भारत सरकार

Government of India

पृथ्वी विज्ञान मंत्रालय

(एम. ओ. ई. एस.)

Ministry of Earth Sciences (MoES)

भारत मौसम विज्ञान विभाग

INDIA METEOROLOGICAL DEPARTMENT

Climate Research and Services (CRS)

Climate Summary for the month of February 2024

1. Monthly Rainfall Scenario (February 2024)

Rainfall over the country as a whole for the month of February 2024 shows that it has recorded 19.7 mm rainfall which is 13% less than its Long Period Average (LPA) 22.7 mm.

Daily variation of the rainfall over the country as a whole during the month of February 2024 with normal (1971-2020) and All India rainfall percentage departure from normal for February during 1901-2024 is shown in the figure 1(a) and 1(b) respectively. The rainfall over south peninsular India during February 2024 was 0.7 mm and which was 15th lowest since 1901 and 4th lowest since 2001 (fig 1(c)).

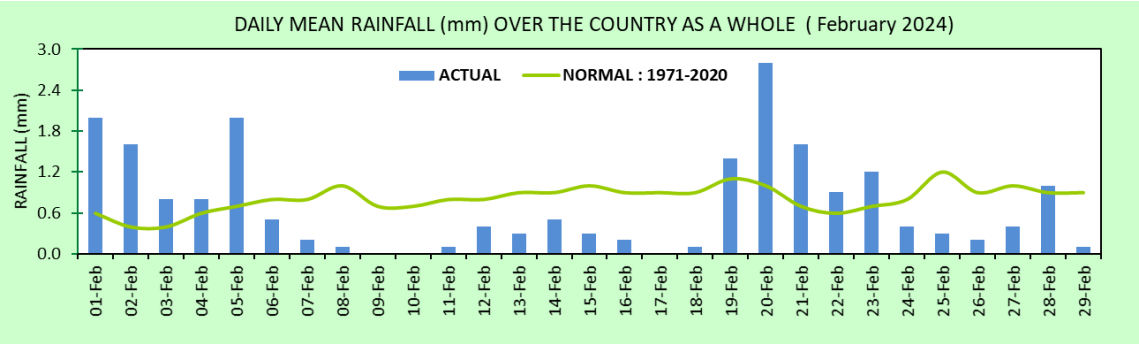


Fig.1 (a): Daily variation of rainfall over the country as a whole during February 2024

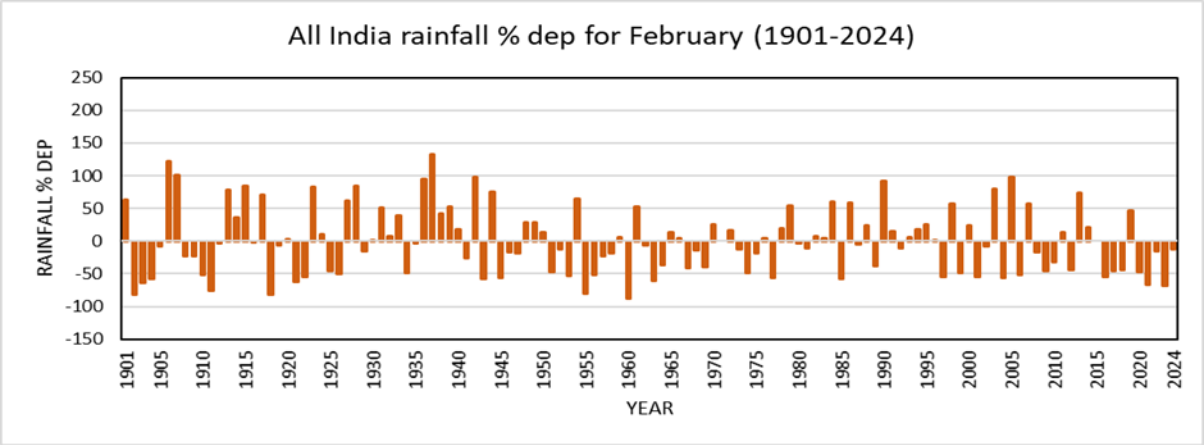


Fig 1(b). All India monthly rainfall percentage departure from normal (1971-2020) for February from 1901-2024.

