

Weather in India

POST MONSOON SEASON (October-December 2007)†

1. Introduction

The activity of the main weather systems, accountable for a major part of the rainfall during the season, viz., the Cyclonic Storms and western disturbances, remained subdued during the post monsoon season of 2007. Like last year, only one cyclonic storm (Very Severe Cyclonic Storm ‘Sidr’) and a Depression formed over the Bay of Bengal and one Deep Depression formed over the Arabian Sea.

The Very Severe Cyclonic Storm (Sidr) had adverse impact on the northeast monsoon rainfall. It depleted moisture from the northeast monsoon regime, thus depriving Tamil Nadu¹, of its major share of rainfall, expected in the rainiest month (November) of the season. During the period of this storm, the south peninsula experienced dry weather and also reeled under cold wave. When the storm was close to Bangladesh coast, the swell waves generated by it reached even upto Tamil Nadu coast, affecting fishing operations. Also, the systems which had their origin over the west Pacific [for example, Typhoon ‘Hagibis’ (18–28 November), Typhoon Mitag (20–27 November)] did not follow a westerly course. As a result, the month of November witnessed subdued activity of northeast monsoon.

The southwest monsoon withdrew from the entire country on 22 October and simultaneously, the northeast monsoon rains commenced over the south peninsula. The spatial and temporal distribution of northeast monsoon rainfall had been quite erratic. Most of the sub-divisions in the northeast monsoon regime received *excess** rainfall during October and *deficient* rainfall in November. During December, Tamil Nadu received a large *excess* rainfall. Thus the season ended with a marginal *excess* rainfall over Tamil Nadu and *normal* rainfall over Rayalaseema, coastal and south interior Karnataka and Kerala.

Cold wave conditions started manifesting over the interior peninsular India, towards the end of November. Cold wave conditions prevailed over parts of central and north India during the later half of December. While

* Terms in *italics* other than the sub-titles are explained in Appendix.

¹ The sub-division Tamil Nadu & Puducherry is shortened as Tamil Nadu; Gujarat region, Daman, Diu & Nagar Haveli as Gujarat region through out the article

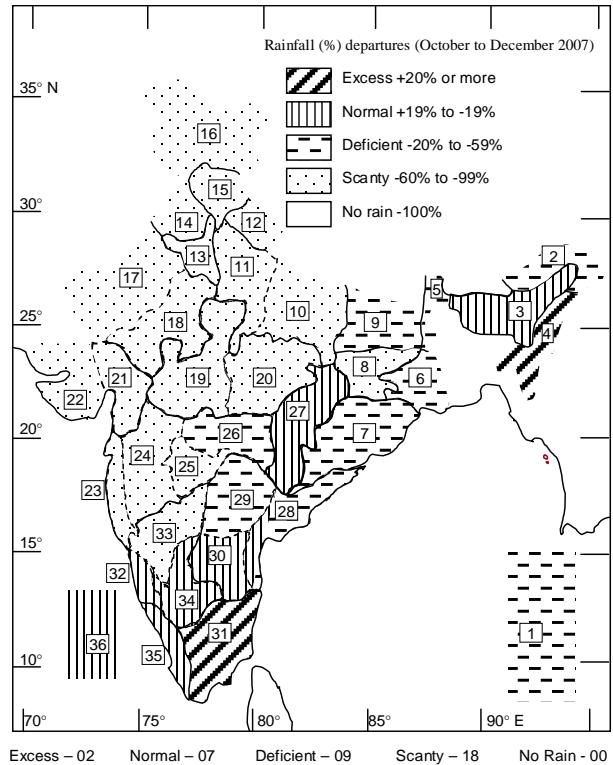


Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for Post monsoon season (October to December 2007). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1 -26	7 -43	13 -91	19 -97	25 -95	31 20
2 -39	8 -66	14 -76	20 -78	26 -54	32 -16
3 -07	9 -49	15 -77	21 -96	27 01	33 -62
4 44	10 -84	16 -68	22 -96	28 -20	34 03
5 -53	11 -92	17 -89	23 -61	29 -36	35 -05
6 -39	12 -77	18 -97	24 -90	30 00	36 19

severe cold took a toll of several lives over the northern parts of the country, it was heavy rains and flash floods that created havoc to human lives in the southern parts and northeast India.

2. Seasonal rainfall (October-December)

The meteorological sub-divisionwise rainfall departures from normal are given in Fig. 1 and Table 1.

The *deficient/scanty* rainfall over regions outside the northeast monsoon regime could be due to the following synoptic features.

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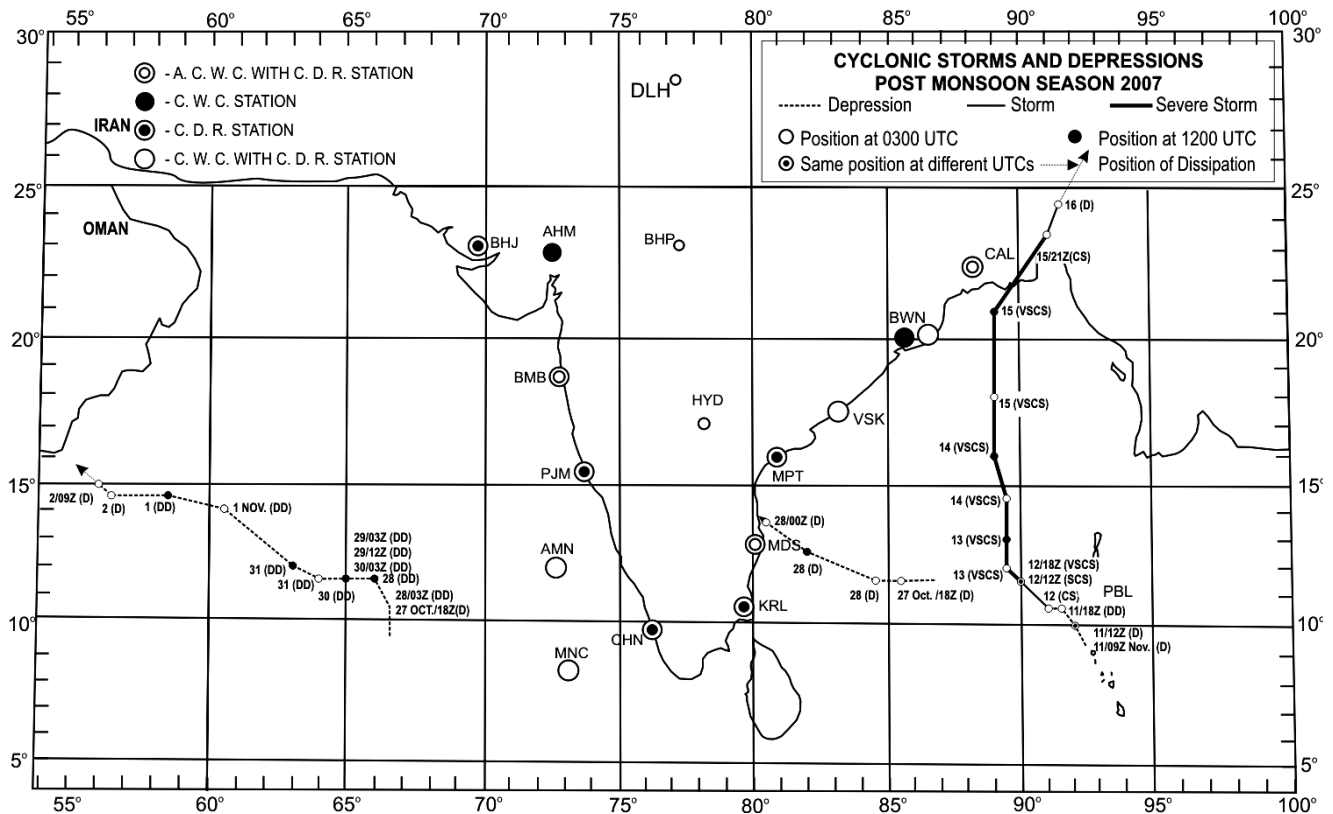


Fig. 2. Tracks of cyclonic storms and depressions during the period October to December 2007

The Western Disturbances which affected the northwest India were shallow and dry systems during the first two months of the season. Also, there was no westerly – easterly wave interaction, as the westerly troughs were confined to latitudes to the north of 30° N except in December.

3. Monthly features

3.1. October

3.1.1. Withdrawal of southwest monsoon

Though there was an unusual delay in the starting date of withdrawal from west Rajasthan, which occurred on 30 September, the subsequent withdrawal was rapid from the regions outside northeast India. It withdrew from the entire country, Bay of Bengal and Arabian Sea on 22 October with a delay of 5 days from the normal date.

3.1.2. Commencement of northeast monsoon rains

Simultaneous with the withdrawal of southwest monsoon, northeast monsoon rains commenced over Tamil Nadu, Kerala and adjoining areas of Karnataka and Andhra Pradesh on 22 October.

3.1.3. Storms and depressions

One Deep Depression and a Depression formed over the Arabian Sea and Bay of Bengal respectively, during the month. The tracks of the systems are given in Fig. 2 and details are given below:

3.1.3.1. Deep Depression over southeast Arabian Sea (27 October – 2 November 2007)

Under the influence of the cyclonic circulation over Lakshadweep area and neighbourhood, a low pressure area formed over there on 25. It lay over Lakshadweep

TABLE 1
Sub-divisionwise rainfall (mm) for each month and season as a whole (October-December 2007)

S. No.	Meteorological sub-divisions	October			November			December			Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A. & N. Islands	240	305	-21	225	236	-5	54	159	-66	519	700	-26
2.	Arunachal Pradesh	121	166	-27	20	42	-53	7	35	-80	148	244	-39
3.	Assam & Meghalaya	140	154	-9	32	25	27	6	11	-48	178	191	-7
4.	Naga., Mani., Mizo. and Tri.	201	145	38	74	40	83	7	10	-28	282	195	44
5.	Sub-Himalayan West Bengal & Sikkim	77	155	-51	7	18	-58	2	10	-82	86	183	-53
6.	Gangetic West Bengal	56	130	-57	41	23	80	0	6	-100	97	159	-39
7.	Orissa	71	121	-41	16	28	-42	0	5	-100	88	155	-43
8.	Jharkhand	30	86	-65	4	10	-60	0	5	-100	34	100	-66
9.	Bihar	39	69	-43	**	5	-96	**	4	-95	40	79	-49
10.	East Uttar Pradesh	8	52	-85	0	4	-100	2	6	-72	10	62	-84
11.	West Uttar Pradesh	4	40	-91	0	4	-100	1	7	-92	4	51	-92
12.	Uttaranchal	11	56	-81	0	9	-100	9	22	-61	19	87	-77
13.	Haryana, Chandigarh & Delhi	**	16	-99	**	5	-93	2	7	-69	2	27	-91
14.	Punjab	**	21	-99	3	5	-49	7	15	-51	10	41	-76
15.	Himachal Pradesh	9	46	-80	**	20	-98	16	46	-64	26	111	-77
16.	Jammu & Kashmir	1	36	-99	1	32	-97	48	84	-43	49	153	-68
17.	West Rajasthan	0	4	-100	0	3	-100	1	2	-49	1	9	-89
18.	East Rajasthan	0	15	-100	0	7	-100	1	4	-80	1	26	-97
19.	West Madhya Pradesh	0	32	-100	1	13	-92	**	7	-94	1	52	-97
20.	East Madhya Pradesh	4	39	-89	6	12	-46	3	9	-70	13	59	-78
21.	Gujarat region	0	22	-100	1	11	-89	0	2	-100	1	35	-96
22.	Saurashtra & Kutch	**	14	-99	1	11	-91	0	1	-100	1	26	-96
23.	Konkan & Goa	30	105	-71	23	26	-11	**	4	-99	53	135	-61
24.	Madhya Maharashtra	4	71	-94	7	28	-76	0	6	-100	11	105	-90
25.	Marathawada	0	67	-100	5	22	-76	0	7	-100	5	96	-95
26.	Vidarbha	27	53	-49	7	15	-50	0	7	-100	34	75	-54
27.	Chattisgarh	77	67	14	6	10	-39	0	5	-100	83	82	1
28.	Coastal Andhra Pradesh	220	197	12	27	104	-74	14	26	-46	261	326	-20
29.	Telangana	54	84	-36	15	21	-26	**	5	-99	70	110	-36
30.	Rayalaseema	139	121	14	27	66	-59	46	24	90	212	212	0
31.	Tamil Nadu	222	181	22	82	165	-51	216	85	154	520	432	20
32.	Coastal Karnataka	172	179	-4	43	66	-34	1	14	-96	216	258	-16
33.	North interior Karnataka	40	103	-61	12	28	-57	**	6	-97	52	137	-62
34.	South interior Karnataka	167	139	21	23	48	-52	15	13	17	206	200	3
35.	Kerala	366	292	26	94	164	-43	13	43	-69	473	499	-5
36.	Lakshadweep	214	153	40	52	117	-55	126	59	114	392	329	19

