



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 January 2024

1. Monthly Rainfall Scenario (01 to 31 Jan,2024)

The rainfall over the country as a whole for the month of January 2024 shows that it has recorded 7.2 mm rainfall, which is 58% less than its Long Period Average (LPA) 17.1 mm. This All India Rainfall (7.2 mm) was 9th lowest since 1901. The prior lowest rainfall years in January are 2007 (2.3 mm), 2018 (2.9 mm), 1946 (4.4 mm), 1914 (4.7 mm), 1916 (5.1 mm), 1913 (6.5 mm), 1963 (6.9 mm) and 1937 (7 mm). Rainfall over Northwest India (3.1 mm) was 2nd lowest since 1901. RF over South peninsular India (18.2 mm) was 22nd highest since 1901 but 3rd highest since 2001

Daily variation of the rainfall over the country as a whole during the month of January 2024 with normal (1971-2020) and All India rainfall percentage departure from normal for January during 1901-2024 is shown in the figure 1(a) and 1(b) respectively.

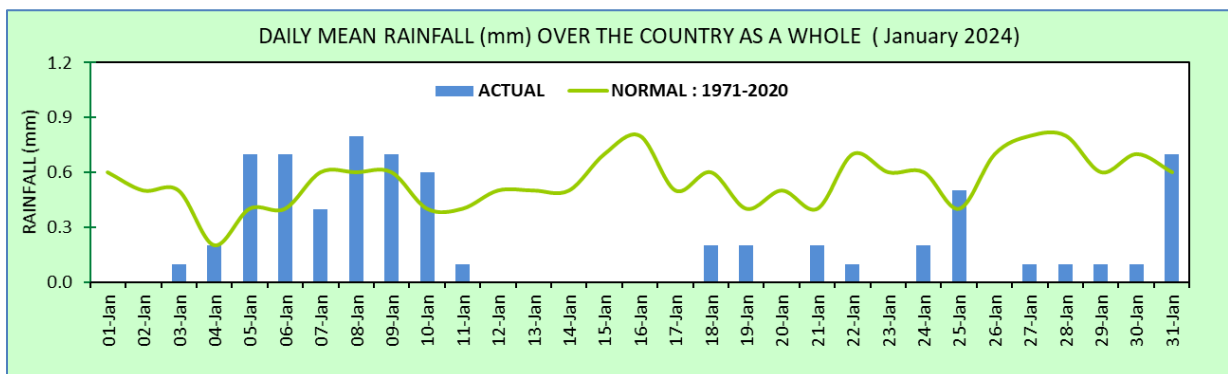


Fig.1 (a): Daily variation of rainfall over the country as a whole during January 2024.

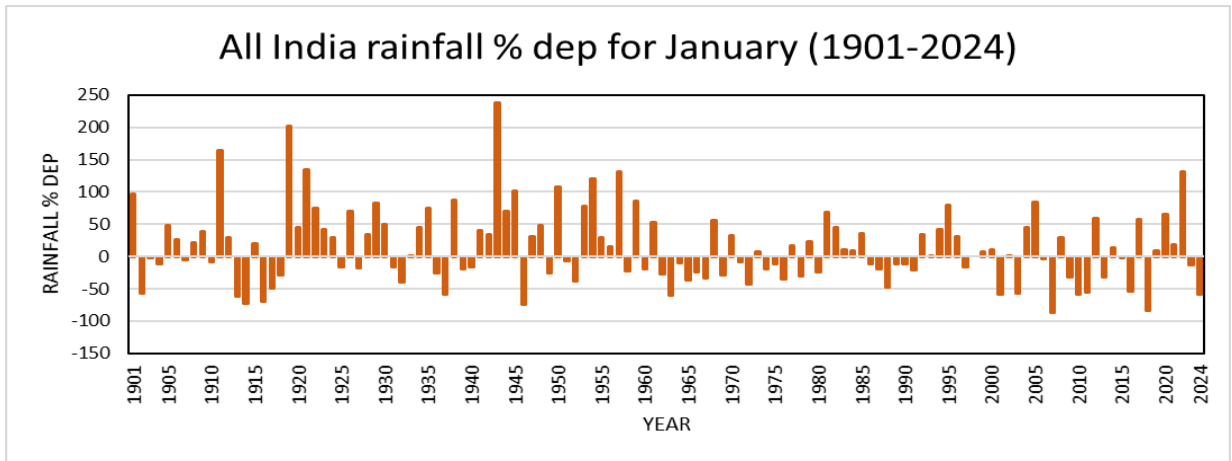


Fig.1(b): All India monthly rainfall percentage departure for the month of January (1901-2024) based on normal (1971-2020).