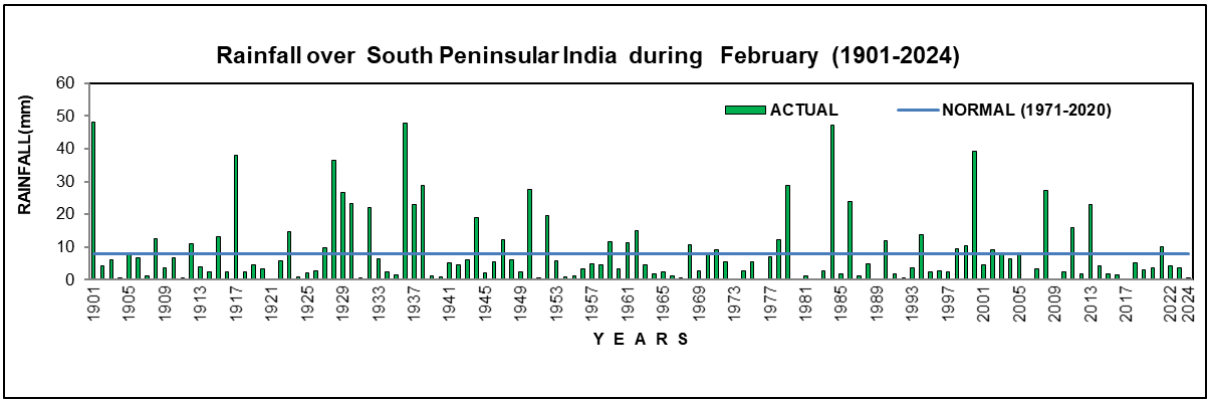


Fig 1(c). The average monthly rainfall over the South Peninsular India expressed in percentage departure from normal (1971-2020) for February from 1901-2024.

The monthly rainfall for **February 2024** is given in the table below:

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	**19.7**	**22.7**	**-13.0**
Northwest India	**39.3**	**44.9**	**-13.0**
Central India	**6.1**	**7.5**	**-18.0**
South Peninsula	**0.7**	**7.9**	**-91.0**
East & northeast India	**33.8**	**30.0**	**13.0**

During this month, one sub division (Jharkhand) received large excess, 3 received excess, 12 normal, 7 received deficient, 7 received large deficient rainfall and 6 sub divisions did not receive any rain. Fig 2 shows Subdivision-wise rainfall distribution for February 2024.

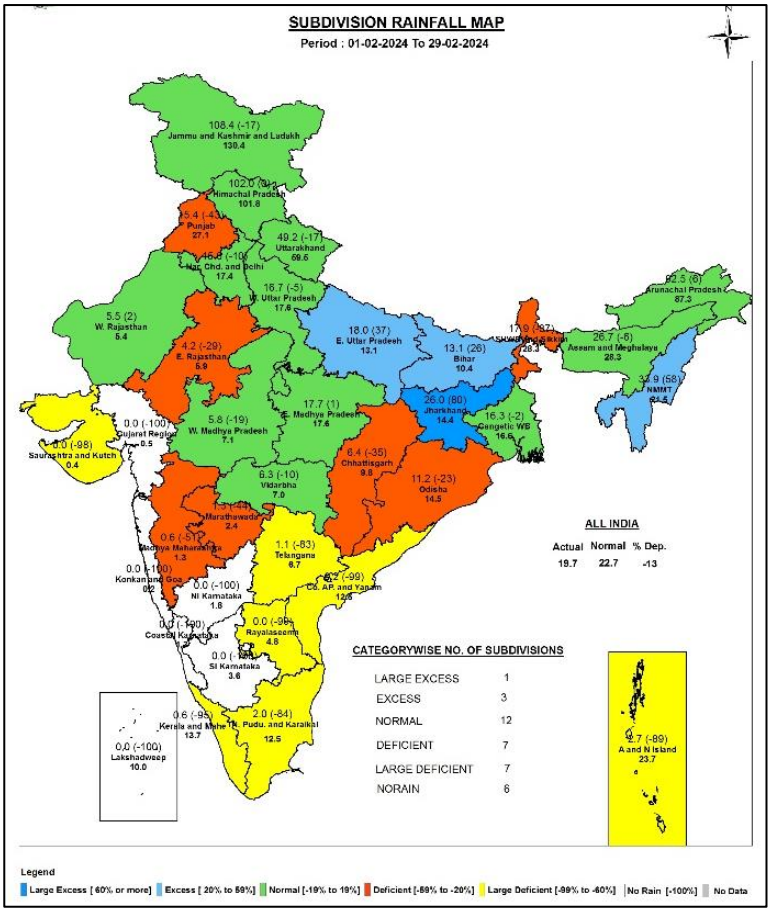


Fig 2: Subdivision-wise rainfall distribution for February 2024.

The observed spatial distribution of rainfall during February 2024, normal rainfall based on data of 1971 to 2020 and rainfall departures from normal during February 2024 are given in Fig.3.