** Rainfall amount from 0.1 to 0.4 mm

TABLE 2
Details of the weather systems during October 2007

S. No. (1)	System (2)	Duration (3)	Place of first location (4)	Direction of movement (5)	Place of final location (6)	Remarks (7)
(A) Depressions / Cyclonic storms						
1.	Deep Depression	27 Oct – 2 Nov	Southeast Arabian Sea	Northwest	West central and adjoining southwest Arabian Sea	It formed in the equatorial Easterly wave. Moving westwards, it weakened over the ocean. Details are given in the text
2.	Depression	27 – 28	Southeast Bay	Do	West central and adjoining southwest Bay off north Tamil Nadu–south Andhra coasts	A low pressure area formed over the southeast Bay on 27 morning and concentrated into a depression in the night. Further details of the system are given in the text
(B) Low pressure areas						
1.	Feeble low pressure area	1 – 6	North Andhra-south Orissa coasts	Stationary	<i>In situ</i>	Less marked on 2. It was seen as an upper air cyclonic circulation from 2 to 4 and again seen as a low pressure area over the west central Bay off Andhra coast on 5 to 7. Associated cyclonic circulation extended upto 3.1 kms a.s.l. which became less marked on 8
2.	Well marked low pressure area	7 – 10	Northeast Bay and neighbourhood	Northwest	Bangladesh	Less marked on 10. Associated cyclonic circulation extended upto mid tropospheric levels which became less marked on 11
3.	Low pressure area	15	North Bay off West Bengal-Bangladesh coasts	Stationary	<i>In situ</i>	Less marked on 16. Associated cyclonic circulation extended upto mid tropospheric levels. The cyclonic circulation lay over Assam & Meghalaya on 17 and became less marked on 18
4.	Do	24	Southwest Bay off Tamil Nadu coast and adjoining Sri Lanka	Do	Do	It was first observed as a cyclonic circulation over the southwest and adjoining west central Bay off Tamil Nadu-Andhra coasts. The low pressure area became less marked on 25. However, the associated cyclonic circulation lay over south Tamil Nadu-Kerala and adjoining Sri Lanka on 25 and merged with the cyclonic circulation associated with system I.1
(C) Western Disturbances/Eastward moving systems						
(i) Upper air cyclonic circulations						
1.	Mid tropospheric levels	1 – 4	North Pakistan and neighbourhood	Northeast	Jammu & Kashmir	Moved away on 5
2.	Do	5 – 7	North Pakistan and adjoining Jammu & Kashmir	Do	Do	Moved away on 8
3.	Do	8 – 15	North Pakistan and neighbourhood	Do	Do	Moved away on 16
4.	Do	17 – 23	North Pakistan and adjoining Jammu & Kashmir	Do	Do	Moved away on 24
5.	Do	24 – 27	Do	Do	Do	Moved away on 28
6.	Do	31 Oct – 2 Nov	Jammu & Kashmir and adjoining north Pakistan	Do	Do	Moved away on 3 November

TABLE 2(Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>(ii) Induced cyclonic circulation</i>						
1.	Lower tropospheric levels	3 – 6	West Rajasthan and neighbourhood	Northeast	East Uttar Pradesh and neighbourhood	Less marked on 7
<i>(iii) Trough in westerlies</i>						
1.	Mid & Upper tropospheric westerlies (7.6 kms a.s.l.)	3 – 12	Long. 70° E, to the north of Lat. 25° N	Eastnortheast	Long. 72° E, to the north of Lat. 25° N	Moved away on 13
2.	Do	14 – 17	Long. 72° E, to the north of Lat. 25° N	Northeast	Long. 83° E, to the north of Lat. 28 N	Moved away on 18
3.	Do	18 – 19	Long. 77° E, to the north of Lat. 25° N	East	Long. 82° E, to the north of Lat. 25° N	Moved away on 20
4.	Do	26 – 29	Long. 68° E, to the north of Lat. 30° N	Northeast	Long. 70° E, to the north of Lat. 25° N	Moved away on 30
<i>(D) Other upper air cyclonic circulations</i>						
1	Mid tropospheric levels	3 – 10	East central Arabian Sea off Goa-Karnataka coasts	Quasi-stationary	Southeast Arabian Sea off Karnataka-Kerala coasts	Merged with system III.3 on 11
2.	Do	10 – 11	Southwest Bay off Tamil Nadu coast	West	Tamil Nadu and adjoining Sri Lanka coast	Less marked on 12
3.	Do	11 – 19	Commorin area and neighbourhood	Northwest	East central and adjoining southeast Arabian Sea off Karnataka-Kerala coasts	Less marked on 20
4.	Do	11 – 12	East central Arabian Sea off south Maharashtra-Goa coasts	Stationary	<i>In situ</i>	Less marked on 13
5.	Do	13 – 14	North Andaman Sea and neighbourhood	Do	Do	Less marked on 15
6.	Do	13 – 17	West central and adjoining southwest Bay off south Andhra-north Tamil Nadu coasts	Southwest	Tamil Nadu and adjoining Commorin area	Less marked on 18
7.	Do	16 – 17	Bihar and adjoining east Uttar Pradesh	West	East Uttar Pradesh and neighbourhood	Less marked on 18
8.	Do	17 – 18	Gangetic West Bengal and neighbourhood	Do	Gangetic West Bengal and adjoining Jharkhand	Less marked on 19
9	Do	19 – 31 (cont.)	South Andaman Sea	Stationary	<i>In situ</i>	It persisted throughout the month. Under its influence, a severe cyclonic storm (Sidr) formed over the area in the month of November. Further details are given in Table 3
10.	Do	26 – 27	Southwest Bay off south Tamil Nadu coast and adjoining Sri Lanka	Do	Do	Less marked on 28
11	Do	29 Oct – 2 Nov	Coastal Karnataka and adjoining Lakshadweep	Northnortheast	Madhya Maharashtra and neighbourhood	Less marked on 3 November

TABLE 3

Details of the weather systems during November 2007

S. No. (1)	System (2)	Duration (3)	Place of first location (4)	Direction of movement (5)	Place of final location (6)	Remarks (7)
(A) Cyclonic storm						
1.	Very severe cyclonic storm (Sidr)	11 – 16	Southeast Bay and adjoining Andaman Sea	Northwest, north and then northeast	Bangladesh and adjoining Tripura	After crossing West Bengal coast, it recurved towards the northeastern states. Details are given in the text
(B) Western Disturbances /Eastward moving systems						
<i>(i) Upper air cyclonic circulations</i>						
1.	Mid tropospheric levels	7 – 9	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir	Moved away on 10
2.	Do	9 – 12	Do	Do	Do	Moved away on 13
3.	Do	14 – 18	Do	Do	Do	Moved away on 19
4.	Do	20 – 21	Do	Do	Do	Moved away on 22
5.	Do	22 – 26	Do	Do	Do	Moved away on 27
6.	Do	27 Nov – 2 Dec	Do	Do	Do	Moved away on 3 December
<i>(ii) Induced systems</i>						
1.	Lower levels	7 – 11	Rajasthan and neighbourhood	Northeast	West Madhya Pradesh and neighbourhood	Less marked on 12
<i>(iii) Troughs in westerly</i>						
1.	Mid and upper troposphere	7 – 15	Long. 85° E, to the north of Lat. 25° N	East	Long. 87° E, to the north of Lat. 22° N	Moved away on 16
2.	Do	29 Nov – 3 Dec	Long. 62° E, to the north of Lat. 20° N	East	Long. 78° E, to the north of Lat. 25° N	Moved away on 4 December
(C) Other upper air cyclonic circulations						
1.	Mid tropospheric levels	1 – 10	Andaman Sea and neighbourhood	West	Southeast	Persisted since 19 of Oct. Under its influence, severe cyclonic storm (Sidr) formed
2.	Do	1 – 5	Southwest Bay off south Tamil Nadu coast	West	South Sri Lanka and adjoining Commorin area	Less marked on 6
3.	Do	2 – 5	Assam & Meghalaya and neighbourhood	Do	Do	Less marked on 6
4.	Do	3 - 7	Southeast and adjoining east central Arabian Sea off Karnataka-Kerala coasts and adjoining Lakshadweep area	Quasi-stationary	Southeast Arabian Sea and adjoining Lakshadweep area	Less marked on 8
5.	Do	6 – 12	Southwest Bay off south Tamil Nadu coast and adjoining Sri Lanka coast	Stationary	<i>In situ</i>	Less marked on 13
6.	Do	15 – 18	Lakshadweep and neighbourhood	Do	Do	Less marked on 19
7.	Do	16 – 18	Southwest Bay off south Tamil Nadu and adjoining Sri Lanka	Do	Do	Less marked on 19