The time series of actual rainfall for January since 1901 for All India, Northwest India and South peninsular India are given in Fig. 2(a), 2(b), 2(c) respectively

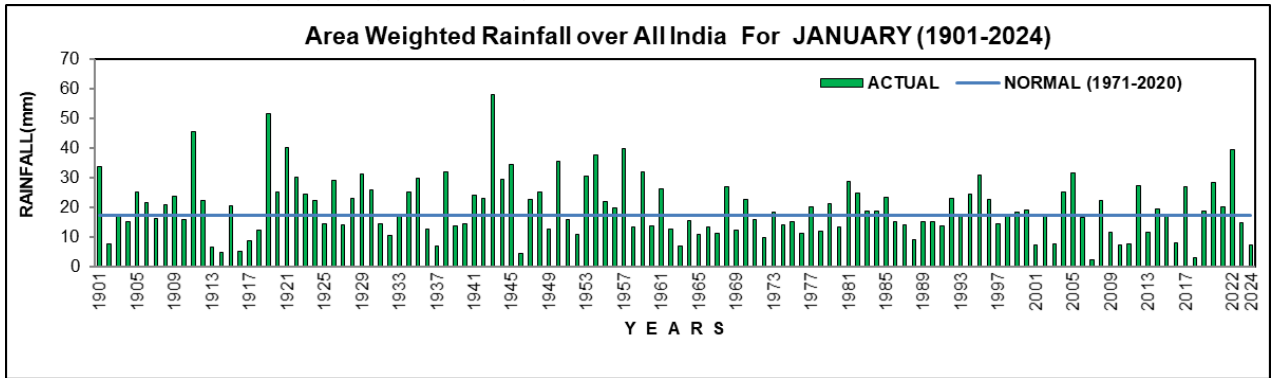


Fig. 2 (a): Time series of area weighted rainfall over All India for January (1901 - 2024)

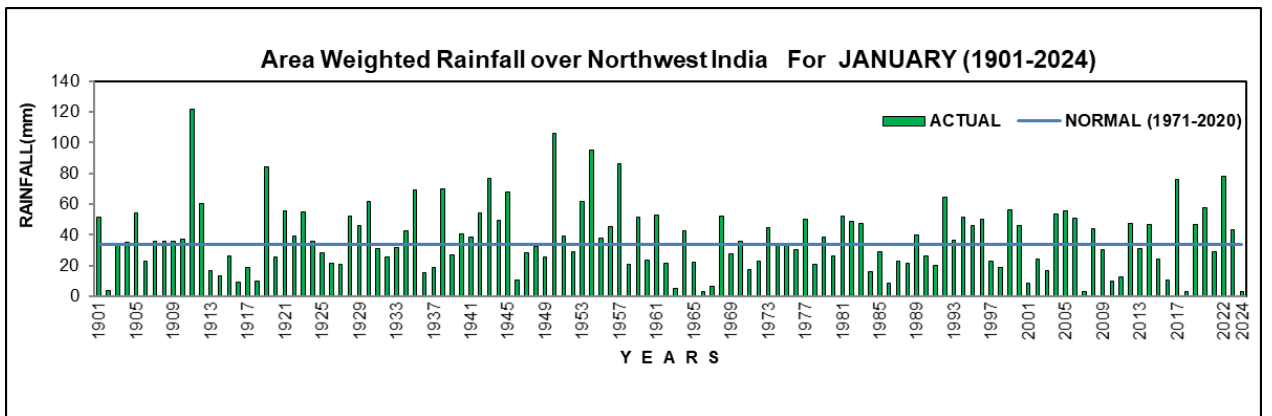


Fig. 2 (b): Time series of area weighted rainfall over northwest India for January (1901 - 2024)

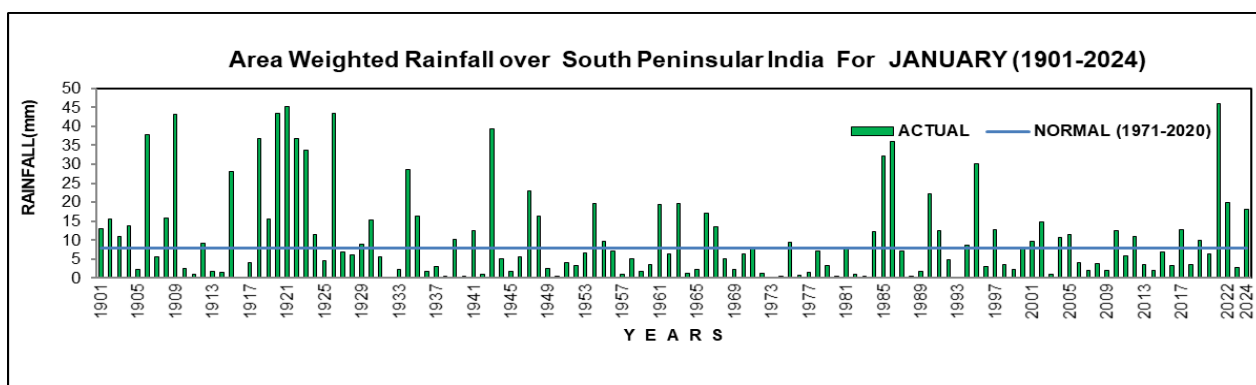


Fig. 2 (c): Time series of area weighted rainfall over south peninsular India for January (1901 - 2024)

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

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	7.2	17.1	-58.0
Northwest India	3.1	33.8	-91.0
Central India	5.3	7.4	-29.0
South Peninsula	18.2	7.8	133.0
East & northeast India	5.6	17.2	-67.0

During this month, 7 sub division received large excess, 1 received excess, 6 normal, 3 received deficient, 19 received large deficient rainfall. Fig. 3 shows Subdivision-wise rainfall distribution for January 2024

