



## Weather in India

### WINTER SEASON (January-February 2022)<sup>†</sup>

#### 1. Introduction

The winter season 2022 in general had been mild in terms of temperature realized over major parts of India. Day temperatures remained below normal and *severe cold day/cold day*\* conditions were experienced over parts of northwest and central India.

The Northeast Monsoon rains ceased over Tamil Nadu, Puducherry, Karaikal, Kerala, Mahe, adjoining areas of coastal Andhra Pradesh, Yanam, Rayalaseema and south interior Karnataka with effect from 22 January 2022.

January had been wetter than normal, while February remained drier than normal, while the all India rainfall with respect to long period average (LPA) for the season had been 147% of LPA.

The core of Sub-Tropical Westerly Jet (STWJ) was seen between Latitude 27° N and 34° N all through the season. Very dense to dense fog was observed over northwest India on many days during the month of January.

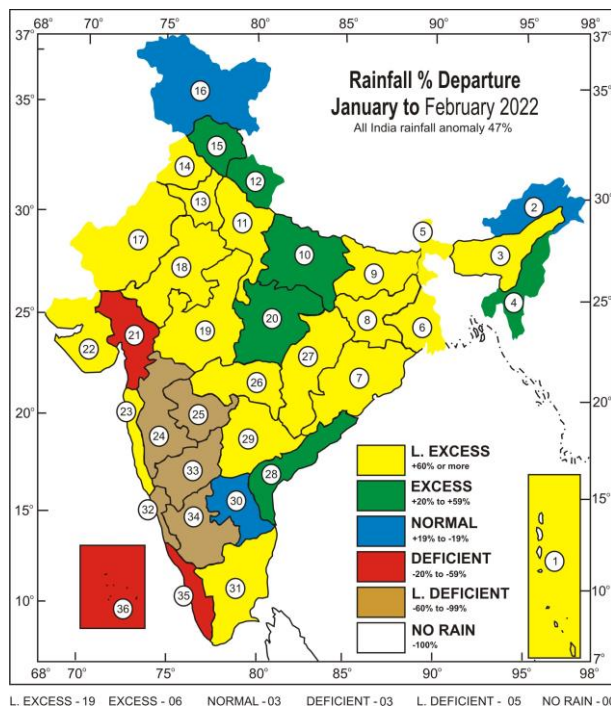
No intense system formed over the Indian seas other than 2 induced low pressures areas formed in the westerly wind regime during the season.

#### 2. Seasonal rainfall (January-February)

Rainfall during the season over the country as a whole was *above normal* with departure of 47% of LPA. The precipitation over all the four homogenous regions too was above normal. In contrast to last year, precipitation over the homogenous region of east and northeast India was above normal for both the months and the season as well during 2022. Rainfall in winter was either *deficient* or *large deficient* in all the sub-divisions for the homogenous regions of east and northeast India in both the months and the season in 2021, while no sub division recorded *deficient* or *large deficient* rainfall in the winter months and the season in this year.

(\* Definitions of terms in italics (other than subtitles) are given in Appendix.)

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**Fig. 1.** Sub-divisionwise seasonal rainfall departure from normal (%) for post monsoon season (January to February, 2022). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

<b>1</b> 146	<b>7</b> 113	<b>13</b> 166	<b>19</b> 63	<b>25</b> -95	<b>31</b> 72
<b>2</b> 0	<b>8</b> 149	<b>14</b> 169	<b>20</b> 42	<b>26</b> 65	<b>32</b> -80
<b>3</b> 79	<b>9</b> 102	<b>15</b> 32	<b>21</b> -35	<b>27</b> 145	<b>33</b> -90
<b>4</b> 54	<b>10</b> 50	<b>16</b> 9	<b>22</b> 205	<b>28</b> 42	<b>34</b> -90
<b>5</b> 95	<b>11</b> 165	<b>17</b> 198	<b>23</b> 321	<b>29</b> 125	<b>35</b> -29
<b>6</b> 150	<b>12</b> 59	<b>18</b> 138	<b>24</b> -74	<b>30</b> 17	<b>36</b> -31

The monthly and seasonal sub-divisional rainfall (actual, normal and percentage departure) are presented in Table 1. Also, representative amount of rainfall on a day-to-day basis are presented in Table 4. Out of the 36 meteorological sub-divisions of India, the seasonal rainfall was *large excess* in 19, *excess* in 6, *normal*, *deficient* in 3 sub-divisions each, *large deficient* in 5 sub-divisions and no any sub-divisions in no rain category. The percentage departure falling under various categories, viz., *large excess*, *excess*, *normal*, *deficient*, *large deficient* and *no rain* are shown in Fig. 1.

TABLE 1

Sub-division wise rainfall (mm) for each month and season as a whole (January - February 2022)

S. No.	Meteorological Sub-divisions	January			February			Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A. & N. Islands	52.9	56.4	-6%	144.2	23.7	508%	197.1	80.1	146%
2.	Arunachal Pradesh	47.0	45.8	3%	85.8	87.3	-2%	132.8	133.1	0%
3.	Assam & Meghalaya	23.7	13.8	72%	51.7	28.3	83%	75.5	42.1	79%
4.	Naga., Mani., Mizo. and Tri.	20.5	10.4	97%	28.7	21.5	33%	49.1	31.9	54%
5.	Sub-Himalayan West Bengal & Sikkim	19.6	15.3	28%	65.2	28.3	130%	84.8	43.6	95%
6.	Gangetic West Bengal	24.1	12.7	90%	49.3	16.6	197%	73.4	29.3	150%
7.	Orissa	43.4	10.6	310%	10.0	14.5	-31%	53.4	25.1	113%
8.	Jharkhand	24.5	11.0	123%	38.6	14.4	168%	63.1	25.4	149%
9.	Bihar	11.2	9.4	19%	28.8	10.4	177%	40.0	19.8	102%
10.	East Uttar Pradesh	27.1	12.1	124%	10.8	13.1	-18%	37.9	25.2	50%
11.	West Uttar Pradesh	59.7	12.9	363%	21.1	17.6	20%	80.8	30.5	165%
12.	Uttarakhand	108.4	42.2	157%	53.7	59.5	-10%	162.1	101.7	59%
13.	Haryana, Chandigarh & Delhi	70.0	14.6	379%	15.3	17.4	-12%	85.3	32.0	166%
14.	Punjab	104.5	20.3	415%	22.9	27.1	-15%	127.4	47.4	169%
15.	Himachal Pradesh	167.2	85.3	96%	80.5	101.8	-21%	247.6	187.1	32%
16.	Jammu & Kashmir and Ladakh	168.7	95.1	77%	77.1	130.4	-41%	245.9	225.5	9%
17.	West Rajasthan	24.2	3.1	681%	1.1	5.4	-79%	25.3	8.5	198%
18.	East Rajasthan	24.7	5.0	393%	1.3	5.9	-77%	26.0	10.9	138%
19.	West Madhya Pradesh	22.5	6.9	226%	0.3	7.1	-95%	22.8	14.0	63%
20.	East Madhya Pradesh	39.8	15.8	152%	7.7	17.6	-56%	47.5	33.4	42%
21.	Gujarat Region	1.0	1.0	-2%	0.0	0.5	-100%	1.0	1.5	-35%
22.	Saurashtra & Kutch & Diu	2.4	0.4	512%	0.0	0.4	-100%	2.4	0.8	206%
23.	Konkan & Goa	2.5	0.4	532%	0.0	0.2	-100%	2.5	0.6	321%
24.	Madhya Maharashtra	0.7	1.5	-52%	0.0	1.3	-100%	0.7	2.8	-74%
25.	Marathawada	0.3	4.0	-92%	0.0	2.4	-100%	0.3	6.4	-95%
26.	Vidarbha	27.0	9.9	173%	0.8	7.0	-88%	27.9	16.9	65%
27.	Chhattisgarh	43.2	12.1	257%	10.7	9.8	10%	53.9	21.9	146%
28.	Coastal Andhra Pradesh & Yanam	30.0	9.7	209%	1.5	12.5	-88%	31.5	22.2	42%
29.	Telangana	35.9	9.3	286%	0.1	6.7	-99%	36.0	16.0	125%
30.	Rayalaseema	10.3	4.0	158%	0.0	4.8	-100%	10.3	8.8	17%
31.	Tamil Nadu, Pudcherry & Karaikal	34.8	12.3	183%	7.8	12.5	-38%	42.6	24.8	72%
32.	Coastal Karnataka	0.3	1.7	-83%	0.3	1.3	-77%	0.6	3.0	-80%
33.	North Interior Karnataka	0.4	2.6	-84%	0.0	1.8	-100%	0.4	4.4	-90%
34.	South Interior Karnataka	0.5	2.1	-76%	0.0	3.6	-99%	0.5	5.7	-90%
35.	Kerala & Mahe	3.0	7.4	-60%	12.0	13.7	-13%	14.9	21.1	-29%
36.	Lakshadweep	0.6	15.8	-96%	17.2	10.0	72%	17.8	25.8	-31%

