninsula. The season as a whole were normal (92-108% of LPA), above normal (>106% of LPA), below normal (<95% of LPA) & normal (93-107% of LPA), respectively. The newly introduced seasonal rainfall over Monsoon Core Zone (MCZ) was forecasted to be above normal (>106% of LPA). And the actual observed rainfall over Northwest India, Central India, Northeast India, South Peninsula and Monsoon Core Zone were 96%, 104%, 88%, 111% and 107 % of the Long Period Average (LPA), respectively.

(c) Does not arise.

- (d) IMD follows a seamless forecasting strategy. The long-range forecasts (for the whole season) issued are being followed with extended range forecast issued on every Thursday with a validity period of four weeks. To follow up the extended range forecast, IMD issues short to medium range forecast and warnings at 36 meteorological sub-divisions levels daily four times by the National Weather Forecasting Centre (NWFC), New Delhi valid up to next five days with an outlook for subsequent two days. The short to medium range forecast and warning at district and station level are issued by state level Meteorological Centres (MCs)/Regional Meteorological Centres (RMCs) with a validity of next five days and are updated twice a day. The short to medium range forecast is followed by very short range forecast of severe weather up to three hours (nowcast) for all the districts and 1085 cities and towns. These nowcasts are updated every three hours.

While issuing the warning suitable colour code is used to bring out the impact of the severe weather expected and to signal the Disaster Management about the course of action to be taken with respect to impending disaster weather event. Green colour corresponds to no warning hence no action is needed, yellow colour corresponds to be watchful and get updated information, orange colour to be alert and be prepared to take action whereas red colour signals to take action.

IMD is issuing Impact Based Forecast (IBF) which give details of what the weather will do rather than what the weather will be. It contains the details of impacts expected from the severe weather elements and guidelines to general public about do's and don'ts while getting exposed to severe weather. These guidelines are finalised in collaboration with National Disaster Management Authority (NDMA) and is already implemented successfully for cyclone, heat wave, thunderstorm and heavy rainfall. Work is in progress to implement the same for other severe weather elements.

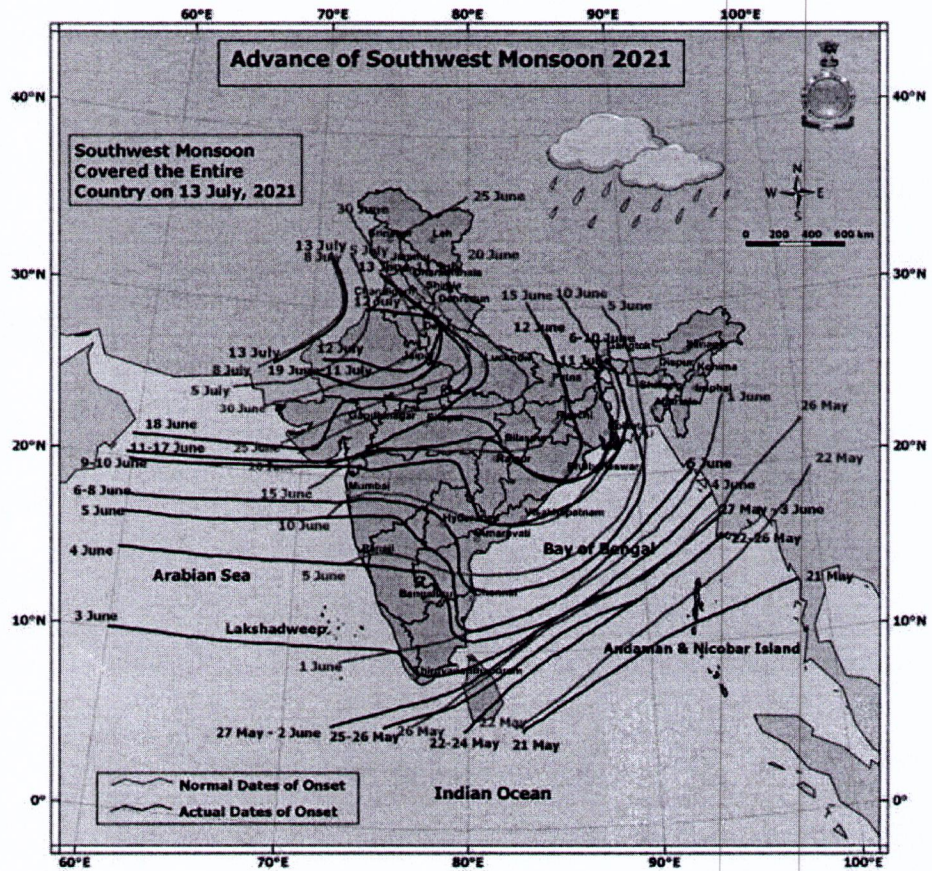


Figure: Advancement of Southwest Monsoon over the country and their normal dates