TABLE 3(Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
8.	Mid tropospheric levels	18 – 28	Commorin area and neighbourhood	West	Maldives and adjoining Commorin area	Less marked on 29
9.	Do	20 – 28	Southwest Bay off Sri Lanka coast	Northwest	Maldives and adjoining Lakshadweep areas	Less marked on 29
10.	Do	26 – 28	Central Arabian Sea off Goa-Karnataka coast	Stationary	<i>In situ</i>	Less marked on 29
11.	Do	28 Nov - 3 Dec	Tamil Nadu and adjoining Kerala	South	Southwest Bay off Sri Lanka coast	Less marked on 4 December
12.	Do	22 – 24	Bangladesh and neighbourhood	Southeast	Bangladesh and adjoining Myanmar	Less marked on 25
13.	Do	27 – 29	Nagaland-Manipur-Mizoram-Tripura and neighbourhood	Stationary	<i>In situ</i>	Less marked on 30
(D) Other troughs						
1.	Mid tropospheric levels	10 – 11	Sikkim to Gangetic West Bengal	Stationary	<i>In situ</i>	Less marked on 12
2.	Trough in easterly (lower tropospheric levels)	30 Nov – 7 Dec	Lakshadweep area to south Maharashtra	Quasi-stationary	Lakshadweep area	It was seen with an embedded cyclonic circulation over Madhya Maharashtra on 1 December and over Lakshadweep area and neighbourhood on 2 December

area and adjoining southeast Arabian Sea on 26 and became well-marked in the same evening. Subsequently, it concentrated into a Depression at 1800 UTC of 27 and lay centered near Lat. 10.5° N / Long. 66.5° E. It remained practically stationary and further intensified into a Deep Depression, which lay centered at 0300 UTC of 28 near Lat. 10.5° N / Long. 66.5° E. Moving slightly northwestwards, it lay centered near Lat. 11.5° N / Long. 66.0° E at 1200 UTC. At 0300 UTC of 29, it lay near Lat. 11.5° N / Long. 65.5° E. It remained practically stationary there upto 0300 UTC of 30. Then, it moved westwards and lay centered near Lat. 11.5° N / Long. 65.0° E at 1200 UTC of 30 and near Lat. 11.5° N / Long. 64.0° E at 0300 UTC of 31. It moved westnorthwestwards and lay centred at 0300 UTC of 1 November near Lat. 14.0° N / Long. 60.5° E and at 1200 UTC near Lat. 14.5° N / Long. 58.5° E. Subsequently, it weakened into a depression and lay centred at 0300 UTC of 2 near Lat. 14.5° N / Long. 56.5° E and at 0900 UTC near Lat. 15.0° N / Long. 56.0° E. It further weakened into a well marked low pressure area in the evening over the west central and adjoining southwest Arabian sea. It weakened into a low pressure area over there and became less marked on 3 morning.

The system was tracked by satellite. The highest T number of 2.0 was given by satellite imageries from 0300 UTC of 28 October to 0000 UTC of 2 November. The

maximum estimated wind speed was 30 kts. The lowest Estimated Central Pressure (ECP) was 1000 hPa.

As the system was far away from the Indian coast, it did not affect the weather in India.

3.1.3.2. Depression over the east central Bay (27–28 October 2007)

A low pressure area formed over the southeast Bay of Bengal on 27. It concentrated into a Depression at 1800 UTC of 27 and lay centered near Lat 11.5° N / Long. 85.5° E. Moving westwards, it lay centered at 0300 UTC of 28 near Lat 11.5° N / Long. 84.5° E (about 480 kms southeast of Chennai) and near Lat. 12.5° N / Long. 82.0° E at 1200 UTC. It weakened into a well marked low pressure area and lay over the west central and adjoining southwest Bay off north Tamil Nadu–south Andhra coasts on 29.

The maximum intensity of T 1.5 was reported by satellite imagery from 1800 UTC of 27 to 0000 UTC of 29.

The system did not cross the coast. The maximum estimated wind speed was 25 kts. The lowest estimated central pressure was 1004 hPa.

TABLE 4

Details of the weather systems during December 2007

S. No. (1)	System (2)	Duration (3)	Place of first location (4)	Direction of movement (5)	Place of final location (6)	Remarks (7)
(A) Low pressure area						
1.	Well marked low pressure area	11 – 15	Southwest Bay off south coast of Sri Lanka	West	Sri Lanka and adjoining Commorin area	Less marked on 16. It was first observed as a cyclonic circulation extending upto mid tropospheric levels over the southwest Bay off Sri Lanka coast
(B) Western Disturbances /Eastward moving cyclonic circulations						
<i>(i) Upper air cyclonic circulations</i>						
1.	Mid tropospheric levels	2 – 4	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 5
2.	Do	5 – 8	Do	Do	Jammu & Kashmir	Moved away on 9
3.	Do	9 – 13	Do	Do	Jammu & Kashmir and neighbourhood	Moved away on 14
4.	Do	14 – 18	Do	Do	Jammu & Kashmir	Moved away on 19
5.	Do	18 – 22	North Pakistan and neighbourhood	Do	Do	Moved away on 23
6.	Do	23 – 28	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Moved away on 29
7.	Do	29 – 30	Do	Do	Do	Moved away on 31
8.	Do	31 Dec – 2 Jan 08	Do	Do	Do	Moved away on 3 January 08
<i>(ii) Induced cyclonic circulations</i>						
1.	Lower tropospheric levels	9 – 13	Central Pakistan and adjoining Punjab and neighbourhood	East	West Madhya Pradesh and adjoining east Rajasthan	Less marked on 14
2.	Mid tropospheric levels	11 – 13	West Rajasthan and neighbourhood	Do	Do	Less marked on 14
3.	Do	13 – 21	Central Pakistan and adjoining Punjab	Eastnortheast	Punjab and neighbourhood	Less marked on 22
4.	Do	19 – 20	West Rajasthan and neighbourhood	Stationary	<i>In situ</i>	Less marked on 21
5.	Do	23 – 24	South Pakistan and adjoining West Rajasthan	Do	Do	Less marked on 25
6.	Do	31 Dec 07 - 7 Jan 08	Punjab and neighbourhood	Do	Do	Less marked on 8 January 08
<i>(iii) Troughs in westerlies</i>						
1.	Mid and upper troposphere	6 – 8	Long. 65° E, to the north of Lat. 25° N	Northeast	Long. 85° E, to the north of Lat. 25° N	Moved away on 9

TABLE 4(Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.	Mid and upper troposphere	13 - 17	Long. 68° E, to the north of Lat. 20° N	Northeast	Long. 82° E, to the north of Lat. 15° N	Moved away on 18
3.	Do	28 - 30	Long. 64° E, to the north of Lat. 20° N	Do	Long. 70° E, to the north of Lat. 20° N	Moved away on 30
4.	Do	31 Dec 07 - 8 Jan 08	Long. 65° E, to the north of Lat. 15° N	Stationary	<i>In situ</i>	Less marked on 9 January 08
(C) Other cyclonic circulations						
1.	Mid tropospheric levels	4 - 5	South Tamil Nadu and neighbourhood	Stationary	<i>In situ</i>	Less marked on 6
2.	Do	21 - 26	Assam & Meghalaya and neighbourhood	West	Bangladesh and neighbourhood	Less marked on 27
3.	Do	26 Dec 07 - 1 Jan 08	Maldives area	North	Lakshadweep and neighbourhood	Less marked on 2 January 08
4.	Do	27 Dec 07 - 6 Jan 08	Sri Lanka and adjoining southwest Bay	Northnorthwest	Lakshadweep and adjoining Maldives	Less marked on 7 January 08
(D) Troughs in easterlies						
1.	Lower tropospheric levels	6 - 7	Lakshadweep area to Gujarat coast	Stationary	<i>In situ</i>	Less marked on 8
2.	Trough of low (Sea level)	15 - 27	Southeast Bay and adjoining south Andaman Sea	West	Maldives area	Less marked on 28
3.	Do	16 - 24	Commorin area to east central Arabian Sea	Do	Maldives area to south Maharashtra coast	It was seen with an embedded cyclonic circulation extending upto mid tropospheric levels over Maldives on 19, over Lakshadweep area on 20, southeast and adjoining east central Arabian Sea on 21 and over the westcentral Arabian Sea on 22. It reorganized into a low pressure area on 23 and became less marked on 24
4.	Do	22 - 26	Southwest Bay off Sri Lanka coast	Quasi-stationary	Commorin area and adjoining southwest Bay	Less marked on 27
5.	Do	23 - 29	Andaman Sea	West	Andaman Sea and adjoining southeast Bay	Less marked on 30

Extremely heavy rainfall occurred in Rayalaseema on 29 and in coastal Andhra Pradesh on 29 & 30. Heavy to very heavy rainfall occurred in Tamil Nadu from 27 to 29. The northeast Monsoon was vigorous on 29 & 30 in Rayalaseema and on 31 in coastal Andhra Pradesh

28 Oct 2007

Sulurpet 10.

29 Oct 2007

Naidupetta 31, Kota 28, Pellakur, Vakadu 26.

30 Oct 2007

Kavali 35, Bogole 34, Jaladanki 26, Dagadarthi, Sangam 25.

The chief amounts of rainfall in cms are:

Coastal Andhra Pradesh

27 Oct 2007 Venkatagiri Town 10.

Rayalaseema

29 Oct 2007 Srikalahasti 27, Tirupathi 18.

TABLE 5

Representative rainfall amounts (October – December 2007)