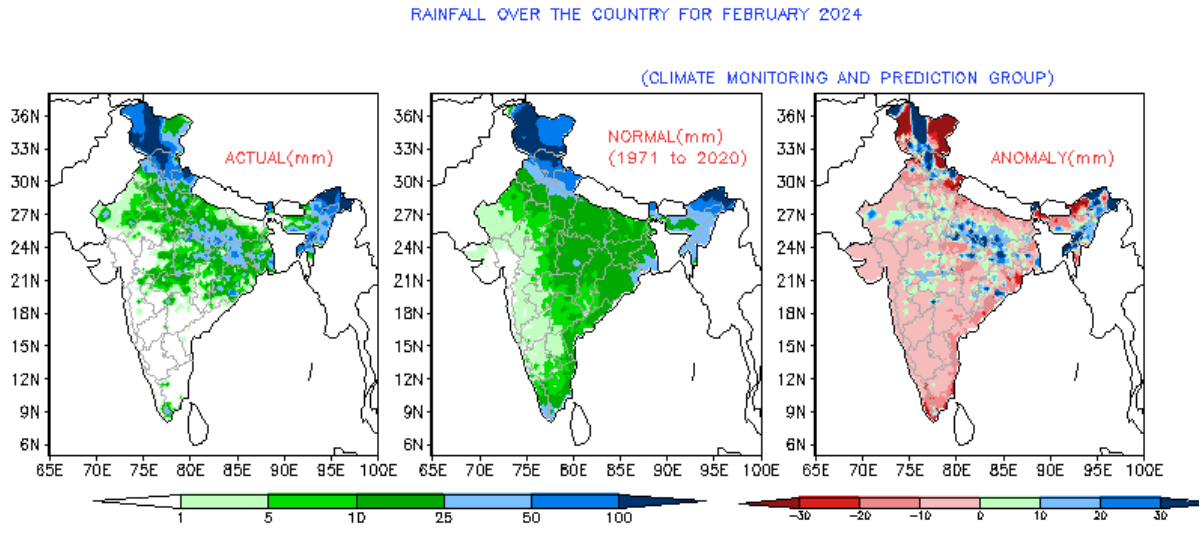
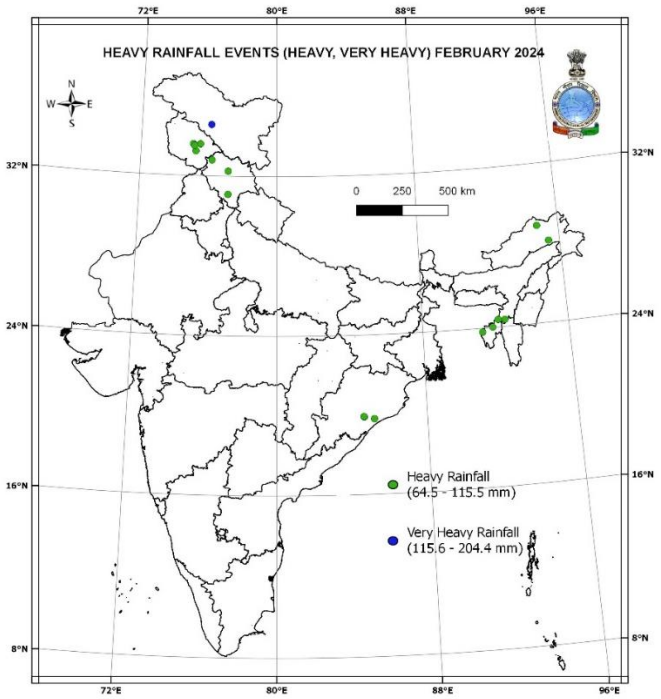


Fig 3: Observed spatial Rainfall pattern for the month of February 2024 over India and their departure from normal (1971 to 2020 period).

2. Heavy Rainfall events during February 2024.

On 20th February 2024 witnessed very heavy rainfall (184.6 mm) over Kargil station in Jammu & Kashmir & Ladakh, In February 2024 many other stations are also reported heavy rainfall events (64.5 – 115.5 mm of rainfall) mainly over Arunachal Pradesh, Odisha, Tripura, Himachal Pradesh and Punjab. The location of occurrences of heavy and very heavy rainfall events is shown in the Figure 4.

Out of total 16 stations, 1 station reported very heavy rainfall (115.6 to 204.4 mm) and 15 stations reported heavy rainfall (64.5 to 115.5 mm of rainfall) during this month.



(Only highest category of rainfall event considered for a station)

Fig 4: The location of occurrences of heavy rainfall events in the month February 2024.

3. Chief Synoptic weather features observed during February 2024.

A total of 8 number of WD (30 Jan-2 Feb, 3-8 Feb, 12-19 Feb, 18-22 Feb, 22-24 Feb, 23-27 Feb, 26-28 Feb and 28 Feb.-1 March) caused Rain / snow over western Himalayan States (Jammu-Kashmir-Ladakh-Gilgit-Baltistan-Muzaffarabad, Himachal Pradesh and Uttarakhand) for 1-3 days. Out of 8 WDs, 6 WDs were active and caused rain/Thunder storms and hail storm over plains of north and central India.

A North-South Trough in easterlies observed at lower levels over central India with wind incursion from anti-cyclonic circulation over Bay of Bengal observed during most of the dates in the 2nd half of Feb 2024 caused rainfall and thunderstorms with isolated hailstorm over central India and eastern parts of India on many days.