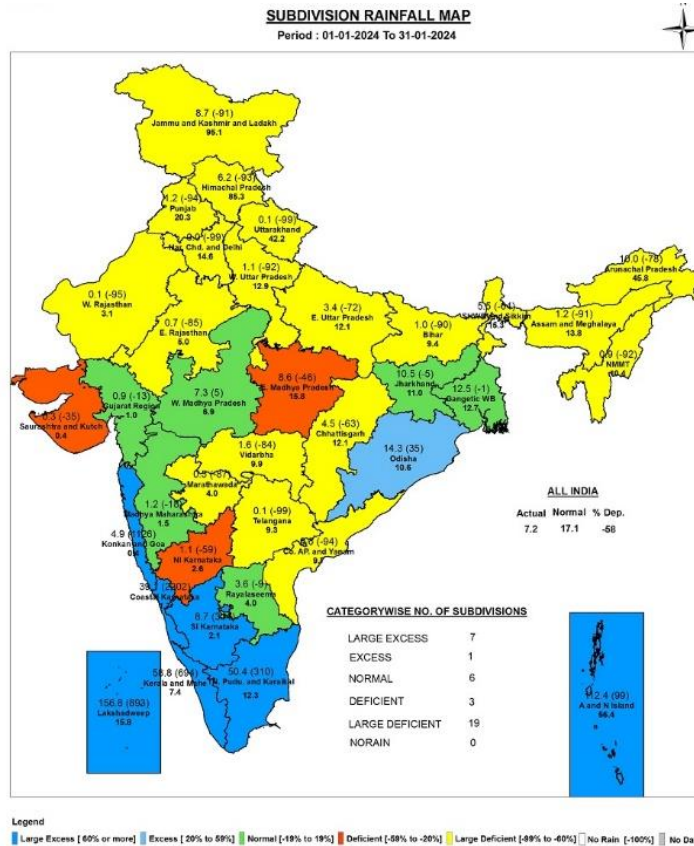


Fig. 3: Subdivision-wise rainfall distribution for January 2024.

The observed spatial distribution of rainfall during January 2024, normal rainfall based on data of 1971 to 2020 and rainfall departures from normal during January 2024 are given in Fig.4.

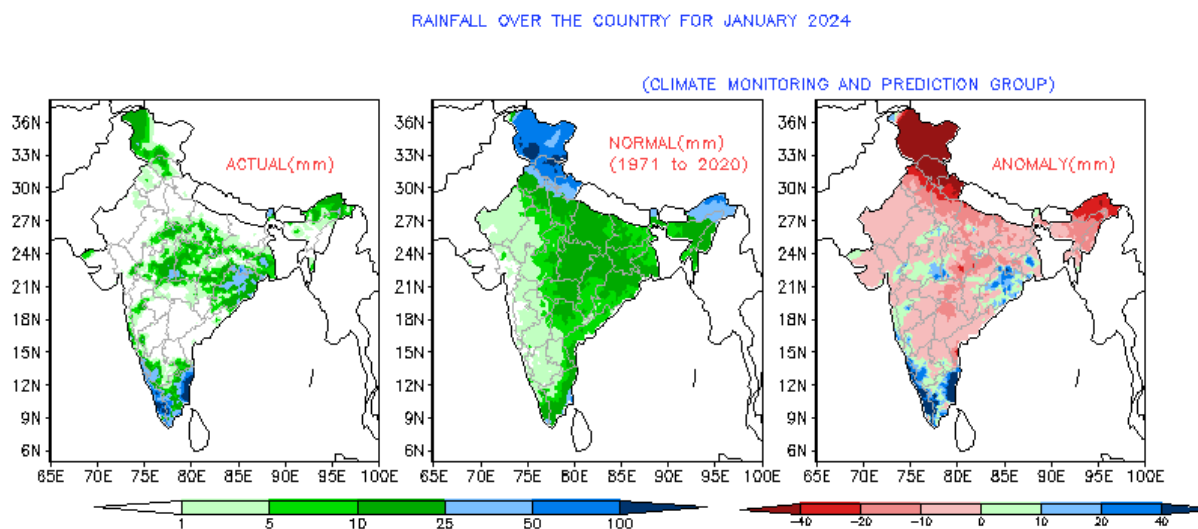


Fig. 4: Observed Spatial Rainfall pattern for the month of January 2024 over India and their departure from normal (1971 to 2020 period).

2. Frequency of Heavy Rainfall events

The January 2024 witnessed extremely heavy rainfall events (> 204.4 mm mm of rainfall) mainly over Tamilnadu. The location of occurrences of heavy, very heavy and extremely heavy rainfall events is shown in the Figure 5.

Out of total 75 stations, 4 stations reported extremely heavy rainfall (> 204.4 mm), 18 station reported very heavy rainfall (115.6 to 204.4 mm) and 53 stations reported heavy rainfall (64.5 to 115.5 mm of rainfall) during this month.

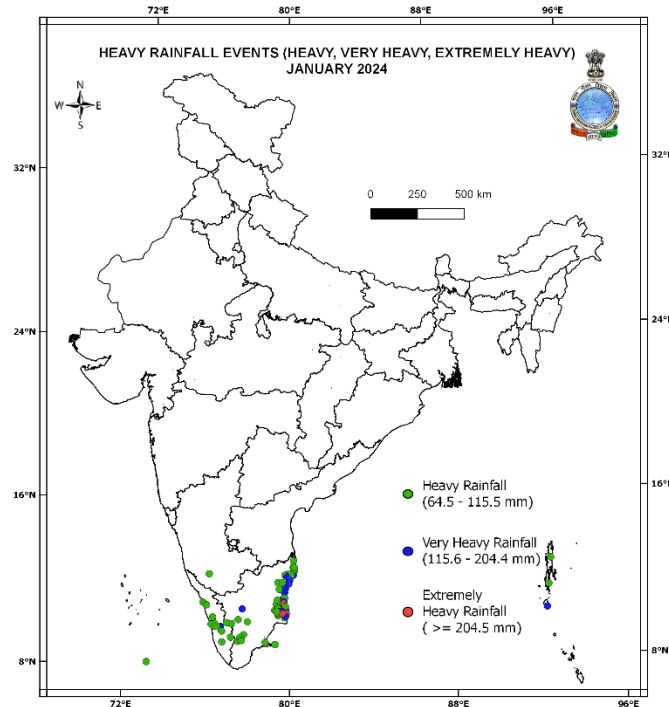


Fig. 5: The location of occurrences of heavy rainfall events in the month January 2024.