Note : Amounts less than 0.1 mm are rounded off to zero

TABLE 2

## Details of the weather systems during January 2022

S. No.	System	Duration	Place of initial Location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>(A) Western disturbances /Eastward moving systems</b>						
<i>(i) Upper air cyclonic circulation</i>						
1.	Upto 3.1 kms a.s.l.	5-6	Afghanistan and neighbourhood	Northeast	North Pakistan and adjoining Punjab	Initially, it lay as a trough in westerlies in lower and middle tropospheric levels with its axis at 5.8 km above m. s. l. and ran roughly along Long. 50° E to the north of Lat. 30° N on 3 morning. With a trough aloft in westerlies with its axis at 5.8 km above m.s.l. Moved away east northeastwards on 7
2.	At 3.1 km a.s.l.	6-14	Western parts of Afghanistan and neighborhood	East	Haryana and neighbourhood	With a trough aloft in upper tropospheric level with its axis at 5.8 kms above m.s.l. ran roughly along Long. 56° E to the north of Lat. 24° N on 6. The cycir became less marked on 15. The trough moved away east-northeastwards on 13
3.	Do	19-21	Afghanistan and neighborhood	Northeast	North Pakistan and neighbourhood	Initially, it lay as a trough with its axis at 3.1 km above m. s. l. ran roughly along Long. 60° E to the north of 32° N on 19. Merged with the western disturbance as a cyclonic circulation over north Pakistan and neighbourhood on 22
4.	Do	22-26	North Pakistan and neighbourhood	East	Northwest Uttar Pradesh and neighbourhood	Initially, it lay as a trough with its axis at 5.8 km above m.s.l. ran roughly along Long. 50° E to the north of Lat. 32° N.  On 21 morning. The cycir lay with a trough aloft with its axis at 5.8 km above m.s.l. the cycir became less marked on 27 and the trough aloft became less marked on 29
<i>(ii) As a trough</i>						
1.	Between 4.5 & 5.8 kms a.s. l.	1	Roughly along Long. 72° E to the north of Lat. 32° N	Stationary	<i>In situ</i>	Moved away east northeastwards on 2
2.	At 5.8 km above m.s.l.	13-14	Roughly along Long. 72° E to the north of Lat. 32° N	East	Long. 75° E to the north of Lat. 32° N	Moved away east northeastwards on 15
3.	Between 3.1 and 5.8 km above m.s.l.	28-31	Roughly along Long. 54° E to the north of Lat. 33° N	Do	Roughly along Long. 71° E to the north of Lat. 33° N	Moved away east-northeastwards on 1 February
<i>(iii) As an induced cyclonic circulation/induced low pressure</i>						
1.	Upto 0.9 kms a.s.l.	4-12	Southwest Rajasthan and adjoining Pakistan	Northeast	Northwest Uttar Pradesh and neighbourhood	Became less marked on 13
2.	Do	20-21	Central parts of Rajasthan and neighbourhood	East	Central parts of Madhya Pradesh	Became less marked on 22
3.	Well marked low pressure	22-23	West Rajasthan and neighbourhood	North	Northwest Rajasthan and neighbourhood	Initially, it lay as an induced cyclonic circulation over south Pakistan and adjoining southwest Rajasthan. became less marked on 23 and the cyclonic circulation associated with low pressure area became less marked on 24

TABLE 2 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>(B) Other upper air cyclonic circulations</b>						
1.	Upto 3.1 km a.s.l.	1-4	Central Bangladesh	East	East Bangladesh and neighbourhood	Became less marked on 5
2.	At 1.5 km a.s.l.	2	Southwest Rajasthan and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 3
3.	Between 1.5 and 2.1 km above m.s.l.	10-17	North Konkan and neighbourhood	South	Kerala and neighbourhood	Became less marked on 18
4.	Upto 1.5 kms a.s.l.	9-14	Equatorial Indian ocean adjoining central parts of south Bay of Bengal	Northwest	Southwest and adjoining southeast Bay of Bengal	Became less marked on 15
5.	Upto 0.9 km a.s.l.	12-14	South Tamil Nadu and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 15
6.	Upto 3.1 kms a.s.l.	15	West Uttar Pradesh and neighbourhood	Do	Do	Became less marked on 16
7.	Do	18-21	North Bangladesh and neighbourhood	Do	Do	Became less marked on 22
8.	Upto 1.5 km a.s.l.	17	West Rajasthan and neighbourhood	Do	Do	Became less marked on 18
9.	At 3.1 km a.s.l.	17	Southwest Bay of Bengal off north Tamil Nadu coast	Do	Do	Became less marked on 18
10.	Upto 1.5 km a.s.l.	24	North interior Karnataka and neighbourhood	Do	Do	Became less marked on 25
11.	Do	24	Jharkhand and neighbourhood	Do	Do	Became less marked on 25
12.	Do	25	Comorin area and neighbourhood	Do	Do	Became less marked on 26
13.	At 3.1 kms a.s.l.	29	Gulf of Mannar and neighbourhood	Do	Do	Became less marked on 30
14.	Between 2.1 and 3.6 km a.s.l.	31	South Assam and neighbourhood	Do	Do	Became less marked on 1 February
<b>(C) Troughs in easterlies</b>						
1.	At 0.9 km a.s.l.	20	Central parts of south Bay of Bengal to central Bay of Bengal	Stationary	Do	Became less marked on 21
2.	Upto 0.9 kms a.s.l.	25-27	From south Tamil Nadu to Rayalaseema	West	From south Tamil Nadu to south interior Karnataka	Became less marked on 28
<b>(D) Other troughs</b>						
1.	At 0.9 km a.s.l.	8-10	From the cyclonic circulation over east Rajasthan and neighbourhood to southwest Madhya Pradesh	Stationary	<i>In situ</i>	Became less marked on 11
2.	At 1.5 km a.s.l.	11	From the cyclonic circulation over north Konkan and neighbourhood to Jharkhand	Do	Do	Became less marked on 12

TABLE 2 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
3.	Upto 0.9 km a.s.l.	2	From Gulf of Mannar to southwest Bay of Bengal off Sri Lanka coast w	Stationary	<i>In situ</i>	Became less marked on 3
4.	At 0.9 kms a.s.l.	10-14	From north interior Karnataka to north Madhya Maharashtra	East	From north interior Karnataka to north interior Odisha	Became less marked on 15
5.	At 5.8 km a.s.l.	15-16	Roughly along Long. 82° E to the north of Lat. 22° N	Do	Roughly along Long. 90° E to the north of Lat. 22° N	Moved away east-northeastward on 17 morning
6.	At 2.1 kms a.s.l.	23	From Bihar to north Odisha across Jharkhand	Stationary	<i>In situ</i>	Became less marked on 24
7.	At 0.9 kms a.s.l.	23	From the cyclonic circulation over Haryana and neighbourhood to north Chhattisgarh	Do	Do	Became less marked on 24
8.	At 1.5 km a.s.l.	24	From the cyclonic circulation over Punjab to the cyclonic circulation over Jharkhand and neighbourhood	Do	Do	Became less marked on 25 morning
9.	Between 1.5 and 2.1 km above m.s.l.	27	Roughly along Long. 92° E to the north of Lat. 21° N	Do	Do	Became less marked on 28

### 3. Monthly features

#### 3.1. January

##### 3.1.1. Storms and Depressions

No intense system formed over the Indian seas during the month.