Due to trough in westerly and support from lower level winds with moisture incursions from North Bay of Bengal, heavy rainfall/Snowfall was recorded at isolated

places on isolated days during 22-24 Feb. over Sikkim, Arunachal Pradesh and Assam & Tripura.

4. Characteristics of Temperatures for the month of February 2024

The average maximum, average minimum and mean temperature for the country as a whole during February 2024 were 27.59ºC, 14.61ºC and 21.10ºC respectively, against the normal of 27.58ºC, 13.82ºC and 20.70ºC based on period of 1991-2020. Thus, the average minimum temperature and mean temperature were above normal by 0.79ºC, 0.40ºC respectively except the average maximum temperature was normal by 0.01ºC for the country as a whole. The climatological data based on the period of 1991 to 2020 are used to calculate the normal and hence the anomaly (Actual average temperature in 2024 - normal temperature based on data of 1991-2020). The daily variation of maximum and minimum temperature anomaly over the country as a whole for February 2024 is shown in the figure 5(a) and (b).

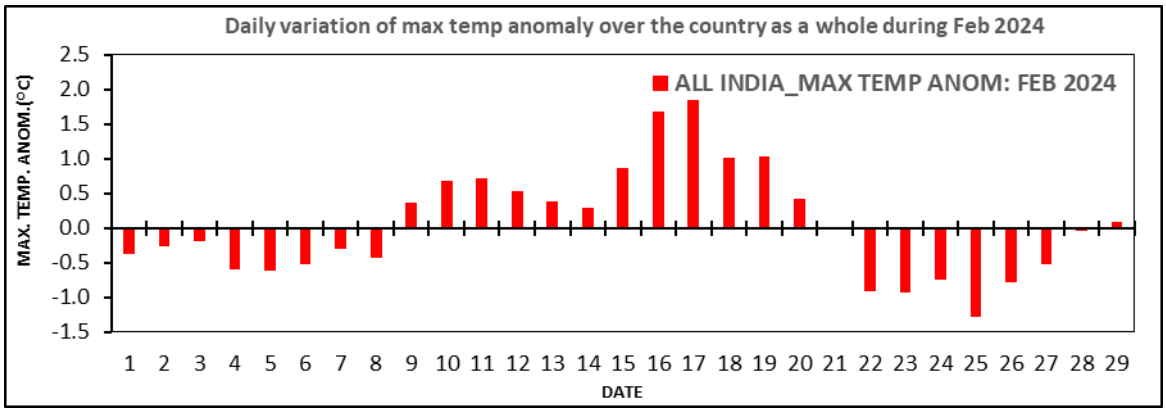


Fig 5(a): Daily variation of maximum temperature anomaly over the country as a whole for February 2024.

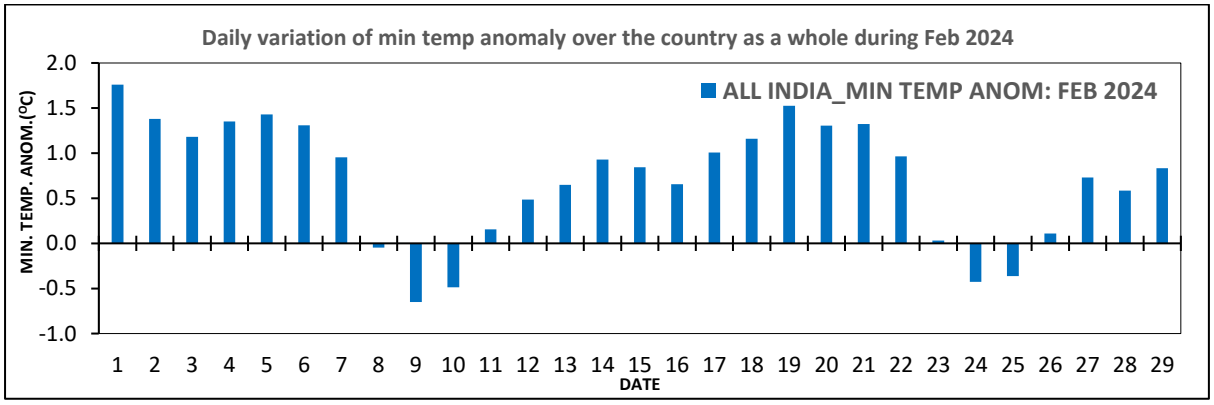


Fig 5(b): Daily variation of minimum temperature anomaly over the country as a whole for February 2024.

Figure 6 shows time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of February 1901-2024. Over the country during February, the average maximum temperature was

35th highest (27.59ºC with an anomaly of 0.01ºC) since 1901. The average minimum temperature was 2nd highest (14.61ºC with an anomaly of 0.79ºC) after the year 2016 (14.91ºC) since1901. The mean temperature was 16th highest (21.10ºC with an anomaly of 0.40ºC) since1901.