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

3. Chief Synoptic weather features observed during January 2024

During the month there were 4 number of Western Disturbances (WD) (3-8 January, 7-11 January, 25-27 January and 28-31 January) moved across north India. All WDs moved across extreme north of India north of 30degN except the last WD of 28-31 Jan. It is causing rain/Snow over northwest India. Cold Day and Cold Wave. Season's 1st active Western Disturbance (WD) affected northwest India from 28 Jan. It also caused 1st spell of light to moderate rain/Snow of this winter season, over Kashmir and adjoining areas and Himachal Pradesh during 29-31 Jan 2024 and light rainfall over Punjab on 30-31 January 2024.

During the month active Easterly waves activity observed over the South Peninsular India. A North-South Trough in easterly observed at lower levels during 3rd week 15-22 Jan caused rains over eastern India including over Odisha and West Bengal in many days during the period.

The dense to very dense fog (visibility <200 m) conditions along with low cloud cover, continued to prevail, across many parts of Indo-Gangetic plains throughout the month mainly due to continued absence of significant winds at lower levels near surface, during evening to late morning hours, across northern Plains of India and adjoining central part of India.

4. Characteristics of Temperatures for the month of January 2024

The average maximum, average minimum and mean temperature for the country as a whole during January 2024 were 25.66°C, 14.66°C and 20.16°C respectively, against the normal of 25.60°C, 13.69°C and 19.64°C based on the period of 1981-2010. Thus, the average minimum temperature and mean temperature were above normal by 0.97°C, 0.51°C respectively except the average maximum temperature was normal by 0.06°C for the country as a whole. The climatological data based on the period of 1981 to 2010 are used to calculate the normal and hence the anomaly (Actual average temperature in 2024 - normal temperature based on data of 1981-2010). The daily variation of maximum and minimum temperature anomaly over the country as a whole for January 2024 is shown in the figure 6(a) and 6(b).

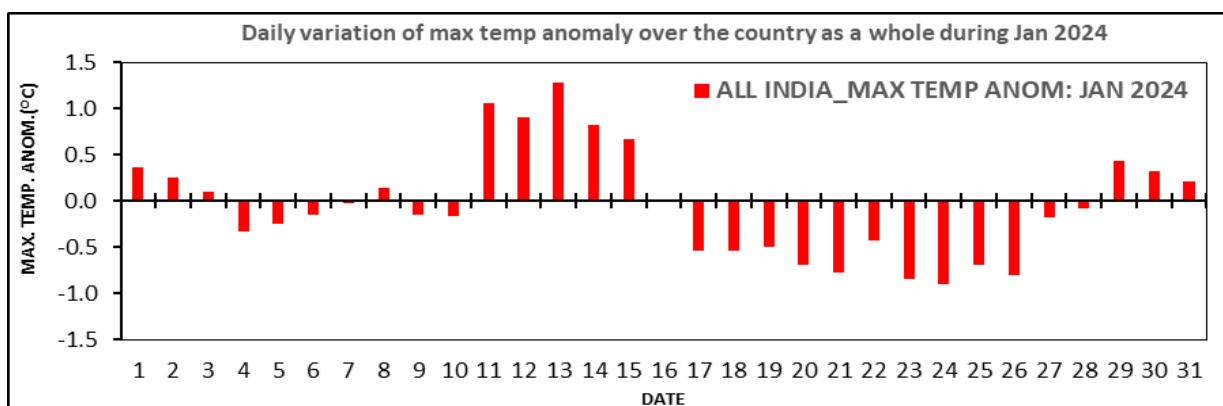


Fig. 6(a): Daily variation of maximum temperature anomaly over the country as a whole for January 2024.