##### 3.1.2. Weather and associated synoptic features

As given in Table 2, 10 western disturbances (including 4 upper air cyclonic circulations, 3 troughs in westerlies, 2 induced cyclonic circulations and 1 well marked low pressure), 14 other upper air cyclonic circulations, 2 troughs in easterlies and 9 other troughs formed, which affected the weather over the country during the month of January.

##### 3.1.3. Monthly rainfall

The westerly winds regime dominated the overall weather during most parts on January. Intense western disturbances along with their induced systems affected northwest India and adjoining areas of central India during the second and fourth week of the month causing fairly

widespread to widespread, intense precipitation over these areas. A very intense western disturbance as a cyclonic circulation with a long amplitude trough aloft, at mid and upper troposphere was observed in the second week of the month. As the western disturbance moved eastwards across northwest India, wet spell occurred over northwest and adjoining central India; also dense fog/low clouds were observed over some locations in these areas. This system moved very slowly to eastern parts of India and interacted with lower level tropical easterlies, resulting in very high moisture feed, both from Arabian sea and Bay of Bengal which sustained the wet spell for a longer period. As a result, cold day to severe cold day conditions were reported at isolated places over these areas during the same period. Remnants of the western disturbances caused fairly widespread rainfall associated with thunderstorms over northeast India. Under the influence of cyclonic circulations / troughs in the lower tropospheric levels, rainfall / thunderstorms occurred in the second fortnight of the month over most parts of peninsular India, resulting in rainfall over the country and all the four homogenous regions being above normal. In the homogenous region of northwest India, all the 9 sub-divisions recorded large excess rainfall, 78% of the area of the country (24 sub-divisions) received large excess rainfall. This resulted in some stations receiving record

TABLE 3

## Details of the weather systems during February 2022

S. No.	System	Duration	Place of initial Location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>(A) Western disturbances / Eastward moving systems</b>						
<i>(i) Upper air cyclonic circulation</i>						
1.	Between 3.1 and 5.8 km above m.s.l.	22-24	Northwest Afghanistan and neighbourhood	East	Jammu-Kashmir and Ladakh, adjoining north Pakistan	Initially, it lay as a trough in mid & upper tropospheric westerlies with its axis at 5.8 km a.s.l and along Long. 53° E and to the north of Lat. 28° N on 21. Became less marked on 25. The trough became less marked on 26
2.	At 5.8 km a.s.l.	24-26	Northeast Afghanistan and neighbourhood at 5.8 km above m.s.l.	Do	North Pakistan and neighbourhood	It then lay as a trough in middle and upper tropospheric westerlies with its axis at 5.8 km above m.s.l. which moved away east-northeastward on 28
<i>(ii) As a trough in westerlies</i>						
1.	At 5.8 km a.s.l.	6-8	Along Long. 52° E to the north of Lat. 30° N	East	Along Long. 65° E to the north of Lat. 28° N	Moved away east-northeastward on 9
2.	Do	8-12	Along Long. 58° E to the north of Lat. 30° N	Do	Along Long. 90° E to the north of Lat. 25° N	Moved away east-northeastward on 13
3.	Do	17-18	Roughly along Long. 55° E to the north of Lat. 30° N	Do	Roughly along Long. 70° E to the north of Lat. 30° N	Moved away northeastward on 19
4.	Do	27 Feb evening to on 1 Mar	Roughly along Long. 52° E to the north of Lat. 30° N	Do	Roughly along Long. 70° E to the north of Lat. 30° N	Moved away northeastward on 2 March
5.	Between 3.6 and 5.8 km above m.s.l.	21	Roughly along Long. 90° E to the north of Lat. 22° N	Stationary	<i>In situ</i>	Moved away east-northeastward on 22
6.	At 1.5 km a.s.l.	28 Feb	Roughly along Long. 89° E to the north of Lat. 22° N	East	Roughly along Long. 90° E to the north of Lat. 22° N	Became less marked on 1 March
7.	At 5.8 km a.s.l.	27 Feb evening to 1 Mar	Roughly along Long. 52° E to the north of Lat. 30° N	Do	Roughly along Long. 70° E to the north of Lat. 30° N	Moved away northeastward on 2 March
<i>(iii) As an induced cyclonic circulation/low pressure</i>						
1.	Low pressure	3	West Rajasthan and neighbourhood	Northeast	North Rajasthan, adjoining Haryana on 4 morning and then became less marked	Initially, it ran as an induced cyclonic circulation lay over southwest Rajasthan and adjoining Pakistan which extended up to 1.5 km above m.s.l. on 2 evening. The low pressure became less marked on 4(morning). The associated cyclonic circulation became less marked on 6.
2.	Upto 1.5 km a.s.l.	7-8	Do	Do	Northeast Rajasthan and neighbourhood	Became less marked on 9 morning
3.	Upto 1.5 km above m.s.l.	13-15	Southwest Rajasthan and neighbourhood	-	-	It lay as a cyclonic circulation over south Gujarat and neighbourhood extending up to 1.5 km above m.s.l. on 15 which became less marked on 16
4.	Do	18	Southwest Rajasthan and adjoining Pakistan	Stationary	<i>In situ</i>	Became less marked on 19

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**TABLE 3 (Contd.)**

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	Upto 1.5 km a.s.l.	22 Morning -23	South Pakistan and adjoining southwest Rajasthan	Northeast	Punjab and neighbourhood	Became less marked on 24
6.	Upto 1.5 km above m.s.l.	25-26	Southwest Rajasthan and adjoining Pakistan	North	Central parts of Rajasthan and adjoining Pakistan	Became less marked on 27 morning
<b>(B) Other upper air cyclonic circulations</b>						
1.	Upto 1.5 km a.s.l.	1-2	Northeast Bangladesh and neighbourhood	Stationary	<i>In situ</i>	Initially, it ran as a trough roughly along Long. 90° E to the north of Lat. 24° N. a trough aloft roughly along Long. 93° E to the north of Lat. 24° N at 3.1 km. a.s.l. It became less marked on 3
2.	At 0.9 km above m.s.l.	3	Comorin area and neighbourhood	Do	Do	Became less marked on 4
3.	At 0.9 km a.s.l.	3	West Assam and neighbourhood	Do	Do	Became less marked on 4
4.	Upto 1.5 kms a.s.l.	8	Madhya Maharashtra and adjoining Marathwada	Do	Do	Became less marked on 9
5.	At 0.9 km a.s.l.	5	South Kerala and neighbourhood	Do	Do	Became less marked on 6
6.	At 3.1 kms a.s.l.	9-10	Southwest Bay of Bengal off Sri Lanka coast	East	Comorin area and neighbourhood	Became less marked on 11
7.	Upto 3.1 km a.s.l.	14	Bangladesh and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 15
8.	Upto 4.5 kms a.s.l.	16-19	Equatorial Indian ocean and adjoining southeast Bay of Bengal	North	Southeast Bay of Bengal and adjoining north Andaman Sea	Initially, it lay as a trough in easterlies roughly along Long. 94° E which extended up to 1.5 km above m.s.l. on 15. Became less marked on 20
9.	Between 1.5 km and 3.1 km above m.s.l.	20	Southeast Arabian Sea and adjoining Kerala coast	Stationary	<i>In situ</i>	Became less marked on the same day evening
10.	Upto 0.9 km a.s.l.	18-19	Madhya Maharashtra and neighbourhood	Do	Do	Became less marked on 20
11.	At 0.9 km a.s.l.	21-24	Bangladesh and neighbourhood	East	East Bangladesh and neighbourhood	Became less marked on 25
12.	At 1.5 km a.s.l.	22	North Haryana and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 22 evening
13.	Between 1.5 and 3.6 km above m.s.l.	23	Comorin area and neighbourhood	Do	Do	Became less marked on 24
14.	Upto 0.9 km a.s.l.	23	South interior Karnataka and neighbourhood	Do	Do	Became less marked on 24
15.	Upto 1.5 km a.s.l.	23-25	Southwest Rajasthan and neighbourhood	East	North Odisha and neighbourhood	Became unimportant on 26
16.	At 0.9 km a.s.l.	26	East Bangladesh and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 27