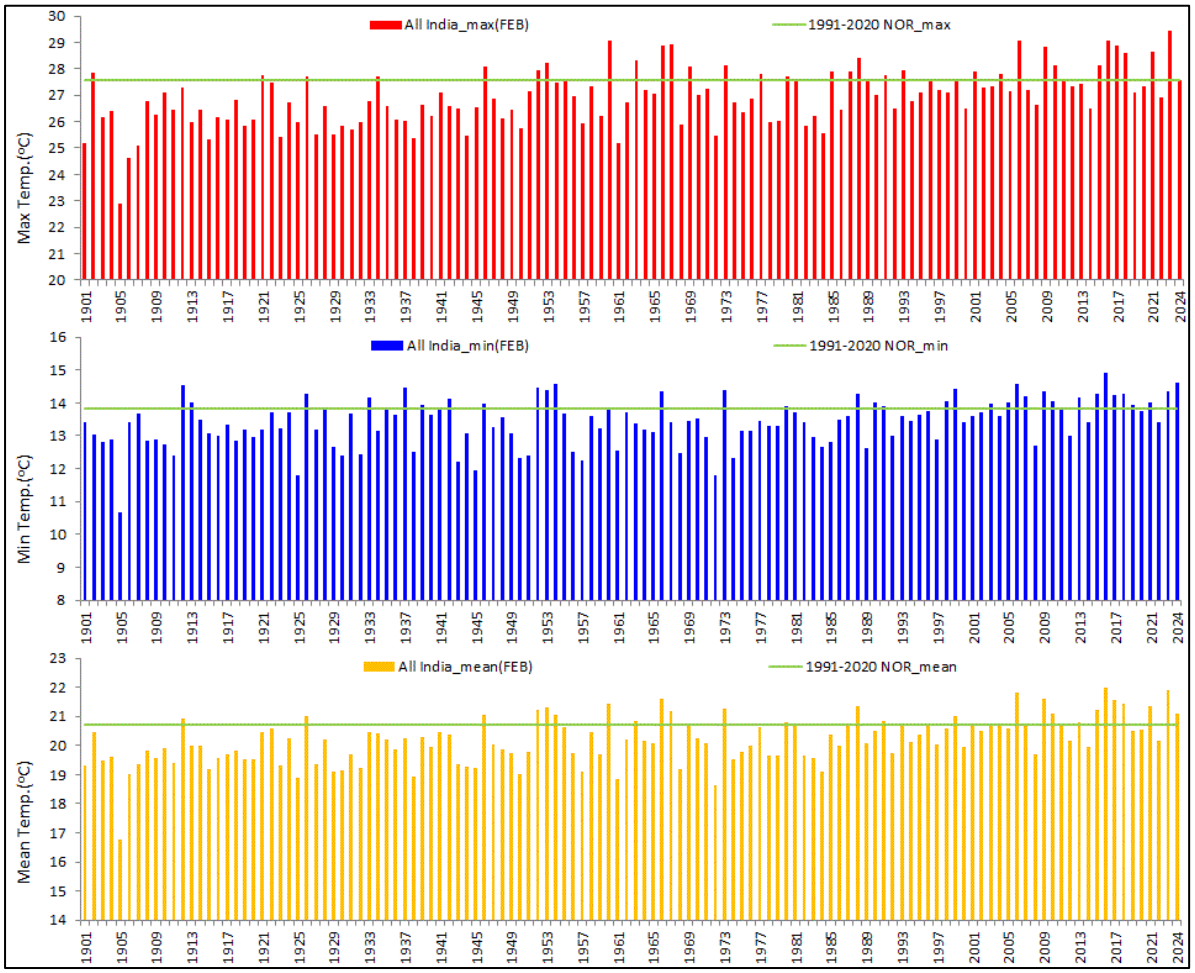


Fig 6: Time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of February 1901-2024.

Figure 7 shows time series of average minimum and mean temperature over the South Peninsular India for the month of February 1901-2024. Over South Peninsular India during February, the average maximum temperature was highest at 33.09ºC since 1901 against the earlier record of 33.03ºC in 2016. The average minimum temperature was highest at 21.17ºC since 1901 against the earlier record of 21.01ºC in 1937. The mean temperature was highest at 27.13ºC since 1901 against the earlier record of 26.89ºC in 2016.