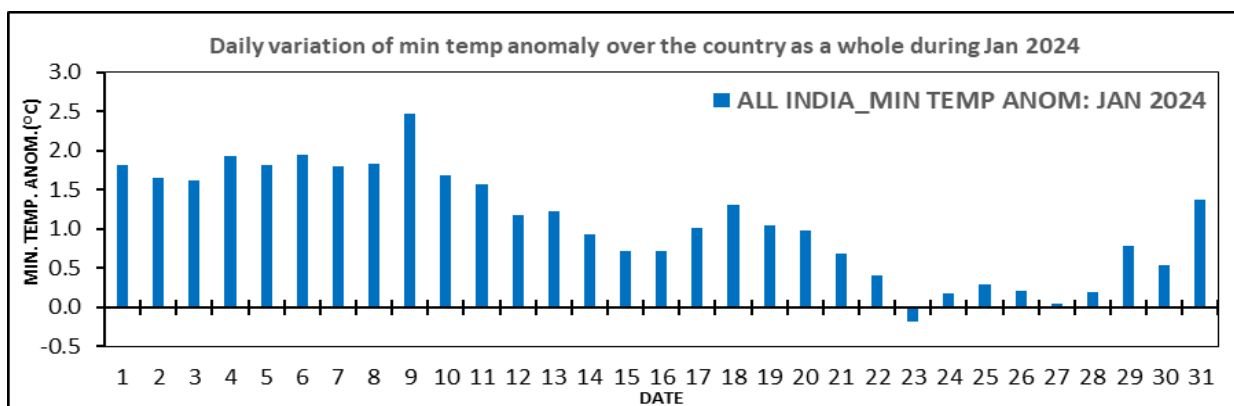


Fig. 6(b): Daily variation of minimum temperature anomaly over the country as a whole for January 2024.

Figure 7 shows time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of January (1901-2024). Over the country during January, the average maximum temperature was 37th

highest (25.66°C with an anomaly of 0.06°C) since 1901. The average minimum temperature was 4th highest (14.66°C with an anomaly of 0.97°C) after the years 1919 (14.93°C), 1958 (14.779°C), 2021 (14.776°C) since 1901. The mean temperature was 9th highest (20.16°C with an anomaly of 0.51°C) since 1901.

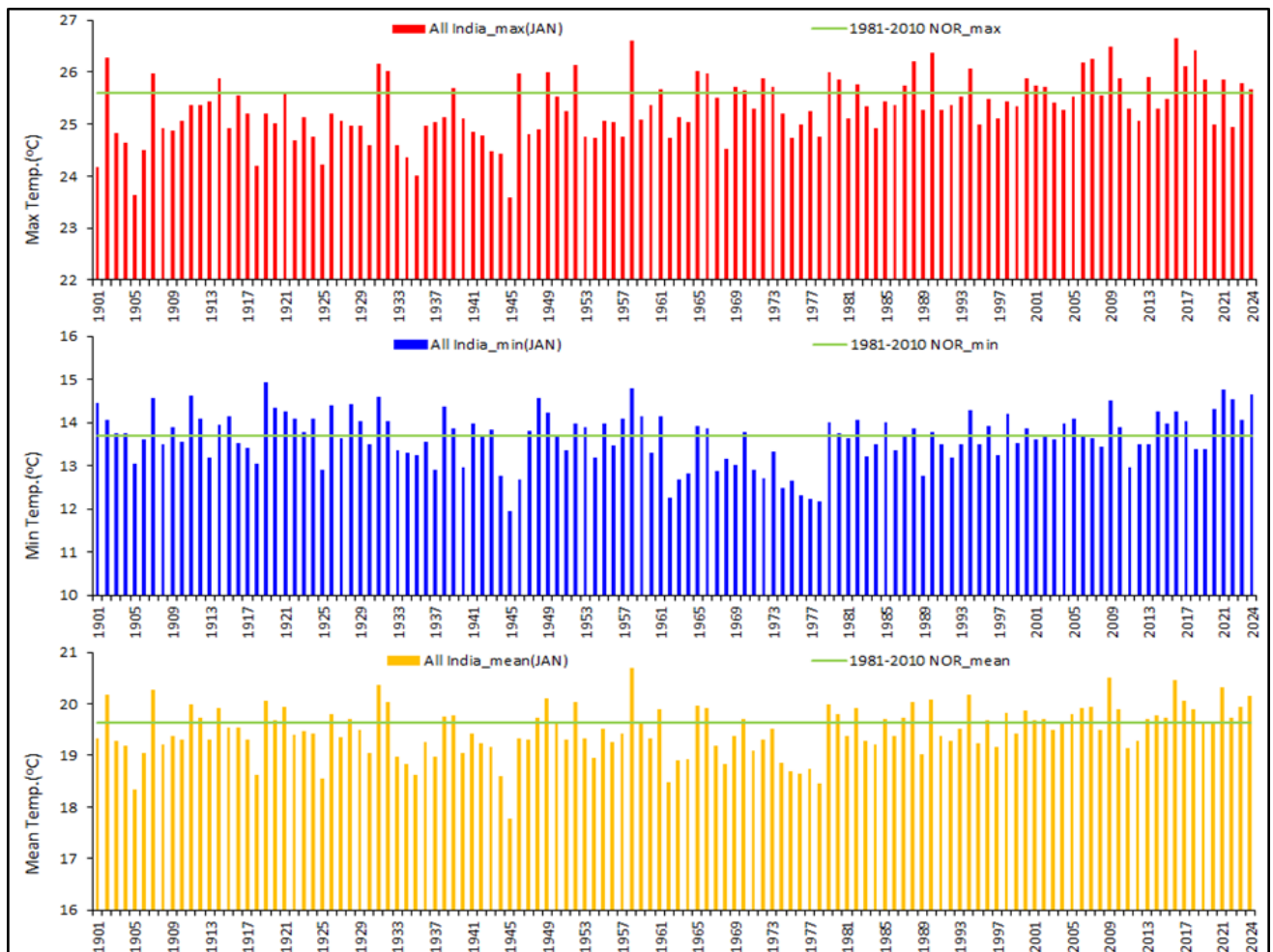


Fig. 7: Time series of monthly average maximum, average minimum and mean temperature over the country as a whole for the month of January (1901-2024).