TABLE 3 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>(C) Trough in easterlies</b>						
1.	At 0.9 km a.s.l.	1-2	From south Kerala to north interior Karnataka	Stationary	<i>In situ</i>	Became less marked on 3
2.	Upto 0.9 km a.s.l.	6-8	From south Kerala to south interior Karnataka	Oscillatory	From north Kerala to cyclonic circulation over Madhya Maharashtra and adjoining Marathwada	Became less marked on 9
3.	At 0.9 km a.s.l. (feeble)	11-12	Comorin Area	West	-	It lay as a cyclonic circulation over Maldives area on 13 <sup>th</sup> which became less marked on 14
<b>(D) Other Troughs/ Wind Discontinuity</b>						
1.	Upto 1.5 km a.s.l.	4	From southwest Bihar to north Telangana across Chhattisgarh and Vidarbha	Stationary	<i>In situ</i>	Became less marked on 5
2.	Do	4	From the cyclonic circulation over north Haryana and neighbourhood to southwest Bihar	East	From northeast Uttar Pradesh to north Bangladesh	Became less marked on 6
3.	At 1.5 km a.s.l.	9	From the induced cyclonic circulation over northeast Rajasthan and neighbourhood to north interior Karnataka	Stationary	<i>In situ</i>	Became less marked on 10
4.	At 0.9 km above m.s.l.	13	From the cyclonic circulation over Maldives area to north coastal Karnataka	Do	Do	Became less marked on 14
5.	Upto 1.5 km above m.s.l.	17	From north Kerala to Marathwada which	Do	Do	Became less marked on 18
6.	At 3.1 kms a.s.l.	20	Roughly along Long. 92° E to the north of Lat. 26° N	Do	Do	Became less marked on 20 evening
7.	At 0.9 km a.s.l.	20	From east Bihar to east Vidarbha across Jharkhand and Chhattisgarh at 0.9 km above m.s.l. on 20	Do	Do	Became less marked on 21
8.	Upto 0.9 km above m.s.l.	21	From north interior Karnataka to Kerala	Do	Do	Became less marked on 22
9.	Upto 1.5 km above m.s.l.	23	From induced cyclonic circulation over Punjab and neighbourhood to northwest Madhya Pradesh	Do	Do	Became less marked on 24



24-hour rainfall in this month. A list of such stations is furnished herewith their previous records and dates.

Station	24 hr. record rainfall in January 2022 (mm)	Date	Previous rainfall record (mm)	DD-MM-YYYY
Barapani	26.4	20	19.4	08-01-1976
Tuensang	20.4	27	14.6	16-01-1974
Bolangir	48	12	45.6	09-01-1995
Malkangiri	34.2	13	26.4	13-01-1908
Rampur	24	10	23.6	23-01-2015
Gurgaon	46.8	8	28.8	29-01-1986
Kapurthala	92.5	6	40.6	28-01-1983
Sangrur	21.6	6	17	24-01-1981
Delhi Ridge	48	8	36.8	16-01-2002
Alwar obs.	38.8	8	34	29-01-1983
Anupgarh	34	6	19	06-01-1999
Jaipur Tehsil SR	19	8	17	10-01-1981
Vidisha AWS	27	7	17	06-01-2004

Source : IMD Climate Diagnostics Bulletin of India January 2022

Out of the 36 meteorological sub-divisions of India, the month's rainfall was *large excess* in 24, *excess* in 1, *normal* in 4, *deficient* in 1 and *large deficient* in 6 sub-divisions.

### 3.1.4. Temperature

Maximum temperatures were generally normal over the country with below normal temperatures over northwest and adjoining central India.

The minimum temperatures were *above normal* over western parts of northwest India, parts of the northeast and east coast of peninsula, while the night temperatures were generally normal over the rest of the country. The season's lowest minimum temperature over the plains of the country was 1.6 °C at Hissar (Haryana) on 2<sup>nd</sup> January, 2022.

Severe cold wave / cold wave conditions were observed in the first week over Punjab, Haryana and northeast Rajasthan for 1 to 2 days and again in the last week of the month over northwest India, *viz.*, Punjab, Haryana and east Rajasthan.

Cold wave conditions were observed during 20-26 January at a few places over Gujarat State, Madhya Pradesh and east Rajasthan. During the last week of January, severe/cold wave conditions were observed over Madhya Pradesh, east Rajasthan, Vidarbha and Marathwada on one to three days.

*Severe cold days to cold days* were observed in the north Indian sub-divisions of Punjab, Haryana,

Chandigarh, Delhi, Rajasthan, Uttarakhand and Uttar Pradesh on some days and over Madhya Pradesh and Chhattisgarh on a few days.

### 3.1.5. Damages associated with Disastrous weather events

As per media reports, continuous snowfall in Kashmir badly affected surface and air traffic, several universities in the valley postponed their examinations. One person died and one injured when the wet spell dislodged a boulder and hit a car near Jaswal bridge in Ramban district of Jammu-Kashmir and Ladakh. Unseasonal rain and hailstorms caused heavy damage to *rabi* crops, *viz.*, wheat, gram, maize, sunflower and fruit crops, *viz.*, banana, papaya in Dhule, Latur and Nanded districts of Marathwada in Maharashtra. Roofs of many houses in Billoli district in Marathwada were blown away due to strong winds. Unseasonal rains and hailstorms caused heavy damage to *rabi* crops including pulses, *viz.*, wheat, gram, maize, cotton, tur, peas, jowar in Vidarbha; damage to crops over more than 70,000 to 80,000 hectares were reported in Vidarbha. Rains also took a toll of one person in Nagpur, led to damage of 70 houses in Wardha district and 27 in Nagpur, Vidarbha in Maharashtra.

## 3.2. February

### 3.2.1. Storms and depressions

No intense system formed over the Indian seas during the month.

### 3.2.2. Other synoptic features and associated weather

As given in Table 3, 15 western disturbances (including 2 upper air cyclonic circulations, 7 troughs in westerlies and 6 induced systems including 1 well marked low pressure), 16 upper air cyclonic circulations, 3 trough in easterlies and 9 other troughs/wind discontinuities formed, which affected the weather over the country during the month of February.

Rainfall over the country during the month was below normal over all the regions and the country except east and northeast, where it was above normal (161% of LPA). Under the influence of an intense western disturbance and its induced system, parts of northwest India including Western Himalayan Region had experienced weather activity in the first week of February and during its course of movement east-northeastwards the system caused fairly widespread to widespread rainfall/thunderstorm activity over parts of east and northeast India.

TABLE 4

Some representative amounts of rainfall in cm for January and February 2022 (3 cm and above)