Date (1)	October (2)	November (3)	December (4)
1.	Gingee 19, Sikandarpur 12, Shillong 9, Mana, Jharsuguda, Polur & Barkisurya 8 each, Laxhipur & Malkangiri 7 each, Munger, Muzaffarpur, Dantewada & Dharmavaram 6 each, Palari, Belthangadi, Jagalur, Cannur & Chengalpattu 5 each, Junagarh, Karanjia, Jamshedpur, Kamtaul, Sonbarsa, Janjgir, Rentachintala, Kalghatgi, Ankola, Haveri, Aryankavu, Lengpui, Thalassery, Vadkara, Bhadravati & Tambaram 4 each, Silchar, Agartala, Hut Bay, Cooch Behar, Purihansa, Jamankira, Deogarh, Sohela, Hayaghat, Sanguem, Podili, Venkatapuram, Mangalore, Kumta, Shiggaon, Joshipur, Dunguripalli, Bhawanipatna, Villupuram & Peermade 3 each, Long Islands, Nancowry, Pedong, Hasimara, Ambabhona, Bargarh, Deogaon, Panposh, Ahirwalia, Lalbegiaghat, Rosera, Samastipur, Saja, Rajnandgaon, Athagarh, Bhanupratappur, Kandukur, Metapalli, Srisailam, Cuddalore, Puttur, Udupi, Karwar, Savanur, Madder, Madagi, Ambur, Tindivanam, Bharamasagara, Challakere, Alapuzha, Aluva, Konni, Mannarkad, Paravur, Thrissur, Banpur, Pottangi, Sundergarh, Mahendragarh, Koraput & Hindigir 2 each, Imphal, Port Blair, Rengali, Sukiapokhri, Asansol, Champua, Telkoi, Sambalpur, Akhuapada, Pallahara, Rengali, Laikera, Baragaon, Mohana, Jeypore, Colgaon, Saulighat, Lalganj, Canacona, Mapusa, Raipur, Dhamtari, Bilaspur, Korba, Bapatla, Tiruvuru, Yerragondapalem, Armoor, Madnoor, Jagitiyal, Kamalapuram, Dharmapuri, Puducherry, Mangalore, Mani, Shirali, Mundagod, Bantwal, Khanapur, Hangal, Byadgi, Ajjampura, Kanakapura, Cherthala, Karipur, Kasargod, Kottayam, Mancompu, Manjeri, Perumbavur, Punalur, Srirangapatna, Ramanagara, Channapatna, Honnali, Shikaripur, Umerkote, Chandanpur, Jamsolaghat, Kakatpur, Tilaiya, Pali, Konta, Sirchilla, Kunnnavaram & Haliyal 1 each	Kawakurthy 11, Piduguralla & Vinjamur 9 each, Cuddalore 8, Srisailam, Keonjharagarh, Belgaum & Kolkata 7 each, Panruti 6, Krishnaprasad, Kaveli, Cochi, Nellore, Harur & Gingee 5 each, Siddapura, Nagapattinam, Kolkata, Tiruvannamalai, Villupuram & Ulundurpet 4 each, Puducherry, Karaikal, Nizamabad & Tirukoilur 3 each, Vijaywada, Machilipatnam, Nancowry, Parbhani, Hyderabad, Tindivanam, Pappireddipatti, Kurmool & Gulbarga 2 each, Canning Town, Jharsuguda, Balasore, Jamshedpur, Aurangabad, Pune, Solapur, Port Blair, Bapatla, Tuni, Dharmapuri, Sambra, Srimushnam, Virudhachalam, Parangipettai, Dharmapuri & Pochampalli 1 each	Deomali, Khonsa, Nagapattinam & Tiruvarur 2 each, Kukernag, Srinagar, Passighat, Gulmarg, Quazigund, Mancompu, Minicoy, Dapoli & Sundernagar 1 each
2.	Honavar 11, Avanihatta 8, Repalla & Shikaripur 7 each, Car Nicobar, Kohima & Ginjee 6 each, Port Blair, Kakatpur & Navipet 5 each, Manas, N. H. Xing, Lumding, Malkangiri, Salur, Ramannapet & Cannur 4 each, Dibrugarh, Naharkatia, Hut Bay, Maya Bandar, Bhalukpong, Neora, Khairamal, Rajkanika, Paikmal, Amalapuram, Patapatnam, Narsampet, Perur & Puducherry 3 each, Shillong, Beki Road Bridge, Barpeta, Nalbari, Khowang, Bihubar, Goalpara, Cooch Behar, Berhampur, Chhatrapur, Bhawanipatna, Raigarh, Machilipatnam, Parvathipuram, Prakasam Barrage, Armoor, Khammam, Mahabubabad, Sriramsagar, Allagadda, Alur, Pamidi, Alapuzha, Kottayam, Chengalpattu & Tindivanam 2 each, Puthimari, Motunga, Seppa, Champasari, Chepan, Diana, Gajoldoba, Murti, Nilgiri, Keonjharagarh, Udayagiri, Manali, Dabolim, Akaltara, Eturunagar, Hakimpet, Jangaon, Agumbe, Medikeri, Cochi, Thiruvananthapuram, Titlagarh, Darsi, Kaleshawaram, Kamareddy, Nizamabad, Shenkottai, Polur & Tirupattur 1 each	Sholavandan 9, Raigarh, Rajanpur, Balimundali, Thakurmunda, Nagpur, Gundlupet, Chengam, Aravakurichi & Malanjkhand 7 each, Ghatgaon, Baripada, Mulanur & Palacode 6 each, Gobichettipalayam, Tiruppuvanam & Vedaranniyam 5 each, Champua, Tiruppur, Tenkasi, Yercaud & Chittampatti 4 each, Chandbali, Jharsuguda, Nagpur, Bhavani, Dharapuram, Kulithalai, Naduvattam, Krishnagiri, Needamangalam, Madurai City, Manaparai & Tiruchengode 3 each, Jamshedpur, Betul, Pamban, Salem, Avinashi, Erode & Nagapattinam 2 each, Digha, Bankura, Kolkata, Harnai, Raipur, Kaveli, Nellore, Coimbatore, Gingee, Chatrapatti, Natham, Madurai, Kozhikode & Tirupathi 1 each	Vedaranyam 4, Arantangi, Ramanathapuram, Adiramattinam, Nanilam, Pamban & Minicoy 1 each
3.	Dehri, Indrapuri, Patnagarh & Vijayawada 8 each, Maya Bandar, Kumta & Port Blair 7 each, Swampatna 6, Sonamura, Simulia, Karanjia & Gaya 5 each, Dharmannagar, Sambalpur, Jashpurnagar, Kunkuri & Dowlaiswaram 4 each, Paravur, Long Islands, Gharmura, Annapurna Ghat, Pallahara, Paikmal, Pottangi, Kotraguda, Gariaband, Bansa, Ambikapur, Kharaghoda, Bhimadole & Eluru 3 each,	Amini Divi 7, Ottapidaram, Bhograi & Keonjharagarh 6 each, Kuzhithurai, Eraniel, Kothagiri, Palayamkottai, Ghatgaon & Neyyattinkara 5 each, Nagercoil, Mettupalayam, Tiruttani, Tiruvallur, Rasipuram, Tiruppuvanam, Kundha Bridge, Uthamapalayam,	Triuchendur 4, Rohtak 2, Jhansi, Nowgong, Tuticorin, Ajmer, Cuddalore, Parangipettai, Chengalpattu, Tambaram, Ramanathapuram, Red Hills, Arakonam & Chennai 1 each

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
	Sorada, Nawapura, Kosagumda, Tikabali, Hut Bay, Karimganj, Lengpui, Baghdogra, Murti, Berhampur, Athamalik, Hemgiri, Panposh, Bhubaneswar, Ranpur, Titlagarh, Pandaria, Saraipali, Taniku & Perur 2 each, Maya Bandar, Agartala, Kailashahar, Diana, Gajoldoba, Jalpaiguri, Balurghat, Altuma, Talcher, Padampur, Jharsuguda, Baragaon, Palari, Bijapur, Narayanpur, Amalapuram, Narsapur, Polavaram, Tadepalligudem, Tuni, Dummagudem, Eturunagaram, Venkatapuram, Mangalore, Honavar, Chitradurga, Lahunipara, Bhawanipatna, Jeypore, Malkangriri, Puri, Dashapalla, Belgaon, Baliguda, Kattagarh, Bissam, Cuttack & Gudari 1 each	Tikabali, Lumding & Gowribidanur 4 each, Metpattim, Tiruchendur, Sathankulam, Ariyalur, Sankarankoil, Manapara, Kanchipuram, Ketti, Ginge, Periyakulam, Mulanur, Shlovandan, Watrap & Quilandy 3 each, Sivakasi, Sivaganga, Ambasundaram, Shankottah, Madurai, Digha & Cochi 2 each, Adirampattinam, Bangalore, Kozhikode, Jharsuguda, Kaveli, Kovilapatti, Alamgudi, Red Hills, Uthagamandalam, Hosur, Yercaud, Nilakottai, Nancowry & Imphal 1 each	
4.	Athagarh 9, Ambabhona 7, Konta, Jashpurnagar, Tilaiya, Amraghat, Dabolim & Ambikapur 4 each, Colgaon, Matizuri & Cuttack 3 each, Maya Bandar, Puri, Jagdalpur, Raigarh, Narsapur, Karwar & Alapuzha 2 each, Medikeri, Silchar, Paradip, Keonjharagarh, Chandbali, Ratnagiri, Shirali & Sambalpur 1 each	Ambur 14, Tirupattur & Bantwal 7 each, Tiruchendur, Srivaikuntam & Kozha 6 each, Alapuzha, Cherthala, Panambur, Mudukulathur, Kothagiri, Shankottah, Tiruppuvanam, Manamadurai & Cuddalore 5 each, Piravom, Uthagamandalam, Kovilapatti, Ketti, Nilakottai, Aranthangi, Dindigul, Sholavandan, Vadaranniyam, Melur & Amini Divi 4 each, Natham, Perundurai, Krishnagiri, Usilampatti, Pondicherry, Sirkali, Thirumayam, Sattur, Sivakasi Sringeri & Cochi 3 each, Palayamkottai, Chidambaram, Nagapattinam, Karaikal, Vellore & Tuticorin 2 each, Kaveli, Nellore, Kodaikanal, Palayamkottai, Pamban, Tondi, Madurai, Polur & Palani 1 each	Tezpur, Tambaram & Kampur 4 each, north Lakhimpur, Margarita, Khonsa, Kampur & Deomali 3 each, Jorhat 2, Khowang, Neematighat, Salem, Badatighat, Chouldhowaghat, Sibsagar, Chennai, Chengalpattu, Red Hills & Arakonam 1 each
5.	Visakhapatnam 26, Chodavaram 15, Vizinagaram & Dantewara 13 each, Bhimavaram & Sompeta 12 each, Polavaram 11, Konta, Anakapalli & Narsapur 10 each, Tadepalligudem, Tuni & Koida 9 each, Ranastharam & Kunavaram 8 each, Sikadia, Chipurupalli & Koyyalagudem 7 each, Bheemunipatnam, Bhimadole, Narsinpatnam, Palasa, Parthipadu, Srungavarapukota & Yellandu 6 each, Ichapuram, Kakinada, Mandasa, Paderu, Tanuku & Dummagudem 5 each, Etapalli, Pottangi, Tilaiya, Varanasi, Chintalapudi, Eluru, Dowlaiswaram, Gajapathinagaram, Peddapuram, Rajamundry, Salur & Bhadrachalam 4 each, Sironcha, Aryankavu, Bhubaneswar, Mapusa, Koderu, Patapatnam, Tekkali, Madhira & Perur 3 each, Gopalpur, Pendra, Amalapuram, Bobbili, Machilipatnam, Terlam, Eturunagaram, Kaleswaram, Khammam, Venkatapuram & Rayadurg 2 each, Car Nicobar, Puri, Malvan, Marmugoa, Dabholim, Champa, Kalingapatnam, Nandigama, Parvathipuram, Vijayawada, Palakonda, Madurai, Honavar, Alapuzha, Kozhikode, Rasipuram, Veerghattam & Gannavaram 1 each	Panruti, Kothagiri & Konni 5 each, Udupi 4, Parangipettai, Ponneri, Sankarankoil, Punalur, Nellore, Pamban, Mulki, Gundulpet, Nagapattinam & Rajkot 3 each, Redhills, Ketti, Ginge, Aryankavu, Karaikal, Chennai & Car Nicobar 2 each, Puducherry, Namakkal, Bhavani, Poondi, Cuddalore, Mangalore, Porbandar, Jagdalpur & Port Blair 1 each	Cuddalore, Katturmannarkoil & Parangipettai 1 each
6.	Dantewara 23, Koida & Kunavaram 16 each, Konta 10, Malkangiri 9, Chintapalli 8, Bhadravati 7, Chandrapur & Sorada 6 each, Krishnanagar, Rewa & Waltair 5 each, Irikkur, Varanasi & Jagdalpur 4 each, Nandigama & Tuni 3 each, Hut Bay, Car Nicobar, Gaya, Satna, Nalgonda & Chidambaram 2 each, Gopalpur, Daltonganj, Ratnagiri, Bhira, Nagpur, Kalingapatnam, Kakinada, Vijaywada, Mangalore, Kota, Shirali, Hubli, Bhagamandala, Cannur & Ketti 1 each	Ambasamudram 6, Eraniel & Alapuzha 5 each, Thucklay, Watrap & Nedumangd 4 each, Ramanathapuram, Salem, Paravur, Haluyal, Chalakudi & Vadakkancherry 3 each, Nanguneri, Sankarankoil & Bhograi 2 each, Tuticorin, Sivakasi, Digha, Sangli, Sawantwadi, Bapatla, Kanyakumari & Belgaum 1 each	Tirupathi, Tiruttani & Sholingir 2 each, Vellore, Chennai, Tiruvallur, Red Hills, Ponneri, Tambaram, Ulundurpet & Vellore 1 each
7.	Dhanora 8, Jaipatna 7, Lakhandur, Belonia & Canning Town 6 each, Kurkheda & Malvan 5 each, Nawarangpur,	Karipur 10, Kozhikode 9, Sankarankoil, Irikkur, Kanjirapally & Shirali 8 each,	Chennai 4, Srimushnam 3, Chidambaram, Parangipettai,