Figure 8 shows time series of monthly average maximum, average minimum and mean temperature over the South Peninsular India for the month of January 1901-2024. Over South Peninsular India during January, the average maximum temperature was 4th highest (30.68°C with an anomaly of 0.67°C) after the years 2016 (31.10°C), 2013 (30.95°C), 2020 (30.72°C) since 1901. The average minimum temperature was 2nd highest (22.18°C with an anomaly of 1.59°C) after the year 2021 (22.33°C) since 1901. The mean temperature was highest at 26.43°C since 1901 against the earlier record of 26.36°C in 2021.

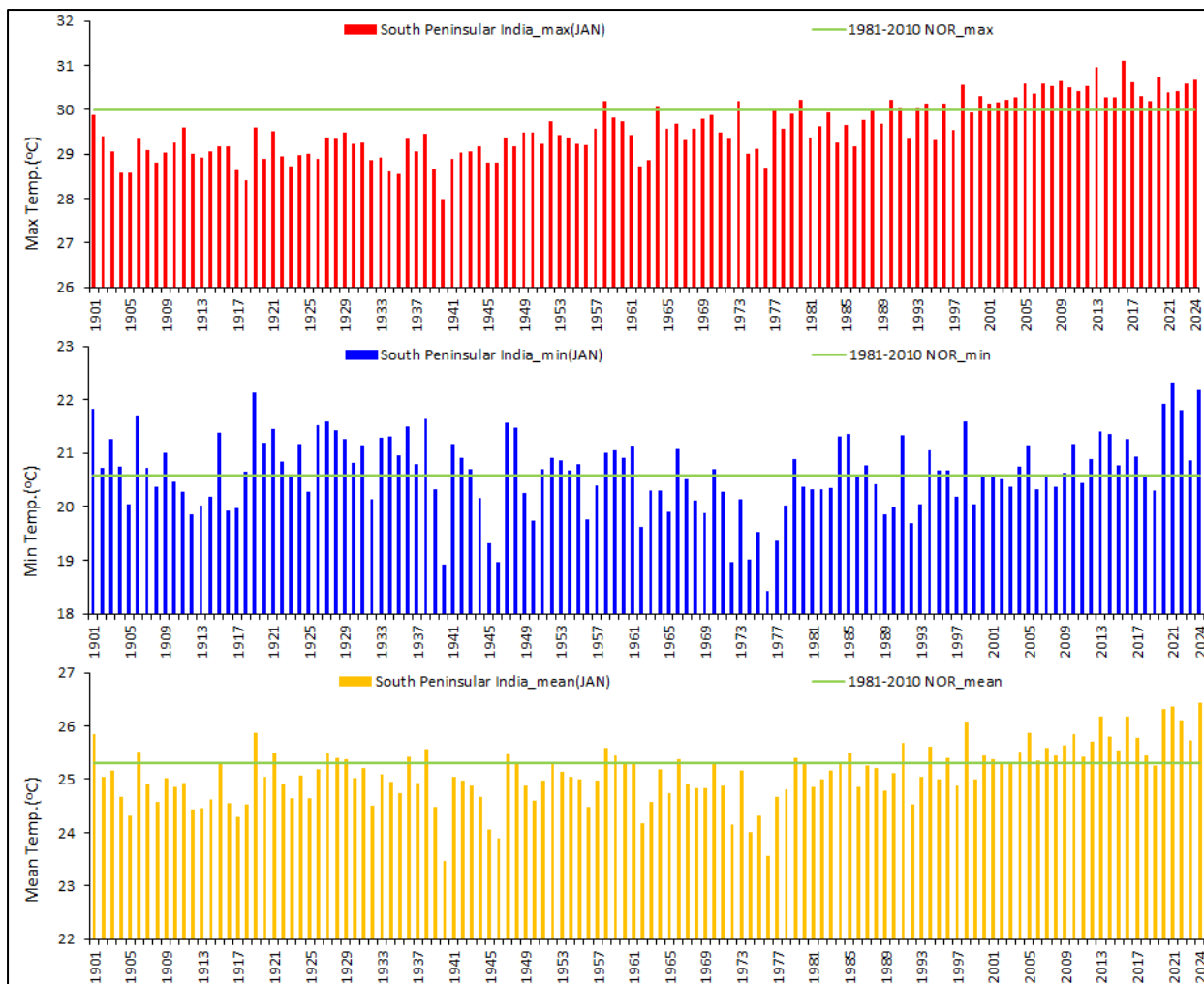


Fig. 8: Time series of monthly average maximum, average minimum and mean temperature over South Peninsular India for the month of January 1901-2024.

Figure 9 shows time series of monthly average minimum temperature over the Central India for the month of January 1901-2024. Over Central India during January, the average minimum temperature was 2nd highest (15.00°C with an anomaly of 1.43°C) after the year 1958 (15.06°C) since 1901.