Date	Some representative amounts of rainfall in cm for January and February 2022 (3 cm and above)
1 Jan	Red Hills and Cholavaram 10 each, Vedaranyam and Uthukottai 9 each, Chidambaram, Koratur, Kancheepuram, K. m. koil and Perambur 7 each, Thiruthuraiipoondi, Bhuvanagiri, Chidambaram AWS, Kollidam, Ammundi and Virinjipuram AWS 6 each, Ennore AWS, Ambathur, Tirupati AP, Parangipettai, Thamaraiakkam, Kurinjipadi, Dgp Office, Gudiyatham, Katpadi and Cheyyur 5 each, Cheyyar, Muthupet, Agaram Seegoor, Adirampatnam, Viralimalai, Jayamkondam, Virudachalam, Sirkali, Chennai (n), Mayiladuthurai, Cuddalore and Uthiramerur 4 each, Chengalpattu, Tindivanam, Maduranthagam, Vanur, Mahabalipuram, Anna University, Senapparai, Srimushnam, Vellore, Vepur, Sankarapuram, Dindigul, Arimalam, Ulundurpet, Manalmedu, Thanjavur, Pattukottai, Peravurani, Manjalaru, Tirupoondi, Tirumayam, Keeranur and Coonor PTO 3 each
2 Jan	Peravurani 22, Muthupet and Pattukottai 18 each, Adirampatnam 16, Tirumayam and Alangudi 13 each, Pudukottai 12, Madukkur and Natham 11 each, Arimalam and Dindigul 10 each, Ponnamaravathi, Manalmedu, Mayiladuthurai and Thanjavur 9 each, Annavasal, K. m. koil and Thiruthuraiipoondi 8 each, Perambalur, Ariyalur, Jayamkondam, Tirupoondi, Vedaranyam, Thalaignayer, Sirkali, Tiruvarur, Valangaiman and Kodavasal 7 each, Ayyampettai, Chettikulam, Agaram Seegoor, Nagapattinam and Pandavaiyar Head 6 each, Tiruvaiyaru, Mannargudi, Nannilam, Marungapuri, Pullambadi, Samayapuram, Thanjavur PTO, Thuraiyur, Avudayarkoil, Manjalaru, Senduraiand Kodaikanal 5 each, Thanjai Papanasam, Lalgudi, Panchapatti, Labbaikudikadu, Orthanad, Arantangi, Manimutharu, Ambasamudram, Gandarvakottai, Tirukattupalli, Thiruvidadimaruthur, Budalur and Tirupathur 4 each, Cheranmahadevi, Padalur, Erumapatti, Pulipatti, Needamangalam, Karaikal, Kumbakonam and Nilakottai 3 each
3 Jan	Rameswaram 10, Mandapam and Pamban 5 each, Manimutharu 3
4 Jan	Nil
5 Jan	Dalhousi Alha AWS, Manali, Banihal and Batote 4 each, Bhuntar AP, Seo Bagh, PTO Koksar, Gulmarg R S and Udampur (IAF) 3 each
6 Jan	Jammu A P and Kapurthala 9 each, Amb, Gurdaspur AMFU, Ghamroor, Mukerian, Kathua and Tibri 8 each, Dhariwal Irr, Phangota, Gurdaspur AWS, Gurudasapur, Shahpur Kandi, Batote, Kothi, Madhopur, Rajhani AWS and Udampur (IAF) 7 each, Nagrota Surian, Guler, Dharmshala AWS, Mehre (barsar), Kheri, Palampur, Bangana R, R L Bbmb, Bangana F, Katra, Samba AWS, Banihal and Badarwah 6 each, Pachhad, Jogindarnagar, PTO Koksar, Una Rampur AWS, Nahan, Jammu, Dharampur, Govindpura AWS, Sangraha, Sujampur Tira, Una, Nadaun, Saloni, Kawa AWS, Chawari, Tissa, Suratgarh, Joshimath, Naina Davi, Anandpur Sahib, Faridkot, Ranjit Sagar Dam Site, Makrana S R and Muktsar 5 each, Chamba AWS, Chaupal, Dalhousi Alha AWS, Renuka/Dadhau, Kasauli, Pahalgam, Dasuya, Gulmarg R. s., Rajouri, Mori, Dhanauli, Chakrata, Mussoorie, Sangaria S R, Jattoon Barrage, Manali, Kangra A P, Dehra Gopipur, Berthin Agro, Dharmasala, Baijnath, Barthin, Aklera, Kumbhraj, Seo Bagh, Nawaand HMO Kasol 4 each, Parbatsar, Chandigarh AWS, Anupgarh, Kahu, Karnaprayag, Aghar, Gairsain, Sundarnagar, Qazi Gund, Chandigarh, Bilaspur, Kandaghat, Amritsar Irr, Derabassi (basi), Bakani SR, HMO Hansa, Bhuntar AP, Srivijaynagar SR, Muktsar AWS, Rajpura, Anupgarh Tehsil S R, Patiala and Athwal Irr 3 each
7 Jan	Karwi 7, Orchha, Rajnagar, Kundaand Ajaigarh 5 each, Kapurthala, Bhopal Arera Hills, Mahroni, Maudaha, Chahtarpur Khajuraha AP and Tikamgarh-aws 4 each, Mau Tehsil, Mihona, Roan, Nowgong, Lavkushnagar, Pathari, Shajapur and Lalitpur 3 each
8 Jan	Udhampur (IAF) 12, Jammu AP 10, Kapurthala, Katra and Orchha 9 each, Badarwah, Banihaland Jammu 8 each, Rajouri, Govindpura AWS, Samba AWS, Kawa AWS, Pusa AWS, Sohana, Nimarana, Behror, AthwalIrr and Batote 7 each, Pilavakkal, Taoru, Kishngarhwas S R, Phangota, Pathankot IAF, Gurdaspur AMFU, Rajhani AWS, Rs Pura ARG, Patharia and Jammu AWS 6 each, Assandh, Srimadhampur, Kathua, Chomu, Chhachrauli ARG, Jagadhari, Dadupur, Taran Taran, Pichhore, Batala, Dhariwal Irr, Tibri, Gurudasapur, Jalandhar, Gurdaspur AWS, Jansath, Niwari, Dalhousi Alha AWS, Kheri, Aya Nagar, Ayanagar AWS, Palam, Delhi Ridge, Gurgaon, Gurgaon REV, Manesar REV, Nahan and Adampur IAF 5 each, Viratnagar S R, Srinagar A P, Muzaffarnagar Teh, Chawari, Qazi Gund, Mauranipur, Maudaha, Srinagar, Ernakulam South, Khanna, Samrala, Madhopur, Ranjit Sagar Dam Site, Shahpur Kandi, Shahpura S R, Nangal, Amb, Tibi S R, Sarwar, R L Bbmb, Pachhad, Alwar Obs, Banda, Nakodar ARG, Chabra, Fatehpur, Deoband, Ajmer, Phagwara, Dhansa, Safdarjung, President House, Delhi Univrsity Obs, Sps Mayur Vihar, Green Field Ps, Narela, Najafgarh AWS, Amritsar Hmo, Jafarpur AWS, Naraingarh, Nuh, Narnaul REV, Faridabad, Narnaul, Pataudi, Lodi Road, Sahlawas, Lodi Road AWS, TalwandiBhai, Amritsar Irr, Kalyanpur, Sagar Shirpur, Zira, Ferozepur, Chahtarpur and Bhatinda IAF 4 each, Kukernagh, Rajgarh, PTO Gondla, Farukhnagar, Begumganj, Mehre (barsar), Badli REV, Bahadurgarh, Renuka/Dadhau, Chandigarh IAF, Arki, Sangraha, Kasauli, Una, Una Rampur AWS, Gulmarg R. s., Sarangpur, Nowgong, Prithvipur, Beri, Hoshiarpur, Porbandar, Mungeshpur AWS, Budhana, Naina Davi, Rasulpur Irr, Bahadurpur S R, Vijaynagar S R, Amritsar, Mangliawas S R, Makrana S R, Rajgarh/Sadulpur, Dungargarh, Balachaur, Alwar S R, Anandpur Sahib, Jandiala Irr, Ropar, Rajpura, Patiala REV, Ranewali Irr, Fatehgarh Sahib ARG, Bamori, Sonapat, Kharkoda, Rampur Maniharan, Jhirka, Pilukhera, Guhla, BullIrr, Kalayat, Mahoba, Jhansi, Rath, Etah, Neemkathana S R, Kotkasim S R, Kalka, Nagina REV, Bawal, Kosli, Palhawas REV, Tizara S R, Manethi REV, Bilaspur and Kukshi 3 each
9 Jan	Bul Irr 13, Nakur 10, Jagraon, Phangota, Paowta and Bijnor 9 each, Batote 8, Chandpur, Bapouli, Kotdwar, Kotkasim S R, Tehri (CWC), Udhampur (IAF), Nakodar ARG, Kheri and Hapur 7 each, Dhansa, Gharaunda, Palwal, Chhachrauli ARG, Samalkha, Lakhnamajra REV, Kapurthala, Dhampur, Phagwara, Bangana F, Bangana R, Samana, Nagar SR, Tehri, Naina Davi, Saharanpur, Dausa, Ludhiana Irr, Hardwar, Mussoorie, Dhanauli and Deoprayag 6 each, Ganaur, Dehra Gopipur, Gohana, Chamba AWS, Bharmaur, Amroha, Madluda REV, Khanpur REV, Barthin, Dadupur, Tajewala, Handiaya Hmo, Amloh, Dhariwal Irr, Tibri, Sikandarabad, Banda, Deeg S R, Samana ARG, Patiala, Nabha, Kathumer, Madhopur, Samrala, Ludhiana, Sujampur Tira, Pen, Mirganj, Baheri, Rishikesh, Pauri, Najibabad (t), Srinagar, Nabha ARG, Sangraha, Khadralla, Banihal, Amloh ARG, Adampur IAF,

## WEATHER IN INDIA

TABLE 4 (Contd.)