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
	Sawantwadi & Visakhapatnam 4 each, Lanji, Kolkata, Kudal & Kalingapatnam 3 each, Kudulu, Panambur, Golaghat, Nancowry, Devgad & Marmugoa 2 each, Diamond Harbour, Kankavli, Vaibhavwadi, Dabholim, Jagdalpur, Ramagundam, Kozhikode, Kuzhithurai & Thoivalai 1 each	Nanguneri & Kayamkulam 7 each, Thalasserry, Mulki, Karkala & Nanjangud 6 each, Thiruvananthapuram 5, Erode, Srivilliputhur, Chengam, Nippani, Cochi & Alapuzha 4 each, Watrap, Nannilam, Periyakulam & Tirumangalam 3 each, Coimbatore, Tondi & Salem 2 each, Hut Bay, Nancowry, Mahabaleshwar, Uthagamandalam, Sivakasi, Mangalore, Punalur & Cannur 1 each	Tambaram, Mayiladuthurai, Tiruttani & Poondi 2 each, Panruti, Toludur, Natham, Needamangalam, Ponneri, Gowribidanur, Mulbagal, Cuddalore, Coonoor, Puducherry, Tirupathi & Vellore 1 each
8.	Tangla 12, Sukinda 11, Mellabazar 8, Pottangi 7, Malkangiri & Cherrapunji 6 each, Agartala & Malda 5 each, Panjim, Thiruvananthapuram & Kuzhithurai 4 each, Kolkata, Chengalpattu, Kanchipuram, Nagercoil & Thoivalai 3 each, Dhubri, Canning Town, Chikodi & Minicoy 2 each, Imphal, Cooch Behar, Kanyakumari, Nippani, Bhagamandala, Huliurdurga, Milady, Thuckalay & Alipur 1 each	Banavasi 8, Malvan & Panjim 7 each, Dharwad 5, Honavar & Dabolim 4 each, Ramanathapuram, Ottapidaram, Bhagamandala, Thodupuzha, Gangtok, Haveri, Mundagod & Gangtok 3 each, Dindigul, Chitapatti, Ambasundaram, Sivakasi, Siddapura, Karkala, Haliyal, Ratnagiri, Talaguppa, Kottigehara, K. R. Sagar, Amini Divi & Hut Bay 2 each, Madurai, Nagapattinam, Sattur, Watrap, Tyagarthi, Soraba, Shiralkoppa, Ankola & Madurai 1 each	Malur, Gingee, Arakonam & Ambur 1 each
9.	Cherrapunji 25, Belonia 13, Arundhutinagar 9, Vengurla, Gaganbavda & Agartala 7 each, Kolkata 6, Basar 5, Shillong, Baltara & Kailashahar 4 each, Dhubri, Guwahati, Tezpur & Gangtok 3 each, Bhalukpong & Ratnagiri 2 each, Port Blair, Maya Bandar, Passighat, Silchar, Imphal & Canning Town 1 each	Varkala 14, Thiruvananthapuram 11, Nedumangad 8, Alapuzha, Watrap, Panjim & Malvan 7 each, Haripad 6, Sherkottah & Dharwad 5 each, Tenkasi & Honavar 4 each, Srivilliputhur, Mundagod & Haveri 3 each, Harur, Athur, Tindivanam, Talaguppa, Amini Divi, Car Nicobar & Digha 2 each, Thoovalai, Tirukoilur, Subramanya, Salem, Hut Bay, Nancowry & Tirupathi 1 each	Karaikal 5, Nagapattinam 3, Nancowry, Tondi, Vedaranyam, Muthupet & Tiruthuraipoondi 1 each
10.	Cherrapunji 14, Dhubri 9, Kherunighat 8, Tezu & Silchar 5 each, Cooch Behar 4, Guwahati 3, Bhalukpong, Tezpur & Sankarankoil 2 each, Imphal 1	Thiruvananthapuram 11, Nancowry 7, Car Nicobar, 4, Sankarankoil, Aizwal, Irikkur, Hut Bay & Port Blair 3 each, Sherkottah 2, Tawang & Aryankavu 1 each	Jayapura, Gulmarg, Nancowry, Dhundhi, Pahalgam & Kupwara 1 each
11.	CIAL Cochi 11, Dharmasthala & Nalbari 7 each, Thiruvananthapuram 6, Karkala, Khonsa, Dillighat, Punalur & Guwahati 5 each, Udipi, Itanagar, Cherrapunji, Port Blair & Kundha Bridge 3 each, Kalaghatgi, Kudal & north Lakhimpur 2 each, Car Nicobar, Passighat, Dibrugarh & Kailashahar 1 each	Car Nicobar 18, Port Blair 11, Hut Bay 8, Periyakulam, Nanguneri & Watrap 7 each, Srivilliputhur 6, Thoovalai & Sankarankoil 4 each, Nagercoil, Ambasundaram, Idukki, Perinthalmanna & Long Islands 3 each, Peermade, Mylaudi, Palayamkottai, Radhapuram, Sherkottah, Tenkasi, Ottapidaram & Karaikal 2 each, Deomali, Nancowry, Sullur, Tirumangalam, Sathankulam & Sivakasi 1 each	Hoshiarpur 2, Anandpur Sahib, Balachaur, Faridkot, Faridabad, Ludhiana, Mukerian, Nawanshahar, Berthin, Ghamroor, Kahu, Kasol, Kalpa, Shimla, Sunni Bhaji, Una & Nancowry 1 each
12.	Thrissur 9, Thodupuzha 8, Cochi 7, Ottappalam 5, Pollachi & Karkala 4 each, Kankavli, Kodaikanal & Tambaram 3 each, Ratnagiri & Nedumbassery 2 each, Kozhikode, Maya Bandar, Kuzhithurai, Palayamkottai & Periyanaikanpalayam 1 each	Long Islands 7, Car Nicobar 6, Port Blair 4, Maya Bandar 3, Thodupuzha, Hut Bay & Nancowry 2 each, Tezu, Kozha, Ongole, Eraneil, Nagercoil, Pamban, Kodavasl, Vilathikuaim & Punalur 1 each	Kukernag 4, Quazigund & Banihal 2 each, Nancowry, Kalpa, Rampur Bushar, Batote, Katra, Bhadrava & Chengalpattu 1 each
13.	Konni 7, Dharmasthala 5, Kanjirappally & Uttamapalayam 4 each, Thiruvalla, Irinjalakuda, Periyakulam & Ambasundaram 3 each, Sulya, Mancompu, Mahabaleshwar & Palayamkottai 2 each, Ongole, Amini Divi, Hut Bay, Car Nicobar, Panruti, Nilakottai, Kuzhithurai, Thuckaley & Virudhunagar 1 each	Nagercoil & Chengannur 2 each, Vedaranniyam, Kuzhithurai, Mylaudy, Maya Bandar & Hut Bay 1 each	Banihal & Quazigund 5 each, Batote & Bhaderwah 4 each, Kukernag 3, Pahalgam & Satna 2 each, Ghamroor, Kalpa, Rewa, Sagar, Pamban, Tehri, Mukerian & Nangal 1 each

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
14.	Paravur, Punalur & Konni 8 each, Silchar 7, Dholai & Thiruvananthapuram 5 each, Kuzhithurai, Parangipettai, Pudukottai & Periyakulam 4 each, Sulur, Srimushnam, Paleni, Nilakottai, Aravakurichi, Madurai, Polur, Dharmasthala, Hut Bay & Madurai 3 each, Hubli, Gubbi, Tirupathi, Cochi, Dindigul, Vedasendur, Melur, Uttamapalayam, Ambasundaram & Vilathikulam 2 each, Car Nicobar, Nancowry, Cherrapunji, Sriniketan, Canning Town, Tiruchirappalli, Dharamapuram, Thiruvanamalai, Paramakudi, Chittampatti & Usilampatti 1 each	Peermade 3, Maya Bandar, Port Blair & Car Nicobar 2 each, Kozha, Lengpui & Hut Bay 1 each	Nagapattinam & Sirkali 13 each, Mayiladuthurai 12, Karaikal, Vedaranniyam, Thiruvavur & Chidambaram, 11 each, Tiruthuraiipoondi 9, Parangipettai & Muthupet 8 each, Kattumannarkoil, Valangaiman, Kodavasa, Adirampattinam & Cuddalore 7 each, Thanjavur, Nannilam & Tondi 6 each, Kumbakonam & Mannargudi 5 each, Pamban, Puducherry, Bhaderwah, Tiruvadanai & Papanasam 4 each, Srimushnam, Jayamkondan, Aranthangi, Karamabakudi, Ramanathapuram, Needamangalam & Kozha 3 each, Panruti, Vanur, Pudukottai & Tiruchirappalli, 2 each, Covelong, Ariyalur, Alangudi, Narsingpur, Kasol, Mandi, Rampur Bushar, Sujapur Tira, Sunni Bhajji, Shimla, Kodaikanal, Sundernagar & Kalpa Mukerian 1 each
15.	Deomali, Paravur & Chalakudy 6 each, Sattur, Namsai & Aryankavu 5 each, Udumalpet, Dindigul, Karur Paramarthy, Paramkudi & Idukki 4 each, Aravakurichi, Mayanur & Margherita 3 each, Ankola, Soro, Kohima, C. N, Halli, Chikodi, Phek & Manamadurai 2 each, Balasore, Gaya, Hut Bay, Nancowry, north Lakhimpur, Dibrugarh, Paradip, Shenkottai & Musiri 1 each	Gharmura, Dholai, Amraghat, Aizwal, Dharmanagar, Imphal & Lengpui 3 each, Kailashahar & Agartala 2 each, Lakhipur, Kohima, Karimganj & Lumding 1 each	Thiruvavur 12, Muthupet, Needamangalam & Thiruthuraiipoondi 9 each, Nannilam 8, Vallam & Adirampattinam 7 each, Vedaranyam, Alangudi, Keeranur, Tirukattupalli, Ambasundaram, Mannargudi & Nagapattinam 6 each, Sirkali, Aranthangi, Perungalur, Pudukottai, Papanasam, Thiruvaiyaru, Valangaiman & Kodavasa 5 each, Mayiladuthurai, Turvadanai & Tondi 4 each, Kattumannarkoil, Ariyalur, Jayamkondan, Tiruchirappalli & Pamban 3 each, Srimushnam, Toludur, Kodaikanal, Chatrapatti, Palani, Karaikal, Illupur, Kodaikanal & Nancowry 2 each, Chidambaram, Parangipettai, Madurai, Sattur, Sivakasi, Palayamkottai, Madurai & Car Nicobar 1 each
16.	Puri & Kahu 9 each, Basar, Chouldhowaghat & Paravur 7 each, Ron, Gharmura, Agartala, Kailashahar, Lengpui, Perumbavur, CIAL Cochi, North Lakhimpur, Nedumbassery, Pollachi & Ottapidaram 5 each, Sriniketan & Gorakhpur 4 each, Yelburga, Dibrugarh, Silchar, Imphal, Coimbatore, Naguneri & Perinaikanpalayam 3 each, Cherrapunji, Shillong, Sultanpur, Kandaghat, Tiruppur, Satyamanagalm & Arvakurichi 2 each, Dhubri, Jorhat, Nancowry, Gangtok, Purnea, Pantnagar, Bhanjar, Sangla, Avinashi, Sullur, Perundururai, Nagercoil, Sankarankoil, Shenkottah & Vilathikulam 1 each	Cherrapunji 15, Shillong 14, Agartala 10, Sonamura 7, Kailashahar & Belonia 6 each, Caning Town & Kohima 5 each, Bomdila, Phek, Dharmanagar & Silchar 3 each, Guwahati 2, Imphal, Lengpui, Haldia, Kolkata, Lumding & Jorhat 1 each	Nancowry 10, Car Nicobar 8, Hut Bay 6
17.	Cherrapunji 17, Muzaffarpur 15, Konni 10, Punalur 9, Sevoke 7, Kampur & Uttamapalayam 6 each, Watrap, Somwarpet, Ballupet, Chittur, Kollengode, Silchar & Dharampur 5 each, Uthagamandalam, Shokvandan & Thirumangalam 4 each, Kohima, Tuni, Usilampatti, Ketti & Thiruvananthapuram 3 each, Imphal, Digha, Dadahu, Sunnibhaji, Solan, Erode, Kuzhithurai, Coonoor & Kundha	Cherrapunji 6, Karimganj 5, Silchar 4, Lumding 3, Khonsa, Dharmanagar, Shillong, Golaghat & Margherita 2 each, Port Blair, Daporijo, Dibrugarh, Tezpur, North Lakhimpur, Jorhat, Khowang, Namaligarh, Neematighat, Bokajan, Badatighat, Chouldhowaghat,	Hut Bay 3

