

Weather on Independence Day at the important cities of India

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1. Introduction

Independence Day, 15 August 1947, is a land mark in the history of India. It is only natural that the people of India should rejoice and celebrate with enthusiasm each year the anniversary of this historic day. 15 August falls during the peak period of the southwest monsoon, a season of rain and cloudy skies. The organisers and participants in the celebrations, which are held even in the smallest village, have one question uppermost in their mind. What is the weather going to be and will it rain? It is the purpose of this note to present an analysis, from past records, of the weather on this day at the important cities of India. It is expected that from the analysis of the data it will be possible to obtain a fair idea of the probability of rain and cloudiness on Independence Day.

2. Seasonal features

Independence Day comes when the southwest monsoon has established over the whole country. As is well known, spells of abundant rainfall alternate with spells of scanty rainfall. This pulsatory character of rain and cloudiness is associated with the variations in the synoptic situation. The spells of abundant rainfall and cloudy skies are associated with the intensification of the monsoon trough and the formation and movement of depressions and storms over the north Bay of Bengal and their movement westnorthwestwards across the Gangetic valley. When the monsoon trough lies to the north of its normal position and close to the foot of the Himalayas the rainfall over most part of the country is scanty

and the skies are lightly clouded while abundant and locally heavy rainfall occurs along and near the foot Himalayas particularly, over the eastern end.

3. Sources of data

The rainfall, cloud amount and weather data were collected from the *Indian Daily Weather Report* and Monthly Meteorological Registers. In some cases when the M.M.Rs were not available the rainfall data were supplemented from the data of state rain-gauges given in the volumes of the *Daily Rainfall of India*. The recording of the evening observations as a routine commenced in 1931. The rainfall recorded during the preceding 24 hours ending on the morning of 16 August was collected for the 50 years period from 1907 to 1956 for some of the important cities of India. Though strictly not valid, this rainfall has been taken as having occurred on the 15th for the present analysis. During the 50-year period the hour of observations of rainfall and cloud in the morning has been changed, from time to time, from 0800 local time to 0800 IST and since 1949 to 0830 IST. There has been a similar and simultaneous change of half an hour in the time of the evening observations which are now taken at 1730 IST. It is not, however, expected that this variation in the time of recording rainfall and cloudiness will affect the statistics materially.

4. Rainfall on 15 August

The rainfall that occurred on this day at 23 cities in India is summarised in Table 1.

It will be noticed from this table that no station has been free from rain nor is there

TABLE 1
Number of occasions of rainfall recorded at 0800 IST of 16 August
during the period 1907—1956 (50 years)

Station	Occasions with rainfall					
	Nil		.01 - .10"		> .10"	
	Total No.	%	Total No.	%	Total No.	%
Ahmedabad	24	48	7	14	19	38
Allahabad	23	46	6	12	21	42
Bangalore	20	40	13	26	17	34
Bhopal*	19	39	13	26	17	35
Bombay	3	6	22	44	25	50
Calcutta	9	18	12	24	29	58
Cuttack	17	34	5	10	28	56
Gwalior	25	50	10	20	15	30
Hyderabad	28	56	8	16	14	28
Indore	16	32	14	28	20	40
Jaipur	25	50	13	26	12	24
Jodhpur	35	70	4	8	11	22
Kurnool	35	70	7	14	8	16
Lucknow	25	50	6	12	19	38
Madras	24	48	13	26	13	26
Nagpur	15	30	14	28	21	42
New Delhi	29	58	8	16	13	26
Patna	21	42	11	22	18	36
Poona	10	20	28	56	12	24
Shillong	12	24	13	26	25	50
Simla	4	8	14	28	32	64
Srinagar*	30	62	13	26	6	12
Trivandrum	24	48	13	26	13	26

* Data were available for only 49 years

a station at which rain occurred on each and every '15 August', of the 50 years examined. Bombay and Simla have very low percentage frequency of rainless days namely, 6 and 8 respectively. Calcutta, Poona, and Shillong have 18, 20 and 24 per cent of such days respectively. At the other extreme, we have Jodhpur and Kurnool with 70 per cent rainless days each, and Srinagar with 60 per cent. The other cities have a percentage frequency varying between 30 and 58. Rainfall is a general feature of the monsoon and any rain upto 10 cents (2.5 mm) is not likely to affect the outdoor celebrations. We may, therefore, consider the number of occasions of rain of more than 10 cents (2.5 mm) separately. We find

that this rainfall has occurred on less than 35 per cent of the occasions at Bangalore, Bhopal, Gwalior, Hyderabad, Jaipur, Jodhpur, Kurnool, Madras, New Delhi, Poona, Srinagar and Trivandrum; between 35 and 50 per cent of occasions at Ahmedabad, Allahabad, Bombay, Indore, Lucknow, Nagpur and Shillong. The frequency of occurrence of rain greater than 10 cents is more than 50 per cent at Calcutta, Cuttack, Patna and Simla, the highest frequency of 64 per cent being at Simla.