Date	Some representative amounts of rainfall in cm for January and February 2022 (7 cm and above)
	Rajgarh, Kaithal, Barkot, Jatton Barrage, Pachhad, Kufri AWS, Dunda, Pehowa, Kurukshetra, Jhirka, Karnal REV, Badarwah, Mori and Thanesar 5 each, Una Rampur AWS, Ranikhet (g), Anandpur Sahib, Katra, Kawa AWS, Sahaswan, Kurukshetra AWS, Gairsain, Alwar Obs, Nawanshahr, Alwar S R, Ludhiana AWS, Hoshiarpur, Ramgarh S R, Derabassi (basi), Kangra A P, Una, Berthin Agro, Dharmshala AWS, Mehre (barsar), Dharmshala, Nagrota Surian, Nadaun, HMO Shillaro, Buxwaha, Narendranagar, R L Bbmb, Bilaspur Sadar, Nahan, Solan, Rampur Maniharan, Pawai, Renuka/Dadhau, Arki, Kanth, Bilari, Kandaghat, Guler, Mawana, Amb, Chawari, Nangal, Ropar, Sonapat, Mukerian, Dasuya, Babain REV, Partapnagar REV, Radaur, Jagadhari, Chhachhrauli, Rai REV, Lansdown, Ambala REV, Farukhnagar, Tiuni, Bahadurgarh, Jind, Hodal, Punhana, Kurukshetra Kvk AWS, Guhla, Jhansairr, Jalandhar, Barnala, Ismailabad, Khanna, Chakrata, Patiala AWS, Shahpur Kandi, Bhadson Irr, Haripur, Ranjit Sagar Dam Site, Pathankot IAF, Uttarkashi (CWC), Roorkee, Dehra Dun, Payal REV, Doraha Irr, Jollygrant, Purola, Halwara IAF and Uttarkashi 4 each, Prabhat Pattan, Rajaund, Kalayat, Paonta, Jaspur, Khirkiya Godadongri, Dharampur, Alewa REV, Bhiwani, Beri, Govindpura AWS, Uklana REV, Kurwai, Bareli, Pataudi, Shalimar Agro, Chandigarh, Dadri, Keertinagar, Chandigarh AWS, Chandigarh IAF, Ambala, Bharari, Kotkhai, Umreth, Rajpura, Bahadurpur SR, Betul, Pahari S R, Bareilly PBO, Nawabganj, Channodi, Lakhnadon, Nagode, Gurdaspur AMFU, Garhshankar, Meerut, Fatehgarh Sahib, Sirhind, Harrai, Shahbad, Panchkula AWS, Sundarnagar, Baldwara, Ateli, Hassanpur, Yamkeshwar, Nagina REV, Panipat, Kahu, Rauni AWS, Tissa, Saloni, Aghar, Dalhousi Alha AWS and Bilaspurand Atner 3 each
10 Jan	Kandaghat 8, Dharampur and Solan and Pachhad 7 each, Venkatnagar, Shimla A P, Renuka/Dadhau, Saharanpur, Bijnor, Bharmaur, Sangraha, Kasauli, Pawai, Khadralla and Rajgarh 6 each, Banjar, Kothi, Kufri AWS, Naina Davi, Jatton Barrage, Joiti, Baldwara, Nahan, HMO Shillaro, Moradabad, Sundarnagar, Amroha, Arki, Kalka, Morni, Panchkula, Chhachhrauli, Karwi and Dadupur 5 each, Mandi, Gonour, Kotkhai, Karsog, Kumarsain, Pandoh, Gohar, Chhachhrauli ARG, Haripur, PTO Gondla, Manali, Rampur Bushar, Naraingarh, Bhuntar A P, Barwala, Mau Tehsil, Sarahan, Buxwaha, Simla, Radaur, Kerameri, Tajewala and Nakur 4 each, Paonta, Saloni, Jogindarnagar, Baraut, Unchehra, Shahdole (sohagpur), Gairsain, Narayangarh ARG, Raipur Rani, Jagadhari, Partapnagar REV, Sawayajpur ,Suar, Janjehli, Rampur Maniharan, Bilha, Kahu, Jhandutta, Chamba AWS, Nichar, Bajura AWS, Seo Bagh and Bijahiand Jaspur 3 each
11 Jan	Ballarpur 9, Chandurthi, Bachhanpet and Chamorshi 7 each, Narsampet, Parvathagiri, Kondapak, Joiti and Palakurthi 6 each, Pombhurna, Bijuri, Gajwel, Kerameri, Saoli, Jangaon, Armori, Raghunathpalle, Sarangapur, Jagtial and Keshkal 5 each, Dhanora, Korpana, Gadchiroli, Mahasamund, Manpur, Chandrapur, Anuppur Bhaiyathan, Ramayampet, Lanjigarh, Kotagarh, Machareddy, Khanapur and Berinag 4 each, Nagari, Barghat, Pakhanjur, Durgkondal, Dharmasagar, Kurkheda, Narmetta, Asifabad, Jainoor, Mul, Laxmanchanda and Velagatoor 3 each
12 Jan	Kalinga 15, Atmakurwrgl 8, Jhorigam, Kondagaon, Bhuvanagiri, G Udayagiri, Chennaraopet, Salebhatta, Keshkal, Gudurwrgl and Makadi 7 each, Kothaguda, Jammikunta, Komna, Mainpur, Tikabali, Raikia, Narayanpur, Khanapur, Nallabelly, Bhamragad and Karimnagar 6 each, Shayampet, Karimnagar A P, Narsampet, Dharmasagar, Kharagpur (I.t), Bhongir (ARG), Jangaon, Nawapara, Mogullapalle, Jharsuguda, Pharasgaon, Agalpur, Belpada, Bolangir, Baderajpur, Khariar and Bhanupratappur 5 each, Parkal, Charama, Nerharpur, Kanker, Bhairamgarh, Konaraopeta, Boinpalle, Hanamkonda, Bejjur, Gangadhara, Orcha, Koderma, Ahiri, Simdega, Umarkote, Dum Dum, Chandahandi, Boden, Jujumura, Kolabira, Binika, Kirmira, Deogaon, Ullunda, Dunguripalli, Hemgiri, Tarva, Velagatoor, Kalaikunda (Iaf), Mohanpur and Patnagarh 4 each, Banki, Bhawanipatna, Lohandiguda, Nagari, Banarpal, Koksara, Raigarh, Antagarh, Manpur, Tikarpara, Gaisilet, Padampur, Komarada, Paikmal, Bakavand, Raghunathpalle, Perseoni, Kagaznagar, Choppadandi, Bhupalpalle, Huzurabad, Asifabad, Uluberia, Jainoor, Bijjar (ARG), Asifabad (ARG), Birmaharajpur, Etapalli, Kuchinda, Naktideul, Jamankira, Bamra, Daspalla, Angul, Tentulikhunti, Raighar, Nawarangpur and Barghat 3 each
13 Jan	Parvathagiri 10, Noothankal 8, Kollapur and Garla 7 each, Sandeshand Dornakal 6, Naraj, Khammam Urban, Lohandiguda, Pagidyala, Srungavarapukota, Suryapet, Nalgonda (ARG), Chandur, Kollapur (ARG), Govindaraopet, Nalgonda, Sathupalle, Kibithu, Shillongani AWS, Nalbari/Pagladia and B P Ghat 5 each, Nidamanur, Kunavaram, Hawaii, Gantyaada, Bhuvanagiri, Alampur, Chennaraopet, Kurnool, Bapatla, Bakavand, Kampasagar A P, Tadwai Mlg, Baderajpur and Tekulapalle 4 each, Malkangiri, Raighar, Kurupam, Bastar, Purushottampur, Makadi, Bheemunipatnam, Vijayawada A P, Khanapur, Vararamachandrapur, Monghyr, Srivilliputhur, Roing, Panbari, Mothey, Karimganj, Narsinghpur, Gundala, Mahabubabad, Gudurwrgl, Palawancha and Gannavaram A P 3 each
14 Jan	Parvathipuram 16, Seethanagaram 9, Garugubilli and Kotraguda 7 each, Bhuban, Nuagada and Jajireddigudem 6 each, Dornakal, Balajipeta, Bobbili, Tenali, Mangalagiri, Amaravatiand R. udaigiri 5 each, Kodakandla, Iaf Carnicobar, Venkatagiri, Mathili, Masulipatnam Cdr, Lamataput, Bondapalle, Ichchapuram, Ranastalam, Jiyamma Valasa, Chilkur and Kampasagar A P 4 each, Gajapathinagaram, Sukinda, Bhairamgarh, Kalinga, Vijayawada (ARG), Pathapatnam, Bayyaram, Gunupur, Repalle, Guntur, Kashinagar, Neredcherla, Chandrugonda, Garla, Yellandu and Usoor 3 each
15 Jan	Laikera, Poudi Uparora, Pandharia, Bodla and Choppadandi 5 each, Tadwai Mlg, Bondapalle, Sultanabad, Elagaid, Dharmaram, Pandhurna, Srirampur, Bhupalpalle, Gurundia, Takhatpur, Champua, Dharamjaigarh and Sausar 4 each, Visakhapatnam, Gajapathinagaram, Lalburra, Parkal, Mogullapalle, Lahunipara, Padmapur, Bissem-cuttack, Umalkote, Daringibadi, Kolabira and Lakkanpur 3 each
16 Jan	Noothankal 7, Saroornagar 6, Pilavakkal 5, Thenkasi, Atchampet and Srungavarapukota 4 each, Mothey, Suryapet and Aryankavu 3 each
17 Jan	Ambathurand Coonoor PTO 6, Coonoor 5, Nagapattinam and Marakkanam 4 each, Neredcherla, K Bridge and Kothagiri 3 each
18 Jan	Ennore AWS 5, Tirupoondi 4, MgrNagar 3