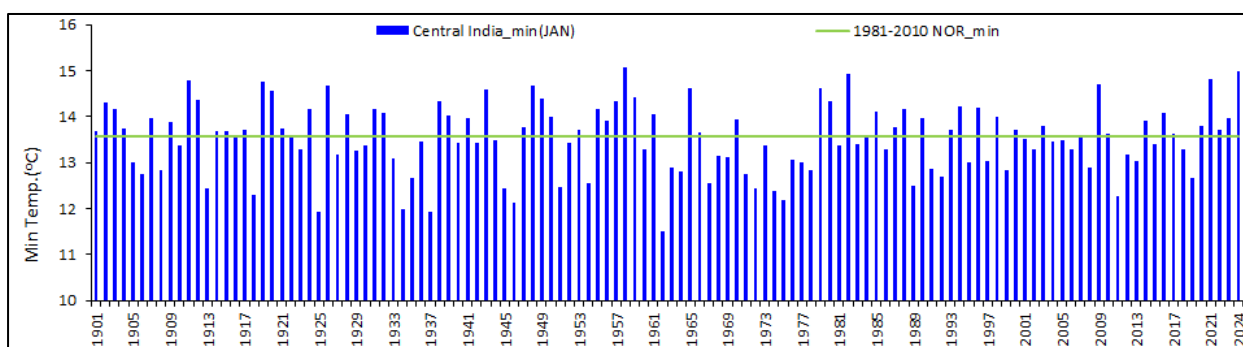


Fig. 9: Time series of monthly average minimum temperature over Central India for the month of January 1901-2024.

The Temperatures during January 2024 for all India and homogeneous regions with its top ranks since 1901 are given below;

JAN 2024		Max Temp (°C)	Min Temp (°C)	Mean Temp (°C)
ALL INDIA	ACTUAL	25.66	14.66	20.16
	NORMAL	25.60	13.69	19.64
	ANOMALY	0.06	0.97	0.51
	Rank since 1901	37	4	9
NORTHWEST INDIA	ACTUAL	17.79	5.52	11.65
	NORMAL	18.33	5.61	11.97
	ANOMALY	-0.54	-0.10	-0.32
	Rank since 1901	68	62	61
EAST & NORTHEAST INDIA	ACTUAL	22.62	10.25	16.44
	NORMAL	23.04	9.96	16.50
	ANOMALY	-0.41	0.29	-0.06
	Rank since 1901	95	38	71
CENTRAL INDIA	ACTUAL	27.74	15.00	21.37
	NORMAL	27.80	13.56	20.68
	ANOMALY	-0.06	1.43	0.69
	Rank since 1901	42	2	12
SOUTH PENNINSULAR INDIA	ACTUAL	30.68	22.18	26.43
	NORMAL	30.00	20.59	25.30
	ANOMALY	0.67	1.59	1.13
	Rank since 1901	4	2	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 (January 2024)					South Peninsular India (January 2024)				
Year	TMin	Normal	Anomaly	Rank	Year	TMax	Normal	Anomaly	Rank
1919	14.93	13.69	1.24	1	2016	31.10	30.00	1.09	1
1958	14.779		1.09	2	2013	30.95		0.94	2
2021	14.776		1.09	3	2020	30.72		0.72	3
2024	14.66		0.97	4	2024	30.68		0.67	4
1911	14.62		0.93	5	2009	30.65		0.64	5

Central India (January 2024)					South Peninsular India (January 2024)				
Year	TMin	Normal	Anomaly	Rank	Year	TMin	Normal	Anomaly	Rank
1958	15.06	13.56	1.50	1	2021	22.33	20.59	1.74	1
2024	15.00		1.43	2	2024	22.18		1.59	2
1982	14.92		1.36	3	1919	22.14		1.55	3
2021	14.82		1.25	4	2020	21.93		1.34	4
1911	14.79		1.23	5	1901	21.82		1.23	5

South Peninsular India (January 2024)				
Year	TMean	Normal	Anomaly	Rank
2024	26.43	25.30	1.13	1
2021	26.36		1.07	2
2020	26.32		1.03	3
2016	26.18		0.89	4
2013	26.17		0.88	5

The observed spatial temperature pattern of monthly average maximum, average minimum and mean temperature over India and their departures from normal (1981 to 2010 period) for the month of January 2024 is given in Figure 10.