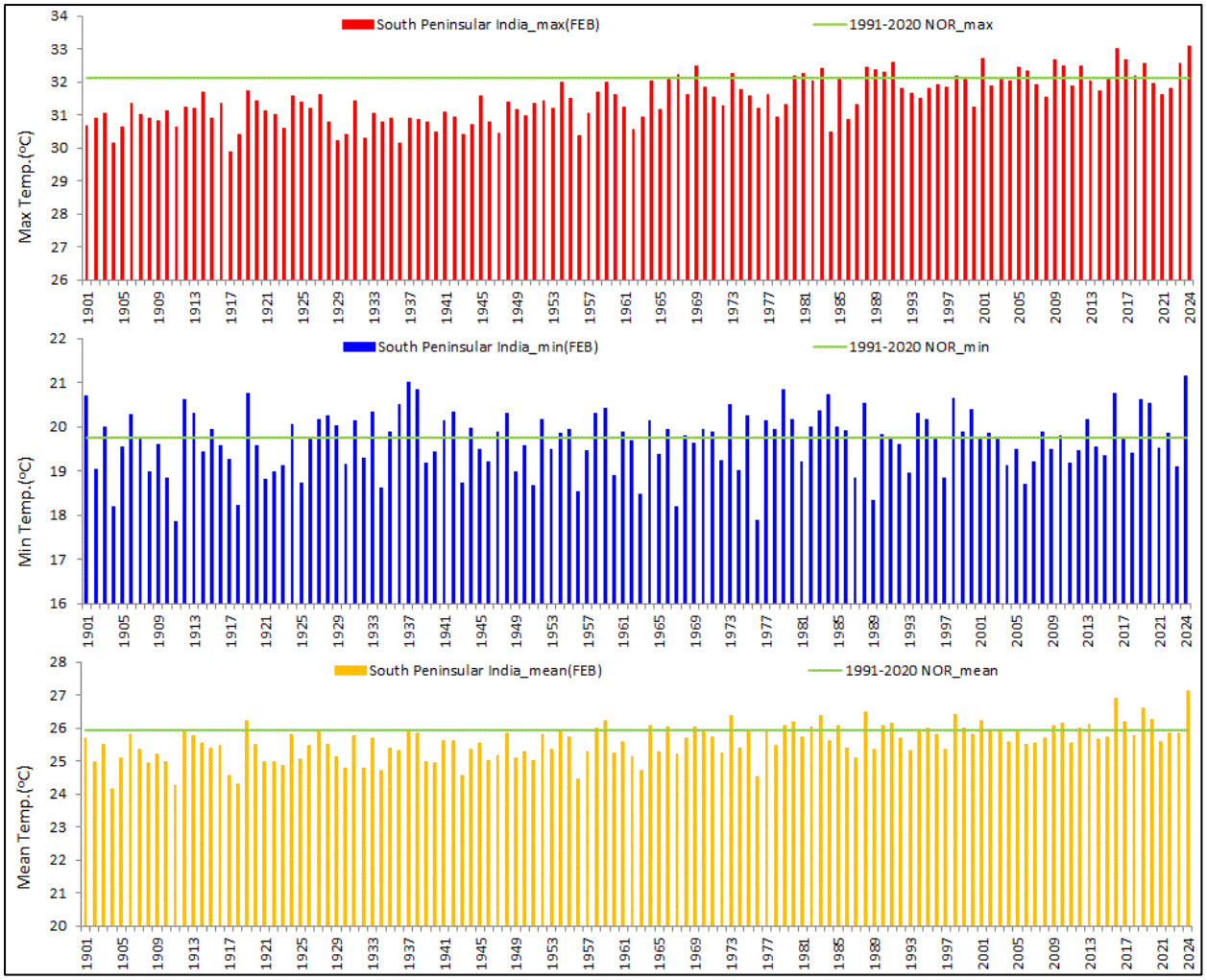


Fig 7: Time series of monthly average maximum, average minimum and mean temperature over South Peninsular India for the month of February 1901-2024.

Figure 8 shows time series of monthly average minimum temperature over the Central India for the month of February 1901-2024. Over Central India during February, the average minimum temperature was highest at 16.623ºC since 1901 against the earlier record of 16.617ºC in 2016.

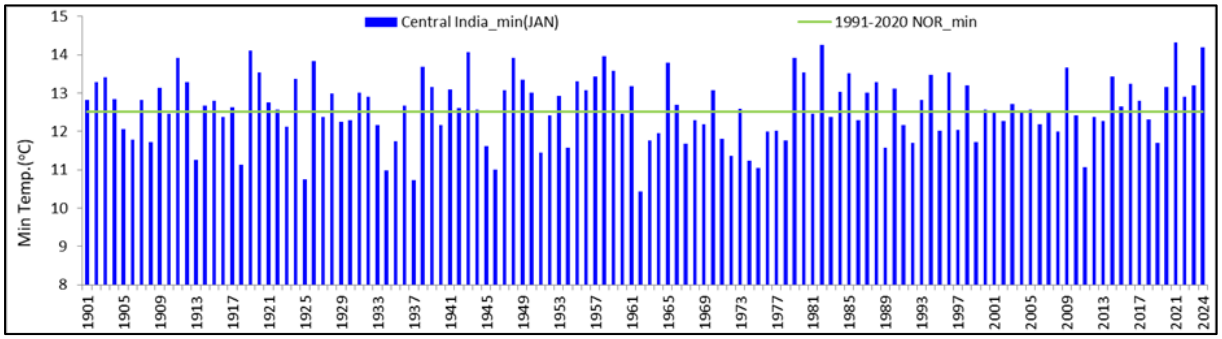


Fig 8: Time series of monthly average minimum temperature over Central India for the month of February 1901-2024.