TABLE 4 (Contd.)

Date	Some representative amounts of rainfall in cm for January and February 2022 (7 cm and above)
19 Jan	Nil
20 Jan	LongIsland 4, Kabi 3
21 Jan	Nil
22 Jan	Fatehpur and PortBlair 4 each, Pattamundai 3
23 Jan	Udhampur (IAF) 9, Nahan 8, Kawa AWS 7, Khadralla, Panchkula AWS and Saharanpur 6 each, Jatton Barrage, Renuka/Dadhau, Chandpur, Amritsar Hmo, Chhachhrauli, Ladwa, Katra, Chandigarh AWS, Chandigarh IAF, Chandigarh, Tajewala and Barthin 5 each, Bijnor, Rampur Maniharan, Taran Taran, Ambala REV, Balachaur, Bilaspur Sadar, Ambala, Naina Davi, Hamirpur, HMO Shillaro, Nangal, Rajgarh, Kasauli, Solan, Una, Una Rampur AWS, Kurukshetra, Anandpur Sahib, Batote, Kurukshetra Kvk AWS, Phagwara, Kapurthala, Naraingarh, Amritsar, Dadupur, Jagadhari, Bilaspur, Thanesar, Amritsar Irr and Kalka 4 each, Panchkula, Chaupal, Paonta, Patiala REV, Morni, Baldwara, Ismailabad, Badarwah, Nilokheri, Karnal, Barara, Partapnagar REV, Sujanpur Tira, PTO Koksar, Fatehgarh Sahib, Pathankot IAF, Alwar Obs, Gurdaspur AMFU, Gurdaspur AWS, Mukerian, DhariwallIrr, Ferozepur, Kahu, Kothi, RLB bmb, Bharmaur, Chawari, Chhatrari, Aghar, Bharari, Mehre (barsar), Phangota and Nawanshahr 3 each
24 Jan	Bansi Tehsil 15, Kakrahi and Bansi CWC 10 each, Amroha 9, Khadralla 7, PTO Koksar, Baheri and Bhinga 6 each, Nangal, Sangraha, Chaupal, Chamba AWS, Naina Davi, Kakerdarighat, Nighasan, Bangana R and Phangota 5 each, Paradeep Cwr, Renuka/Dadhau, Kotdwar, Hardwar, Dharmasala, Bhoranj, Bharari, Ropar, R L Bbmb, Saharanpur, Moradabad, Bhuban, Anandpur Sahib, Chandigarh, Chanderdeepghat, Chandigarh AWS and Meja 4 each, Betalghat, Baldwara, Jubbal, Balachaur, Jatton Barrage, Kothi, Panchkula AWS, Kandaghat, Panposh, Kasauli, Amb, Bhagwanpur, Baijnath, Kangra AP, Dharmshala AWS, Morni, Chhatrari, Roorkee, Kalka, Jhandutta, Jhansalrr, Roshnabad, Barthin, Bilaspur, Chandigarh IAF and Bharmaur 3 each
25 Jan	Gajapathinagaram 5, Mangan, Merakamudidam and Sankalan 3 each
26 Jan	Sivagiri 3
27 Jan	Anini, Dharmanagar/Panisagar and Sivagiri 4 each, Periyakulam and Nambulipulikunta 3 each
28 Jan	Coonoor PTO 5
29 Jan	Nil
30 Jan	Hut Bay 7, Tirupoondi 5, Nagapattinam 3
31 Jan	Nil
1 Feb	Lohandiguda 5, Bhairamgarh and Kunkuri 4 each, Chhindgarh, Konta and Kabi 3 each
2 Feb	Kusmi 9, Shankargarh 6, Bhairamgarh 4, Majuli 3
3 Feb	Sabour 7, Kothi 5, Chawari and Sambhal 4 each
4 Feb	Mirganj 16, Jatton Barrage 10, Rajmahal 8, Borio, Renuka/Dadhau, Malda, Tantloi, Chawari, Haldwani, Nahan, Naina Davi, Thakurdwara, Messenjor and Moharo 6 each, Laksar, Bagaha, Chandan, Una, Dharchula, Chanderdeepghat, Simdega, Roorkee, Kusmi, Khadralla, Rampurhat (DRMS), Anandpur Sahib, Tajewala, Dadupur, Thanesar, Bargaon, Saloni, Chhachhrauli, Bijahi and PTO Koksar 5 each, Jhansa Irr, Phangota, Kolebira, Kurdeg, Jagadhari, Muhammadi, Palliakalan, Kurukshetra Kvk AWS, Duldula, Betanati, Deogaon, Saharanpur, Gairsain, Loharkhet, Radaur, Laikera, Mukteshwar, Betalghat, Kirmira, Babain REV, Champua, Nangal, Dharampur, Bilaspur Sadar, Sangraha, Dehra Gopipur, Amrapara, Kheri, Bhagalpur, Barari, Baltara, Patna Aerodrome, Dinara, Gohar, Tribeni/Balmikinagar, Sikatia, Giridih, Jarmini and Nandadih 4 each, Rajgangpur, Barthin, Amfu Majhian, Pathalgaon, Kapurthala, Lakhampur, Tilpara Barrage, Baijnath, Durgapur, Luchipur, Mehre (barsar), Jharsuguda, Chamba AWS, Mandira Dam, Dalhousi Alha AWS, Mohgaon, Karanjia, Bilaspur AWS, Amarpur, Pehowa, Kahu, Ropar, Tangarpali, Lathikata, Banaigarh, Pakuria, HMO Shillaro, Dhanaulti, Jamtara, Godda, Palganj, Barkisuraya, Ghatsila, Baheri, Gaunaha, Williamnagar AWS, Almora, Kapkot, Karnaprayag, Ramnagar, Chanpatia, Narendranagar, Pachhad, Tehri (CWC), Berinag, Solan, Munsiyari, Pithoragarh, Kashipur, Kasauli, Kandaghat, Shahbad, Ladwa, Bilaspur, Paonta, Sadhaura and Nichlaul 3 each
5 Feb	Ramnagar and Gaunaha 9 each, Williamnagar AWS 7, Kufri AWS, Canning, Bagodari and Sonbarsa 6 each, Halflong, Barobhisha, Amfu Majhian, Jaipur, Anini, Nh5 Gobindpur, Bhograi, Chanpatia, Sheikhpura, Chandbali, Chaupal and Bagaha 5 each, Digha, Goalpara PTO, Durgachack, Kamalpur, Roorkee, Contai, Burdwan PTO, Cooch Behar, Alipurduar (CWC), Alipurduar PTO, Bhuban, Goalpara CWC, Chengmari/Diana, Balasore, Khagadia, Dhubri CWC, Diamond Harbour, Jaleswar, Chepan, Barpeta, Dhubri IMD, Kessariah, Tuting and Mahedi/Mehshi 4 each, Bhadrak, Basudevpur, Jalpaiguri, Tihidi, Kalaikunda (laf), Bagati, Harinkhola, Dum Dum, Amfu Kakdwip, Jhandutta, Domohani, Manash Nh Xing, Bijahi, Simla, Chatia, Madhwapur, Rajmahal, Kakerdarighat, Kakrahi, Kalaktang, KabuBasti, Hazuah, Aie Nh Xing, Bagdogra IAF, Panbari, Mawsynram, Karimganj, Gossaigaon, Kokrajhar, Tinder, Senapati, Tamenglongi, Narendranagar, Mathabhanga and Alipingal 3 each
6 Feb	Tamenglongi 9 Saiha 7, Basar and Beki Mathungari 5 each, Hawai and Tangla 4 each, Kabi 3
7 Feb	Nancowry 3
8 Feb	HutBay 4