TEMPERATURE & ITS ANOMALY FOR THE MONTH JANUARY 2024

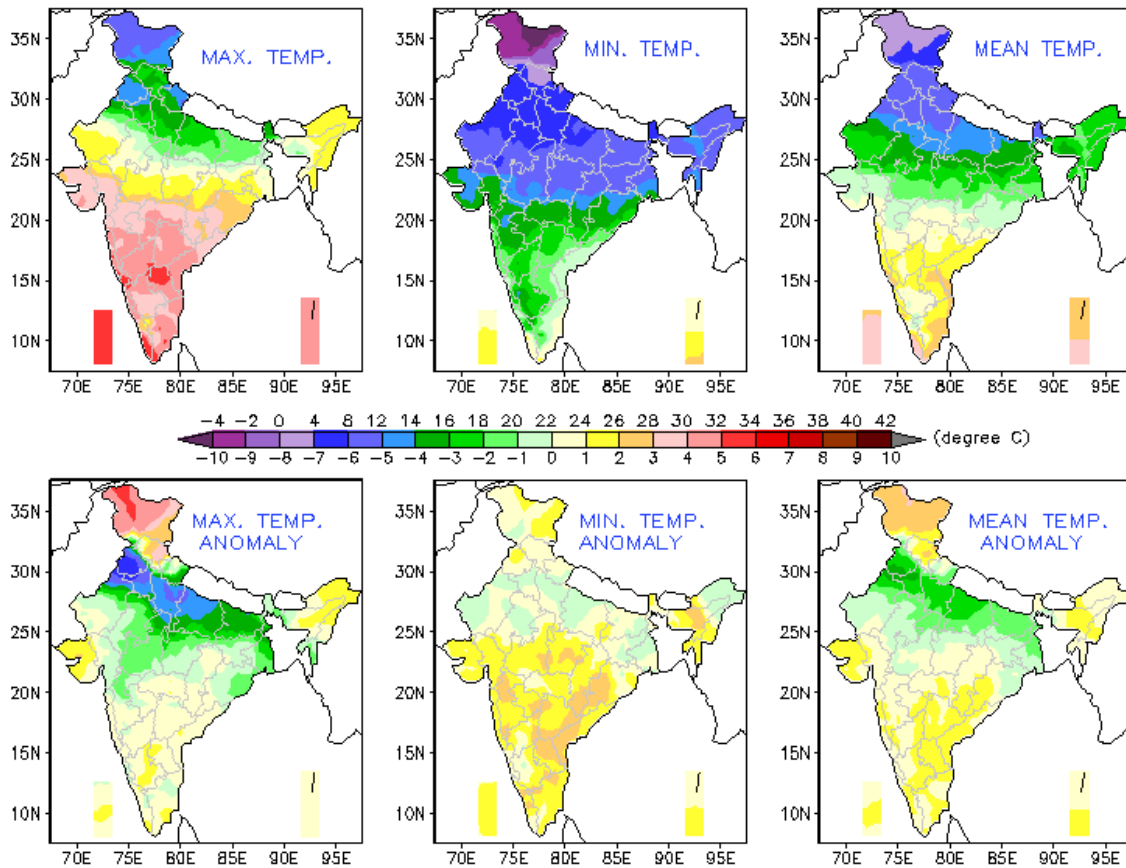


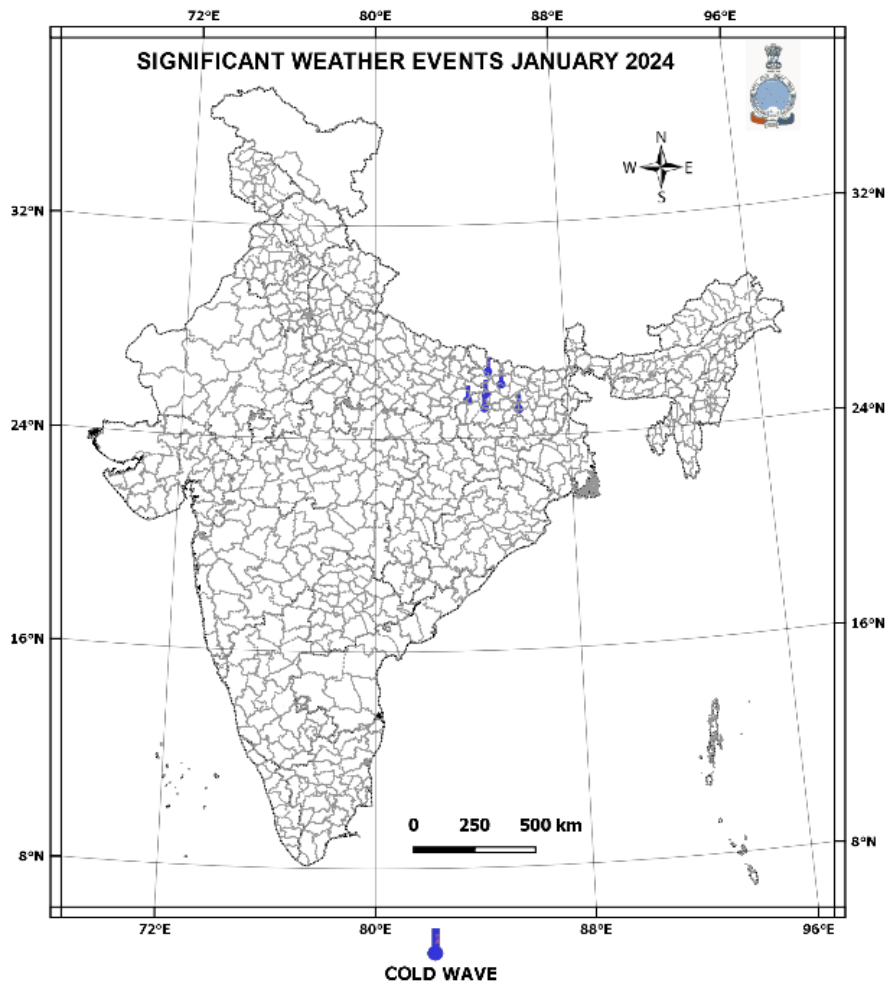
Fig. 10: Observed spatial temperature pattern of monthly average maximum, average minimum, and mean temperature over India (top three from left to right) and their departure from normal (1981 to 2010 period) for January 2024 (lower three from left to right).

5. Significant Weather Events during January 2024

During January, total 6 persons reportedly claimed dead due to significant weather events. The details of casualties given below, which are based on real time media reports. Fig.11 shows deaths due to significant weather events during January 2024. (Based on real time media reports.)

COLD WAVE: Total 6 persons reportedly claimed dead, during January, because of cold wave. The details of the area effected by the events are summarized and given in the table below;

DATE	DEATH	INJURED		MISSING	LIVESTOCK	DISTRICT (STATE / UT) AFFECTED
10, 24 Jan.	6					Arwal, Buxar, East Champaran, Lakhisarai, Muzaffarpur, Saran (Bihar)



**Fig.11 Significant weather events during January 2024
(Based on real-time media report)**