The Temperatures during February 2024 for all India and homogeneous regions with its top ranks since 1901 are given bellow:

FEB 2024		Max Temp (^{0}C)	Min Temp (^{0}C)	Mean Temp (^{0}C)
ALL INDIA_wMask	**ACTUAL**	**27.59**	**14.61**	**21.10**
	NORMAL	27.58	13.82	20.70
	ANOMALY	0.01	0.79	0.40
	Rank since 1901	35	2	16
NORTHWEST INDIA	**ACTUAL**	**21.69**	**8.54**	**15.11**
	NORMAL	22.37	8.94	15.66
	ANOMALY	-0.68	-0.41	-0.55
	Rank since 1901	56	52	54
EAST & NORTHEAST INDIA	**ACTUAL**	**24.97**	**13.21**	**19.09**
	NORMAL	25.71	12.66	19.19
	ANOMALY	-0.74	0.54	-0.10
	Rank since 1901	66	14	39
CENTRAL INDIA	**ACTUAL**	**30.95**	**16.62**	**23.79**
	NORMAL	30.53	14.99	22.76
	ANOMALY	0.43	1.63	1.03
	Rank since 1901	27	1	7
SOUTH PENNINSULAR INDIA	**ACTUAL**	**33.09**	**21.17**	**27.13**
	NORMAL	32.13	19.74	25.93
	ANOMALY	0.97	1.43	1.20
	Rank since 1901	1	1	1

Note: Values are rounded off to nearest two decimal

The five highest temperature records with corresponding ranks since 1901 along with year of occurrence for all India, Central India (TMin) and South Peninsular India (TMax, TMin, TMean) are given in the table below;

All India (February 2024)				
Year	**TMin**	Normal	Anomaly	Rank
2016	14.91	13.82	1.09	1
2024	14.61		0.79	2
2006	14.59		0.77	3
1954	14.57		0.75	4
1912	14.55		0.73	5

South Peninsular India (February 2024)				
Year	**TMax**	Normal	Anomaly	Rank
2024	33.09	32.13	0.97	1
2016	33.03		0.91	2
2001	32.71		0.58	3
2009	32.70		0.57	4
2017	32.68		0.55	5

Central India (February 2024)				
Year	**TMin**	Normal	Anomaly	Rank
2024	16.623	14.99	1.633	1
2016	16.617		1.628	2
1953	16.207		1.22	3
1926	16.007		1.02	4
1912	15.886		0.90	5

South Peninsular India (February 2024)				
Year	**TMin**	Normal	Anomaly	Rank
2024	21.17	19.74	1.43	1
1937	21.01		1.27	2
1979	20.86		1.11	3
1938	20.84		1.10	4
1919	20.77		1.03	5

South Peninsular India (February 2024)				
Year	**TMean**	Normal	Anomaly	Rank
2024	27.13	25.93	1.20	1
2016	26.89		0.96	2
2019	26.61		0.67	3
1988	26.51		0.57	4
1998	26.43		0.49	5

The observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India and their departures from normal (1991 to 2020 period) for the month of February 2024 is given in Figure **9**.