## WEATHER IN INDIA

**TABLE 4 (Contd.)**

Date	Some representative amounts of rainfall in cm for January and February 2022 (7 cm and above)
9 Feb	Amroha 9
10 Feb	Putki, Dhaurahara, Kasganj and Tantloi 4 each, Suri (CWC) and Mohgaon 3 each
11 Feb	Vedaranyam 7, Tirupoondi and Anini 5 each, Karaikal and Thiruthuraipoondi 3 each
12 Feb	Nagapattinam 10, Bhuvanagiri, Chidambaram and Parangipettai 9 each, Chidambaram AWS 8, Ernakulam, Mannargudi and Kollidam 7 each, Needamangalam, Sirkali, Tirupoondi, K. m. koil and Manalmedu 6 each, Karaikal, Sethiathope and Nannilam 5 each, Ayyampettai, Manjalaru, Thanjai Papanasam, Kodavasal, Pandavaiyar Head, Tiruvarur and Visakhapatnam 4 each, Jayamkondam, Kumbakonam, Thiruvaidimaruthur and Valangaiman 3 each
13 Feb	Vedaranyam 8, Neyyattinkara 6, Thiruthuraipoondi, Trivandrum A P, Tirupoondi, Pechiparai and Kuzhithurai 5 each, Perumkadavila ARG, West Kallada AWS, Airport Chakka ARG, Konni ARG and Kanjirappally 4 each, Manamelkudi, Mimisal, Ambasamudram, Papanasam and Haripad 3 each
14 Feb	Nil
15 Feb	Car Nicobar 4
16 Feb	Nancowry and Car Nicobar 5 each, Perumkadavila ARG and Iaf Carnicobar 4 each
17 Feb	Pechiparai 6, Perunchani Dam 5, Chittar, Long Island and Mangan 4 each, Sankalan and Singhik 3 each
18 Feb	Maya Bandar 4
19 Feb	Sompeta 6, Port Blair and Long Island 5 each, Tarangambadi 3
20 Feb	Sankalan 4, Car Nicobar, Long Island, Mangan and Singhik 3 each
21 Feb	Balipatna 5, Chauldhowaghat, Kantapada, Bhubaneswar A P and Sagar Island 3 each
22 Feb	Nil
23 Feb	Udhampur (IAF) 9, Shalimar Agro 8, Anantnag 7, Konibal, PTO Koksar, Srinagar, Banihal and Srinagar A P 6 each, Govindpura AWS, Katra, Badarwah, Kawa AWS, Batote and Kukernagh 5 each, Raj Pura ARG, Qazi Gund and Gulmarg R.s. 4 each, Rajouri, Pahalgam, PTO Gondla and Zainpora ARG 3 each
24 Feb	Anantnag, Banihal and Shalimar Agro 4 each, Anantnag AWS 3
25 Feb	Burmpur and Kansabati Dam 6 each, Kusmi and Shankargarh 5 each, Bankura (CWC), Kharidwar, Phulberia, Tusuma and Mawkyrwat 4 each, Baijnath and Tamenglongi 3 each
26 Feb	Anantnag AWS, Banihal and Bijnor 4 each, Badarwah and Udhampur (IAF) 3 each
27 Feb	Marwahi 5, Barkisuraiya and BulIrr 4 each, Jhandutta and Khadralla 3 each
28 Feb	Nancowry 9, Car Nicobar 8, Iaf Carnicobar 7, Alapuzha 5, Bijuri 4, Khadgava 3

During this month, out of 36 meteorological sub-divisions, 7 sub-divisions received *large excess* rainfall, 2 excess, 7 *normal*, 5 *deficient*, 8 *large deficient* rainfall and no rain in 7 sub-divisions. Table 1 shows the sub-division wise rainfall statistics (mm) for February 2022.

### 3.2.3. Temperature

The maximum and minimum temperatures were *below normal* over east and northeast India and they were generally normal over the rest of the country.

Some stations recorded the highest maximum temperature for the month. A list of such stations is given below with their previous records and date.

Station	24 hr. record rainfall in February 2022 (mm)	Date	Previous rainfall record (mm)	DD-MM- YYYY
Itanagar	15.2	2	13.7	17-02-2011
Asansol	9.8	25	7.5	13-02-1959
Malda	58.5	4	45	15-02-2014
Contai	40.0	5	36	26-02-1992
Kalaikunda (IAF)	32.6	5	29	14-02-2007

Source : IMD Climate diagnostics bulletin of India, February 2022

The lowest minimum temperature over the plains of the country was 1.8 °C reported at Hissar (Haryana) on 6 February 2022.

*Cold wave* conditions were observed for one or three days each, in isolated parts of central India, viz., Madhya Pradesh, Vidarbha and Odisha in the second week of the month.

3.2.4. *Damages associated with disastrous weather events and damage*

According to media reports, fog affected the movement of air traffic at Vijayawada; a thick layer of fog covered the city in the morning, making it difficult for flights to land or take off. Total 7 persons reportedly claimed to be dead due to snowfall in west Kameng district of Arunachal Pradesh in the first week of the month.

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**Appendix**

**Definitions of the terms given in ‘Italics’**

**(A) Rainfall**

(i) Percentage departure from normal

*Large excess* : + 60% or more

*Excess* : +20% to +59%

*Normal* : –19% to +19%

*Deficient* : –20% to –59%

*Large deficient* : –60% to –99%

*No Rain* : –100%

(ii) Intensity (during the 24 hours period ending at 0300 UTC)

*Heavy rainfall* : 6.5 cm to 11.5 cm

*Very heavy rainfall* : 11.6 cm to 20.4 cm

*Extremely heavy rainfall* : 20.5 cm and above

*Heavy snowfall* : 64.5 cm to 115.5 cm

**(B) Temperatures**

Cold Wave is considered when minimum temperature of a station is 10 °C or less for plains and 0 °C or less for Hilly regions

(a) *Based on Departure*

*Cold wave* : Negative Departure from normal is 4.5 °C to 6.4 °C

*Severe Cold Wave* : Negative Departure from normal is more than 6.4 °C

Based on Actual Minimum temperature (for plain stations only)

*Cold wave* : When minimum temperature is  $\leq 04$  °C

*Severe Cold Wave* : When minimum temperature is  $\leq 02$  °C

(b) *Cold Day*

It should be considered when minimum temperature is 10 °C or less for plains and 0 °C or less for Hilly regions

*Cold wave* : Maximum temperature Departure is –4.5 °C to –6.4 °C

*Severe Cold Wave* : Maximum temperature Departure is < –6.4 °C

*Markedly below normal* : departure of minimum temperature from normal is from –5 °C or less

*Appreciably below normal* : departure of minimum temperature from normal is from –3.1 °C to –5 °C

*Below normal* : departure from normal is –1.6 °C to –3.0 °C

*Normal* : departure from normal is –1.5 °C to +1.5 °C

*Above Normal* : departure of minimum temperature from normal is +1.6 °C to 3.0 °C

*Appreciably above normal* : departure of the minimum temperature from normal is from +3.1 °C to +5.0 °C

*Markedly above normal* : departure of the minimum temperature from normal is +5 °C or more

(C) *Fog*

*Dense Fog* : When the visibility is between 50-200 m

*Very Dense Fog* : When the visibility is < 50 m