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
	Bridge 2 each, Gangtok, Tadong, Shillong, Passighat, Patiala, Gohar, Jubbal, Kotkhai, Sangla, Shimla, Kalpa, Kakinada, Narsapur, Machilipatnam, Yercaud, Periyakulam, Sankarankoil & Srivilliputhur 1 each	Dharamtul, Kampur, Sibsagar, Dhollabazar, Kohima, Kailashahar, Dharmanagar, Ziro, Bhalukpong & Bomdila 1 each	
18.	Devanahalli 13, Mylandi 11, Ramanathapuram, Kashinagar & Halebeedu 9 each, Karkala & Kothagiri 7 each, Chittur 6, Kayamkulam, Methupalayam & Coonoor 5 each, Cherrapunji, Solan, Kakinada, Kalingapatnam, Tuticorin, Kodaikanal, Bhavanisagar, Naduvattam, Nagercoil & Radhapuram 4 each, Parangipettai, Erode, Ketti, Kanyakumari, Tiruvadnai, Mudukulatur, Sathankulam, Mayiladuthurai, Maya Bandar, Passighat, Kaveli, Kanyakumari, Nilagiri, Shirali, Mysore, Bangalore & Perinthalmanna 3 each, Avinashi, Hosur, Kundha Bridge, Uthagamandalam, Eraniel, Ulundurpet, Paramkudi, Shillong & Coimbatore 2 each, Guler, Jubbal, Manali, Bhanvad, Puducherry, Nagapattinam, Hassan, Periyanaikanpalayam, Pollachi, Sathyamangalam, Gudalur Bazar, Kuzhthurai, Karaikal, Tindivanam, Adirampattinam, Shenkottah, Palayamkottai, Nanguneri, Muthupet, Kovilpatti & Tiruchendur 1 each	Khonsa 2, Port Blair 1	Sirkali 12, Mayiladuthurai 11, Parangipettai 9, Nannilam & Chidambaram, 8 each, Thiruvavur, Vallam & Karaikal 7 each, Cuddalore 6, Kattrumannarkoil & Puducherry 5 each, Sriperumbudur, Kumbakonam, Kodavasal, Mannargudi, Needamangalam & Adirampattinam 4 each, Jayamkondam, Papanasam, Thanjavur, Red Hills, Muthupet, Chennai & Nagapattinam 3 each, Tiruchirappalli, Tondi, Poondi, Alangudi & Vedaranyam 2 each, Pamban, Tirupathi, Panturi, Vanur, Tambaram & Lalgudi 1 each
19.	Bhalukpong & Ottapidaram 8 each, Kozhithurai 7, Thucklay, Ambasundaram & Cannur 6 each, Pipli, Vadakara, Kolkata, Balasore & Eraniel 5 each, Adirampattinam, Vilathikulam, Tiruvadanai, Koraput & Kodaikanal 4 each, Thovalai, Rasipuram, Nanguneri, Shenkottah, Tiruvadanai, Machilipatnam, Puducherry, Chouldhowaghat, Vedaranniyam, Thiruvananthapuram & Nedumbassery 3 each, Itanagar, Imphal, Palayamkottai, Raichur, Chickmagalur, Hosur, Pollachi, Denkanikottai, Athur, Sankaridurg, Manaparai, Vanur, Tirchengode & Sendamangalam 2 each, Agartala, Digha, Puri, Chandbali, Tondi, Dharampur, Tuticorin, Kanyakumari, Cuddalore, Kodaikanal, Bangalore, Cochi, Suler, Chidabaram, Dindigul, Melur, Tenkasi, Sankarankoil, Muthupet, Ketti, Arantangi, Coonoor, Kundha Bridge, Kovilpatti, Nagercoil, Mulanur, Sivakasi, Srivillipthur, Perungalur, Thirunayam, Tiruttani, Tindivanam & Tiruvarur 1 each	Tambaram 2, Chennai, Parangipettai, Sirkali, Vandavasi & Tindivanam 1 each	Dharapuram 27, Perungalur & Tozhudur 24 each, Panruti & Gingee 23 each, Natham & Palani 22 each, Vanthavasi 21, Thanjavur, Perundurai, Manaparai & Musiri 20 each, Keeranur, Villupuram & Dindigul 19 each, Papanasam & Aravakurichi 18 each, Chengalpattu, Thiruvaiyaru, Valangaiman, Needamangalam, Tiruchirappalli, Mettupatti, Chatrapatti & Nilakottai 17 each, Ulundurpet, Thirukattupalli & Kodaikanal 16 each, Jayamkondam, Kanchipuram, Kattumannarkoil, Thammampatti, Pudukooai, Lalgudi & Pullambadi 15 each, Kodavasal & Mannargudi 14 each, Alangudi, Virudhachalam, Tambaram, Karaikal, Kumbakonam, Nannilam, Ramanathapuram, Mulanur, Melur, Usilampatti & Ariyalur 13 each, Tambaram, Sriperumbudhur, Cuddalore, Vanur, Adirampattinam, Nagapattinam, Sirkali, Thiruvavur, Thirmayam, Kangeyam, Erode, Mayanur, Chittampatti, Thatheingarpatt, Puducherry & Nagapattinam 12 each, Thiruvallur, Tindivanam, Thriukoilur, Muthupet, Thiruthuraiipoondi, Harur, Pappireddipatti, Udumalpet & Redhills 11 each, Perundurai, Arantangi & Arakonam 10 each, Chidambaram, Mayiladuthurai, Polur, Vellore, Attur, Yercaud, Bhavani, Gobichettiyapalam, Perambalur, Thuraiyur, Periyakulam, Uthamapalayam, Poondi, Sholavandan, Sivagangai, Tondi, Vellore & Chennai 9 each, Parangipettai, Vallam, Shenkottai, Arani, Sathanurdam, Nammakal,

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
			Tiruppur, Cannur, Kulithalai & Watrap 8 each, Srimushnam, Tiruvadanai, Tenkasi, Thiruvannamali, Sholingir, Sendamangalam, Thiuchengode, Tirumangalam, Avinashi, Vedasandur, Uthagamangalam, Chettikulam, Salem & Madurai 7 each, Rasipuram, Kothagiri, Sankaridurg, Sankarankoil & Coimbatore 6 each, Periyanaickanpalayam, Sulur, Bhavanisagar, Sathyamangalam, Vedaranniyam, Karambakudi, Manamadurai, Radhapuram, Chengam, Sivakasi, Srivilliputhur, Virudhunagar & Ambur 5 each, Mettupalayam, Polachi, Pochampalli. Uthangari, Kudha Bridge, Mudukulathur, Omalur, Ambasundaram, Gudiyatham, Sattur, Vaniyambadi, Dharmapuri & Pamban 4 each, Nanguneri, Tirupaatur & Kaveli 3 each, Palacode, Thovalai, Ponneri, Kanyakumari & Nellore 2 each, Pennagaram, Mylaudi, Hosur, Naduvattam & Cochi 1 each
20.	Punalur & Thiruvananthapuram 16 each, Kuzhithurai 15, Haripad, Gubbi & Hiriyur 13 each, Kudalsangama 12, Thuckalai 11, Muthupet & Karipur 10 each, Honavar, Cannur, Alapuzha & Coonoor 9 each, Margherita, Coonoor & Gobichettipalayam 8 each, R. Udaigiri, Bhalukpong, Kundapur, Chitradurga, Mettupatti & Avinashi 7 each, Nedumbassery, Pamban, Erode, Kethi, Kothagiri & Virudhunagar 6 each, Toludur, Mylandi, Eraneil, Hosur, Perunduari, Thuraiyur, Kottayam & Adirampattinam 5 each, Bhavani, Pochampalli, Tiruchengode, Paramathi, Periyakulam, Sankarankoil, Srivillipur, Thovalai & Panruti 4 each, Vandavasi, Kovilpatti, Satlankulam, Kodaikanal, Sendamangalam, Nagercoil, Kanyakumari, Chittampatti, Ramanathapuram, Kangeyam, Kanyakumari, Vedaranniyam & Kakinada 3 each, Nandigama, Bapatla, Car Nicobar, Madurai, Coimbatore, Nagapattinam, Palayamkottai, Karkala, Chatrapatti, Tiruppur, Mettupalayam, Annur, Arantangi, Manaparai, Dharmapuri, Chettikulam, Chengalpaatu, Karaikal, Tirupattur, Polur, Arani, Kundha Bridge, Nanduvattam, Gudalur, Bazar, Yercaud, Uthagamandalam, Kamudhi, Palayamkottai, Kumbakonam, Perambalur, Karambakudi & Agumbe 2 each, Turuvadanai, Needamangalam, Nanmila, Musiri, Gingee, Pollachi, Periyanaickanpalayam, Udumalpet, Kulithulai, Sankaridurg, Omalur, Papanasam, Watrap, Sattur, Cuddalore, Denkanikottai, Viralimalai, Tiruvaiyaru, Krishnagiri, Gudiyatham, Ambur, Sirkali, Tindivanam, Port Blair, North Lakhimpur, Imphal, Narsapur, Tiruchirappalli, Cuddalore & Karwar 1 each	Satyavedu 8, Kanchipuram 7, Tambaram, Gingee & Chennai 5 each, Karaikal, Puducherry, Tirupathi, Erode, Chengalpattu & Poondi 4 each, Panruti, Sriperumpudhur, Kumbakonam, Papanasam, Ponneri, Trivallur, Tiruvannamalai, Sholingir, Vanur, Villupuram, Pamban & Vellore 3 each, Kattumannarkoil, Mayiladuthurai, Sirkali, Hessarghatta & Maya Bandar 2 each, Kaveli, Cuddalore, K. R. Sagar, Bagepalli, Cuddapah, Arogyavaram & Nagapattinam 1 each	Sathanur Dam & Tirukoilur 21 each, Virudhuchalam & Kodaikanal 20 each, Ponneri 18, Satyavedu & Chengam 17 each, Tiruvannamalai & Ulundurpet 16 each, Redhills, Arani, Gudiyatham, Vellore & Tirupathi 14 each, Palani, Ketti, Polur & Chittoor 13 each, Vandavasi & Ambur 12 each, Uthangari, Coonoor & Ambasamudram 11 each, Dindigul, Dharapuram, Mulanur, Poondi, Tiruttani, Arakonam & Vaniyambadi 10 each, Panruti, Harur, Chatrapatti, Sathyamangalam, Bhavanisagar, Kangeyam, Chengalpattu, Kanchipuram, Pochampalli, Sirkali, Kothagiri, Periyakulam, Tiruvallur & Arogyavaram 9 each, Udumalpet, Kattumannarkoil, Perundurur, Krishnagiri, Sholingir, Kamudhi, Tiruppuvanam, Thammanpatti & Virudhunagar 8 each, Tiruppur, Srimushnam, Toludur, Palacode, Pappireddipatti, Natham, Erode, Madurai City, Mudukulathur, Paramkudi, Yercaud, Uthamapalayam, Thathiengarpatt, Gingee & Chennai 7 each, Avinashi, Nilakottai, Vedasandur, Gobichettipalayam, Sriperumbudur, Tambaram, Aravakurichi, Melur, Sholavandan, Usilampatti, Tiruvarur & Watrap 6 each, Mettupalayam, Sulur, Pollachi, Dharmapuri, Karur Paramathi, Hosur & Chittampatti