As most of the celebrations are held during the daylight hours the frequency of rain between 8 A.M. in the morning and 5 P.M. in the evening will be of interest. The

TABLE 2
Number of occasions of rainfall recorded between 0800 and 1700 IST of 15 August during the period 1934—1956 (23 years)

Station	No. of years	Occasions with rainfall					
		Nil		.01 - .10"		>0.10"	
		Total No.	%	Total No.	%	Total No.	%
Ahmedabad	23	15	65	7	30	1	4
Allahabad	23	16	70	4	17	3	13
Bangalore	23	16	70	4	17	3	13
Bhopal	23	13	51	3	13	7	30
Bombay	23	9	39	8	35	6	26
Calcutta	23	9	39	6	26	8	35
Cuttack	22	7	32	6	27	9	41
Gwalior	17	9	53	5	29	3	18
Hyderabad	20	15	75	3	15	2	10
Indore	23	12	52	4	17	7	30
Jaipur	23	12	52	7	30	4	17
Jodhpur	23	18	78	4	17	1	4
Kurnool	20	18	90	0	0	2	10
Lucknow	22	14	64	2	9	6	27
Madras	23	22	96	1	4	0	0
Nagpur	23	14	61	7	30	2	9
New Delhi	23	12	52	6	26	5	22
Patna	23	14	61	5	22	4	17
Poona	23	11	48	11	48	1	4
Shillong	23	15	65	3	13	5	22
Simla	23	5	22	6	26	12	52
Srinagar	22	19	86	2	9	1	5
Trivandrum	23	18	78	3	13	2	9

rainfall recorded between the morning and evening observations is available for most of the stations since 1934. The rainfall that was recorded between the morning and evening observations on 15 August from 1934 to 1956 has been summarised in Table 2.

This table shows that during the 23-year period Madras has been almost free from rain during the day, there being only one occasion of very light rain. A rainfall of more than 10 cents (2.5 mm) has occurred on about 50 per cent of the occasions at Simla, and on 30 to 40 per cent at Bhopal,

Calcutta, Cuttack and Indore. For the remaining cities the frequency is less than 30 per cent. Thus the possibility of any appreciable rain during the day, likely to affect the celebrations seriously, is very small for most of the cities.

The frequency of heavy rain (3 inches i.e., 7.5 cm, and more) during the 24-hour period ending on the morning of 16 August was also looked into. During the 50-year period there have been two occasions of heavy rain at Cuttack and one each at Allahabad, Gwalior, Kurnool, Lucknow, Nagpur, Patna, Simla and Trivandrum,

TABLE 3
Weather on 15 August

Station	Weather at about 0800 IST			Weather at about 1700 IST		
	No. of years	Occasions with drizzle, rain or thundershowers		No. of years	Occasions with drizzle, rain or thundershowers	
		Total No.	%		Total No.	%
Ahmedabad	50	7	14	23	6	26
Allahabad	50	8	16	23	5	22
Bangalore	50	3	6	23	3	13
Bhopal	26	7	27	23	4	17
Bombay	50	15	30	23	8	35
Calcutta	50	5	10	23	9	39
Cuttack	50	8	16	22	7	32
Gwalior	17	1	6	17	6	35
Hyderabad	50	9	18	19	2	11
Indore	50	11	22	23	8	35
Jaipur	50	4	8	23	7	30
Jodhpur	50	1	2	23	3	13
Kurnool	50	2	4	20	2	10
Lucknow	50	3	6	23	3	13
Madras	50	4	8	22	6	27
Nagpur	50	8	16	23	3	13
New Delhi	50	7	14	23	3	13
Patna	50	8	16	23	4	17
Poona	50	13	26	23	7	30
Shillong	50	15	30	23	8	35
Simla	50	9	18	23	10	43
Srinagar	46	3	7	19	1	5
Trivandrum	50	4	8	23	1	4

Fog occurred on one occasion each at Ahmedabad and Shillong and on 11 occasions at Simla

4. Weather

On this day of National importance the people are usually eager to start the celebrations from dawn itself. Information about the weather that has occurred at the time of the morning observation and one hour preceding it, is available for the entire period from 1907 to 1956. The information of weather at the time of the evening observation is available for most of the stations from 1934 to 1956. The data for the morning and evening observations have been summarised in Table 3. The table shows that at most of the stations drizzle, rain or thundershowers are more frequent in the evening than in the morning.

Since 1950 the weather that has occurred during the period 0530 to 0830 IST on 15 August is available in the *Indian Daily Weather Reports*. The data for the period 1950-1956 show that drizzle, rain or thundershowers occurred on one occasion at Ahmedabad, Gwalior, Hyderabad, Indore, Jaipur, Jodhpur, Kurnool, Madras, Patna and Shillong; on two occasions at Allahabad and Calcutta; on three occasions at Bangalore, Lucknow, Nagpur and Trivandrum; on four occasions at Bhopal, Bombay, Poona and Simla; and on 6 out of the 7 occasions at Cuttack. New Delhi and Srinagar were free from weather during morning hours on all the 7 occasions.