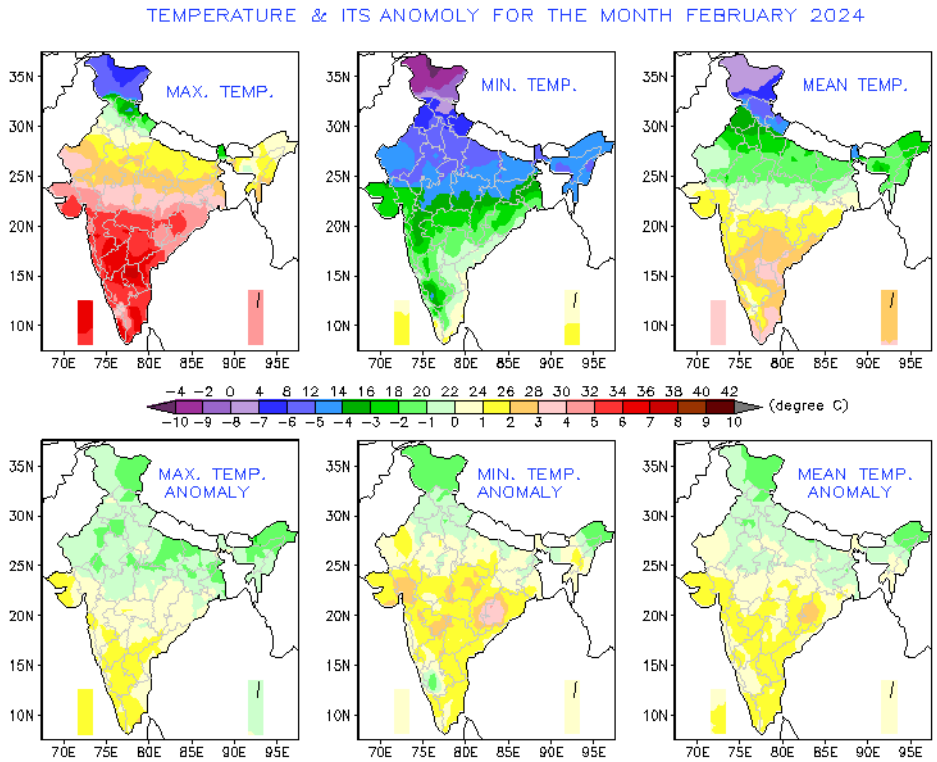


Fig 9: Observed spatial temperature pattern of monthly average maximum, average minimum, and mean temperature over India (top three from left to right) and their departure from normal (1991 to 2020 period) for February 2024 (lower three from left to right).

5. Significant Weather Events

During February 2024, total 6 persons reportedly claimed dead & one person missing. Damage to crops was reported from Amaravati, Nagpur, Wardha, & Yavatmal districts of Maharashtra due to hailstorm on 10th February.

The details of the area effected by the various events are summarized and given in the table below:

DATE	Events	DEATH	MISSING	DISTRICT (STATE / UT) AFFECTED
22 Feb.	**Snowfall**	1	1	Gulmarg (Jammu & Kashmir)
27 Feb.	**Lightning**	2	-	Shahdol (Madhya Pradesh)
6 Feb.	**Heavy Rains & Landslides:**	2	-	Shimla (Himachal Pradesh)
22 Feb.	**Heavy Rains & Landslides:**	1	-	Ramban (Jammu & Kashmir)

Fig.10 shows deaths due to significant weather events during February 2024. (Based on real time media reports.)

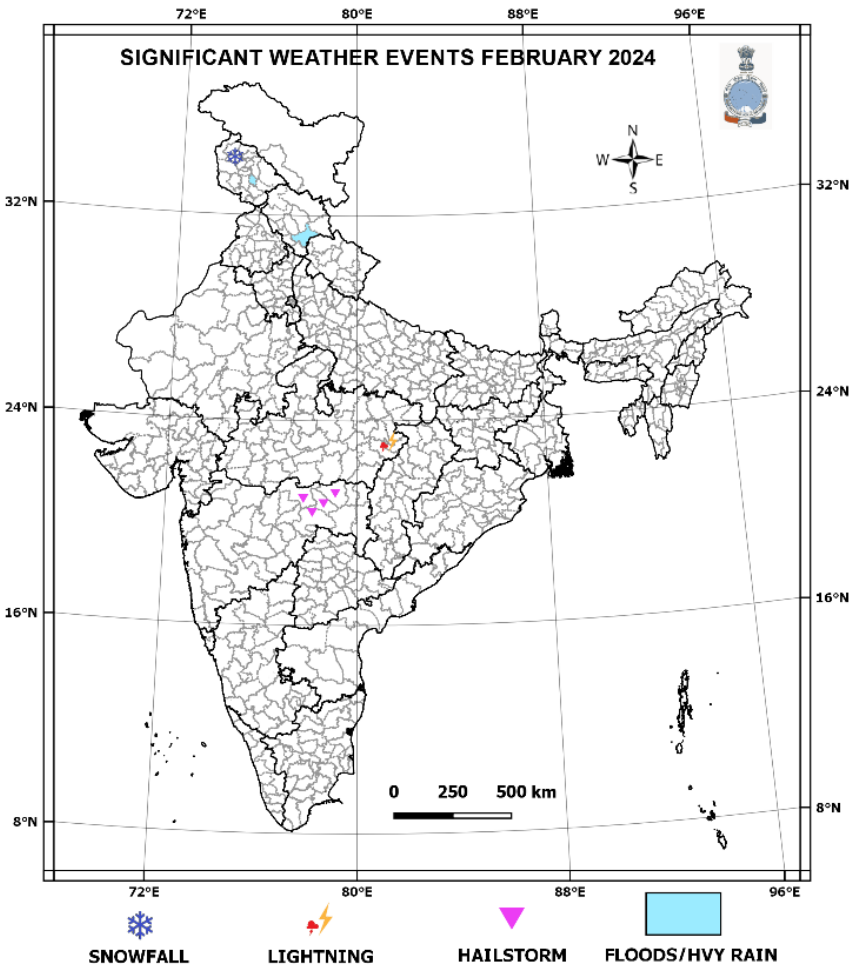


Fig. 10: Significant weather events during February 2024 which affected population (Based on real-time media report)