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
			5 each, Periyanaikanpalayam, Pennagaram, Kulithalali, Denkanikottai, Mettupatti, Namakkal, Paramathi, Tiruchengode, Jayamkondan, Perambalur, Ramanathapuram, Arthur, Omalur, Tirukattupalli, Tiruvaiyaru, Tiruthuraiipoondi, Pullambadi, Tuticorin, Kovilpatti, Tirupathur, Villupuram, Sathur, Srivilliputhur, Coimbatore, Karaikal & Madurai 4 each, Bangalore, Puducherry, Salem, Nellore, Chidambaram, Vanur, Bhavani, Naduvattam, Ariyalur, Chettikulam, Thirumayam, Papanasam, Vallam, Lalgudi, Thuraiyur, Manaparai, Tiruchendur & Tindivanam 3 each, Mysore, Pamban, Tiruchirapalli Vedaranyam, Nangumeri, Muthupet, Musiri, Ottapidaram, Sathankulam, Vilathikulam & Srivaikuntam 2 each, Parangipettai, Mayanur, Arantangi, Viralimalai, Keeranur, Perungalur, Pudukottai, Nagapattinam, Cuddalore, Anantpur, Thanjavur & Tenkasi 1 each
21.	Molkalmuru 15, Vadakara 14, Mannarkad 10, Uthanagiri 9, Shivani & Kozhikode 8 each, Mudibidre, Kiravati & Kariapur 7 each, Bhavanisagar & Cannur 6 each, Kamadhi, Pochampalli, Thiruvaiyur, Bangalore & Chitradurga 5 each, Omalur, Denkanikottai, Toludur, Mudululathur & Nedumbassery 4 each, Manamadurai, Hosur, Rasipuram, Thiruthuraiipoondi, Kodaikanal, Paramakudi, Palani, Bapatla, Nellore, Tuni & Imphal 3 each, Thuraiyur, Ramanathapuram, Nilakottai, Valangaiman, Papanasam, Tirukattupalli, Yeracaud, Parangipettai, Krishnagiri, Gobichettipalayam, Sendamangalm, Mayanur, Tiruchengode, Ariyalur, Perungalur, Sankaridurg, Malkangiri, Khonsa, Dillighat & Gadag 2 each, Naduvattam, Dharmapuri, Pudukottai, Sivaganga, Pullambadi, Karambakudi, Pappireddipatti, Harur, Kuzhithurai, Vallam, Chettikulam, Kumbakanam, Mannargudi, Thanjavur, Mettupalayam, Palacode, Mayiladuthurai, Gudalur Bazaar, Vandavasi, Vaniyambadi, Shalingur, Neelamangalam, Tindivanam, Lengpui, Pamban, Puducherry, Cochi & Thiruvananthapuram 1 each	Vedaranniyam 9, Sirkali 7, Tiruchirapalli & Mayiladuthurai 6 each, Long Islands & Valangaiman 5 each, Mulanur, Karur Paramathi, Kumbakonam, Thiruvaiyaru, Poondi & Tiruvallur 4 each, Pamban, Kattumannarkoil, Parangipettai, Vanur, Jayamkondan, Thanjavur, Tirukattupalli, Tirukoilur & Tambaram 3 each, Chengannur, Thodupuzha, Punalur, Thiruvananthapuram, Pamban, Puducherry, Chennai Chidambaram, Harur & Pappireddipatti 2 each, Coonoor, Cuddalore, Adirampattinam, Palayamkottai, Nagapattinam, Pondicherry, Vallam, Thiruvananthapuram & Ongole 1 each	Agathi 15, Kavaratti 13, Ketti 12, Arantangi 11, Tirupattur 10, Coonoor & Pudukottai 8 each, Musiri 7, Bhavanisagar, Mayanur, Alangudi & Tiruvadani 6 each, Dindigul, Kulithalai, Kothagiri, Karambakudi, Tirumayam, Kamudhi, Manaparai, Ambur, Srivilliputhur, Virudhunagar Amini Divi & Tondi 5 each, Kodaikanal, Madurai, Nilakottai, Gobichettipalayam, Chittampatti, Sholavandan, Tirumangalam, Uthagamandalam, Mudukulathur, Ramanathapuram, Tiruppuvanam & Vilathikulam 4 each, Ajjampura, Shivani, Tiruchirapalli, Palacode, Natham, Illuppur, Viralimalai, Keeranur, Perungallur, Karur Paramathi, Denkanikottai, Madurai Airport, Melur, Usilampatti, Paramathi, Kundha Bridge, Manamadurai, Sivaganga, Thajavur, Sankarankoil, Mannargudi, Needamangalam, Lalgudi, Gudiyatham, Sivakasi & Watrap 3 each, Mettupalayam, Srimushnam, Pennagaram, Chatrapatti, Palani, Vedasandur, Mulanur, Perundurur, Sathyamangalam, Aravakurichi, Namakkal, Rasipuram, Karaikal, Paramakuri, Salem, Yeracaud, Tirukattupalli, Tiruvaiyaru, Vallam, Periyakulam, Uthamapalayam, Shenkottah, Kodavasal, Nannilam, Kovilpatti, Ottapidaram, Sathur Pamban, M. M. Hills, Kolar,

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
			Dharmapuri, Minicoy & Karaikal 2 each, Coimbatore, Vellore, Bangalore, Avinashi, Periyannaikanpalayam, Pollachi & Sullur Kupwara 1 each
22.	Dharmasthala 15, Virudhunagar 11, Subramanya, Belur, Piravom & Avanigadda 10 each, Kandukur 9, Shivani 8, Athur 7, Tirupattur, Alangudi, Anantangi & Chalakudy 6 each, Chatrapatti, Sivakasi, Karambakudi, Dharapuram, Ongole, Nellore & Madurai 5 each, Alapuzha, Chitradurga, Dindigal & Sathanur Dam 4 each, Kokrajhar, Sawantwadi, Chickmagalur, Cochi, Kethi, Mulanur, Ponneri, Keeranur, Chengam, Watrap & Toludur 3 each, Kudal, Medikeri, Hassan, Mandya, Machilipatnam, Bapatla, Kaveli, Narsapur, Rentachintala, Tiruchirapalli, Belgaum, Sholavandan, Tirumangalam, Pullambadi, Palanai, Thanjavur, Periyannaikanpalayam, Tiruchirapalli, Rasipuram, Coimbatore, Tirukathupalli, Perungallur, Musin, Tirukoilur, Kovilpatti, Kodaikanal & Tondi 2 each, Gangtok, Vijaywada, Nalgonda, Visakhapatnam, Chennai, Tondi, Cuddalore, Kodaikanal, Bellary, Raichur, Kottayam, Kariapur, Sivaganga, Srivilliputtur, Tiruvannamalai, Ulundur Pet, Sethur, Nungambakkam, Cuddalore, Paramakudi, Usilampatti, Srimushnam, Sankaridurg, Lalgudi, Udumalpet, Vilathikulam, Sullur, Nilakottai, Parangipettai, Gobichettipalayam & Thuraiyur 1 each	Pamban 6, Minicoy 3, Ambasamudram 2, Palayamkottai & Port Blair 1 each	Sankarankoil 6, Kavaratti & Minicoy 4 each, Amini Divi & Ambasamudram 3 each, Nancowry, Agathi, Uttamapalayam & Shenkottah 2 each, Watrap 1
23.	Pamban 18, Sullur 11, Vadakara 10, Kandukur, Sivakasi & Panruti 9 each, Amini Divi & Madurai 9 each, Coimbatore & Kaveli 8 each, Dholai, Sravanabelgola, Kakinada, Kovilpatti & Villupuram 7 each, Udumalpet, Gingee, Ramanathapuram, Virudhanagar & Silchar 6 each, Palani, Krishnagiri & Honavar 5 each, Koraput, Valpoi, Tuticorin, Mettupatti, Ottapidaram, Sathuri, Srivilli puthur, Tindivanam, Tuticorin & Cochi 4 each, Kudal, Alapuzha, Agumbe, Tadong, Gangtok, Cuddalore, Kodaikanal, Palayamkottai, Avinashi, Tiruppur, Ulundurpet, Sankaridurg, Dindigul, Nilakottai, Annur, Tiruchengode, Sathanur Dam, Sankarankoil, Vilathikulam, Toludur, Cuddalore, Uthangarai, Chengalpattu & Srimushnam and Puducherry 3 each, Ongole, Vedaranniyam, Nagapattinam, Karaikal, Chickmagalur, Mysore, Periyannaikanpalayam, Kattumannarkoil, Chidambaram, Aravakurichi, Watrap, Srivaikuntam, Chengam, Parangipettai, Karaikal, Pollachi, Erode, Nannilam, Chatrapatti, Vanur, Dharapuram, Tirukoilur, Vedasandur, Kumbakonam, Tiruchendur, Mayiladuthurai, Sirkali, Tiruvannamalai, Tirupathur, Kangeyam, Mettupalayam, Kamudhi, Paramakudi, Vandavasi & Tondi 2 each, Machilipatnam, Nellore, Tirupathi, Dharmapuri, Hut Bay, Panjim, Vellore, Mangalore, Raichur, Bangalore, Mandya, Nedumbassery, Minicoy, Pappireddipatti, Yercaud, Arani, Vellore, Ponneri, Manamadamurai & Palacode 1 each	Manamadamurai & Hut Bay 2 each, Radhapuram & Tiruchendur 1 each	Barmer 1
24.	Sirkali 23, Chidambaram & Karaikal 17 each, Nagapattinam 16, Vedaranniyam 15, Toludur 14, Parangipettai 13, Venkatagiri Town 12, Tada, Tiruvarur, Nannilam, Mayiladuthurai & Puducherry 10 each, Kattumannarkoil, Muthupet, Kodavasal, Kumbakonam, Mannargudi, Valangaiman & Tirupathi 9 each, Papanasam, Thirukattupalli, Needamangalam, Tiruvaiyaru, Thiruthurai, Ariyalur & Jayamkondan 8 each, Agathi, Perambalur, Villupuram, Virudhachalam, Thanjavur, Thuraiyur, Ulundurpet & Adirampattinam 7 each, Gulbarga, Pullambadi, Lalgudi & Vanur 6 each,	Mancompu 9, Kayamkulam 8, Kozha 7, Thodupuzha 6, Cherthala, Enamackel & Alapuzha 5 each, Mavelikara 4, Kollam 3, Hut Bay & Car Nicobar 1 each	Nil

TABLE 5(Contd.)