TABLE 4
Percentage frequency of occasions with different amounts of cloud coverage
at about 0800 IST on 15 August

Station	No. of years	Percentage frequency with different amounts of cloud coverage					
		Clear	1 or 2 oktas	3-5 oktas	6 or 7 oktas	Overcast	6-8 oktas
Ahmedabad	50	—	4	26	16	54	70
Allahabad	50	—	2	28	20	50	70
Bagalore	50	—	8	4	34	54	88
Bhopal	28	—	4	7	32	57	89
Bombay	50	—	—	10	42	48	90
Calcutta	50	—	4	24	24	48	72
Cuttack	50	—	4	18	36	42	78
Gwalior	17	—	—	—	41	59	100
Hyderabad	49	2	10	4	49	35	84
Indore	50	—	2	4	30	64	94
Jaipur	50	8	12	18	42	20	62
Jodhpur	49	—	12	20	33	35	68
Kurrool	50	2	10	16	26	46	72
Lucknow	50	6	14	22	28	30	58
Madras	50	4	20	16	18	42	60
Nagpur	50	2	—	20	50	28	78
New Delhi	50	18	4	22	38	18	56
Patna	49	—	2	18	35	45	80
Poona	50	2	2	22	38	36	74
Shillong	50	—	2	14	36	48	84
Simla	50	2	6	12	22	58	80
Srinagar	46	27	20	20	20	13	33
Trivandrum	50	4	4	20	24	48	72

Occasions of fog with sky obscured have been taken as overcast

5. Cloudiness

Cloudiness is another element of interest on this day. Data for cloudiness at the time of the morning observation were available for most of the stations in the *Indian Daily Weather Report* for the 50 years 1907-1956. Data for the evening hour of observation have been included in the above report since 1944. The cloud amount data for the years 1931-1943 were collected from the M.M.Rs of the stations.

The percentage frequencies of occasions with different amount of cloud coverage at 0800 IST and 1700 IST are given in Tables

4 and 5 respectively. A comparison of the tables shows that the frequency of clear or lightly clouded skies is only slightly in excess in the morning, Srinagar having the highest frequency of nearly 50 per cent. In the cases of the cloud amounts 6 oktas and more there is no appreciable difference in the frequency at the times of the two observations. The average cloudiness for the day for the period 1931 to 1956 was also examined. It was found that except for Allahabad, Jodhpur, Lucknow, Srinagar and Trivandrum the remaining stations have on this day, an average cloud amount of 6 oktas or more on more than 70 per cent of the occasions.

TABLE 5
Percentage frequency of occasions with different amounts of cloud coverage
at about 1700 IST on 15 August

Station	No. of years	Percentage frequency with different amounts of cloud coverage					
		Clear	1 or 2 oktas	3-5 oktas	6 or 7 oktas	Overcast	6-8 oktas
Ahmedabad	26	—	—	30	35	35	70
Allahabad	26	—	8	27	23	42	65
Bangalore	25	—	—	20	40	40	80
Bhopal	26	—	4	15	39	42	81
Bombay	26	—	4	15	39	42	81
Calcutta	26	—	—	23	50	27	77
Cuttack	26	—	—	8	50	42	92
Gwalior	17	—	6	6	53	35	88
Hyderabad	19	—	—	21	32	47	79
Indore	26	—	4	27	27	42	69
Jaipur	26	4	4	11	46	35	81
Jodhpur	23	4	—	22	48	26	74
Kurnool	19	—	—	26	26	48	74
Lucknow	25	—	20	20	28	32	60
Madras	26	—	4	15	31	50	81
Nagpur	26	—	4	11	50	35	85
New Delhi	24	—	8	25	50	17	67
Patna	26	—	8	31	42	19	61
Poona	25	—	—	16	68	16	84
Shillong	26	—	8	8	30	54	84
Simla	26	4	—	4	61	31	92
Srinagar	19	5	37	26	21	11	33
Trivandrum	26	—	4	27	31	38	69

Allahabad, Jodhpur, Lucknow and Trivandrum have frequencies between 60 and 70 per cent while Srinagar has the lowest frequency of 40 per cent.

6. Summary

The main features which emerge from this study of weather on 15 August are—

(i) Rain is less frequent during the day time than at night.

(ii) The chance of rain during the period from dawn to dusk are about 50 per cent at Simla, between 30 and 40 per cent at Bhopal, Calcutta, Cuttack and Indore and less than 30 per cent at the remaining stations.

(iii) The chances of rain in the evening is greater than in the morning at all the stations.

(iv) On more than 70 per cent of the occasions the sky is likely to be covered with clouds 6 oktas or more at all the stations except Srinagar, where the chances of such a clouded sky is only about 30 per cent.

The above are the conclusions that can be drawn from a climatological study and will represent the expectancy of weather on 15 August of any year.

7. Acknowledgement

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