(1)	(2)	(3)	(4)	
	Salem, Kumarakom, Tiruchirapalli, Cuddalore Srimushnam, Kethi, Ramanathapuram, Mayanur, Yercaud, Tiruvallur, Arantangi, Perungalur, Cuddalore, Thathiengarpet, Panruti, Karambakudi & Gingee 5 each, Pochampalli, Paramathi, Tiruchengode, Poondi, Vaniyambadi, Kodaikanal, Athur, Dharmapuri, Uthangarai, Viralimalai, Alangudi, Denkanikottai, Ambur, Kothagiri, Pudukottai, Keeranur & Tiruvannamalai, Vallam & Nellore 4 each, Pappireddipatti, Sathanur Dam, Kancheepuram, Musiri, Coonoor, Tirumayam, Chengam, Pennagaram, Perundurai, Manaparai, Polur, Erode, Tirukoilur, Harur, Bhavanisagar, Karur, Paramathi, Rasipuram, Kundha Bridge, Sendamangalam, Ponneri, Kulithalai, Omalur, Tiruvadanai, Chengalpattu, Chettikulam, Krishnagiri & Mangalore 3 each, Tondi, Hut Bay, Nancowry, Kolhapur, Sangli, Karipur, Sriperumbudhur, Uthagamandalam, Dindigul, Tambaram, Palacode & Tirupathur 2 each, Kaveli, Anantpur, Tadong, Gangtok, Chennai, Kanyakumari, Melur, Namkkal, Tiruttani, Sivaganga, Dharapuram, Vellore, Bijapur, Chitradurga, Bangalore, Cannur & Alapuzha 1 each			
25.	Mayiladuthurai 21, Chidambaram 20, Kattumannarkoil 19, Kaveli 18, Kodaikanal 15, Parangipettai & Tiruvadanai 14 each, Arantangi, Uthamapalayam & Sankarankoil 13 each, Tuticorin 12, Sirkali, Nannilam, Konni & Karaikal 11 each, Kanjirappally 10, Paravur, Munnar, Cuddalore, Karambakudi, Periyakulam, Kovilpatti & Virudhunagar 9 each, Tondi, Jayamkondan, Tenkasi, Vilathikulam & Gingee 8 each, Nellore, Kodavasal, Shenkottah & Tiruvarur 7 each, Coonoor, Dindigul, Thiruthuraiipoondi, Virudhachalam, Srimushnam, Kethi, Ambasamudram, Kumbakonam & Watrap 6 each, Natham, Thirumangalam, Usilampatti, Madurai, Thiruppuvanam, Needamangalam, Keeranur, Ulundurpet, Sathur, Amini Divi, Kozhikode, Puducherry & Madurai 5 each, Nagapattinam, Adirampattinam, Pennagaram, Dharmapuri, Palani, Panruti, Villupuram, Manamadurai, Valagaiman, Sholavandan, Melur, Thirumayam, Alangudi, Mannargudi, Palayamkottai, Srivilliputhur & Sivakasi 4 each, Hut Bay, Yercaud, Tindivanam, Vanur, Tirukoilur, Thanjavur, Nilakottai, Papanasam, Vallam, Uthagamandalam, Chittampatti, Kundha Bridge, Perungallur, Toludur, Athur, Pollachi, Muthupet, Mettupatti & Ponneri 3 each, Chitradurga, Tiruchirapalli, Vedaranyam, Poondi, Kanyakumari, Thiruvananthapuram & Karipur 2 each, Chennai, Vellore, Hosur, Karur Paramarthy, Nedumbassery, Cochi & Alapuzha 1 each	Thiruvananthapuram 8, Konni & Maya Bandar 5 each, Long Islands & Car Nicobar 2 each, Kanjirappally, Neyyattinkara & Hut Bay 1 each		
26.	Venkatagiri Town 10, Rapur 8, Panruti, Omalur & Cuddalore 7 each, Vedaranniyam, Nannilam & Yercaud 6 each, Srivaikuntam, Kattumannarkoil, Radhapuram, Tindivanam, Gingee, Puducherry, Nagapattinam & Parangipettai 5 each, Chidambaram, Arakonam, Pappireddipatti, Udupi, Piravom, Lakkavalli & Kaveli 4 each, Srimushnam, Vallam, Chengam, Kothagiri, Kethi, Vanur, Tirukoilur, Thanjavur, Tiruvallur, Kodavasal, Needamangalam, Mannargudi, Hut Bay, Port Blair, Nancowry & Adirampattinam 3 each, Car Nicobar, Karaikal, Salem, Pamban & Chennai 2 each, Vellore, Thiruchirapalli, Manaparai, Uthagamandalam, Mysore, Chickmagalur, Amini Divi & Agathi 1 each	Maya Bandar & Car Nicobar 2 each, Nil Hut Bay 1		
27.	Jayamkondan 13, Parambikulam 12, Chidambaram, Parangipettai, Kethi & Kodavasal 11 each, Mayiladuthurai 10, Kattumannarkoil, Nannilam, Gudur, Rapur &	Car Nicobar 4, Maya Bandar & Nil Nancowry 2 each, Hut Bay 1		

TABLE 5(Contd.)

(1)	(2)	(3)	(4)
	Venkatagiri Town 9 each, Ariyalur & Quilandy 8 each, Srimushnam, Coonor, Kothagiri, Needamangalam, Perinthalmanna, Karaikal & Kaveli 7 each, Thiruvarur, Mannargudi, Thiruthuraiipoondi, Uthagamandalam, Valangaiman, Nellore & Kozhikode 6 each, Nagapattinam, Sirkali, Perambalur, Thathiengarpet, Gingee & Tiruvaiyur 5 each, Car Nicobar, Thuraiyur, Papanasam & Musiri 4 each, Toludur, Vedaranniyam, Polur, Sular & Tiruppur 3 each, Puducherry, Chennai, Adirampattinam, Coimbatore, Karur Paramarthy, Arakonam, Coimbatore, Tiruchirapalli, Hut Bay & Nancowry 2 each, Cuddalore, Vellore, Arantangi, Pudokottai, Harur, Alangudi, Tuticorin, Cannur & Minicoy 1 each		
28.	Arsikere 15, Sravanabalgola 14, Usilampatti & Hut Bay 12 each, Mayanur 11, Sullurpet, Kumbakonam, Kodavasal, Dharmasthala & Arkalgud 10 each, Peermade 9, Bhanavani, Mudukulathur, Tirumangalam & Karipur 8 each, Nilakottai, Kamuthi, Tiruvaiyur, Valangaiman, Nannilam, Pullambadi & Kovilapatti 7 each, Radhapuram, Erode, Jayamkondam & Madurai 6 each, Thiruvarur, Namakkal, Kozhikode & Karaikal 5 each, Ponneri, Natham, Papanasam & Red Hills 4 each, Nagapattinam, Thanjavur, Chennai, Salem, Cuddalore, Tirupathi, Car Nicobar & Nedumbassery 3 each, Tambaram, Sriperumbudur, Watrap, Kodaikanal, Tondi, Nellore, Honavar & Minicoy 2 each, Nancowry, Port Blair, Puducherry, Palacode, Vallam, Tiruttani, Vedaranniyam, Alapuzha, Amini Divi & Agathi 1 each	Tirupathi, Nancowry, Tambaram, Nil Ponneri & Car Nicobar 1 each	
29.	Srikalahasti 27, Nellore & Gudur 22 each, Kaveli 20, Tirupathi 18, Thiruvallur & Red Hills 16 each, Chengalpattu 15, Chennai 14, Sriperumbudur 13, Tambaram 12, Kanchipuram, Ponneri & Vandavasi 11 each, Poondi, Aralonam & Kunnamkulam 10 each, Tiruttani, Arani, Sholingir, Irinjalakuda & Vellore 9 each, Gingee 8, Agathi 7, Nedumbassery, Gudiyatham & Puducherry 6 each, Tindivanam, Villupuram, Polur, Vanur, Tiruvannamali & Ambur 5 each, Vanivambadi, Thiruthuraiipoondi & Minicoy 4 each, Chengam, Chatrapati, Sataur Dam, Metupatti, Tiruvadana, Krishagiri, Amini Divi, Alapuzha & Cochi 3 each, Hosur, Toludur, Cannur, Karipur, Kozhikode, Cuddalore & Bangalore 2 each, Tondi, Adirampattinam, Coimbatore, Port Blair, Car Nicobar & Anantpur 1 each	Shenkottah 8, Tenkasi 3, Thoovilai & Karaikal 2 each, Nagapattinam & Pamban 1 each	
30.	Kaveli 35, Nellore 17, Piravom 14, Rapur & Gudur 13 each, Parlakhemudi 9, Thrissur 8, Agathi 7, Nedumbassery 6, Ongole 5, Cochi, Bapatla, Tirupathi, Port Blair, Shenkottah & Minicoy 4 each, Amini Divi & Thiruvananthapuram 3 each, Alapuzha, Karipur, Cannur, Visakhapatnam, Sular, Coonoor, Nancowry, Cannur & Bangalore 2 each, Narsapur, Machilipatnam, Anantpur, Kozhikode, Adirampattinam, Uthagamandalam, Ponneri, Kanyakumari, Chennai, Hut Bay & Car Nicobar 1 each	Kottayam 5, Haripad, Cochi & Thiruvalla 4 each, Kasargod 3, Sathankulam & Tuticorin 2 each, Batala, Katra, Mulki, Amritsar, Jammu, Tondi, Radhapuram & Tiruchendur 1 each	Nil
31.	Ichhapuram 11, Kalwakurthy 10, Parlakhemundi 9, Gopalpur 8, Cuddalore 7, Berhampur 6, Krishnaprasad 5, Narsapur, Machilipattinam, Panruti, Adirampattinam & Kalingapatnam 4 each, Bapatla, Puri & Vedaranniyam 3 each, Vijayawada, Bhubaneshwar, Paradip & Bangalore 2 each, Balasore, Chandbali, Ongole, Visakhapatnam, Puducherry, Villupuram, Hyderabad, Digha & Cochi 1 each	Nil	Hut Bay 3, Car Nicobar & Nancowry 1 each

TABLE 6

Dates of occurrence of heat wave/severe heat wave and various categories of maximum temperatures - October 2007

No	Sub-division		Dates (Number of days)					
	Name	Severe heat wave	Heat wave	Hot day	Appreciably above normal	Above normal	Appreciably to markedly below normal	Below normal
2.	Arunachal Pradesh	Nil	Nil	Nil	26 (1)	28 (1)	Nil	Nil
3.	Assam & Meghalaya	Do	Do	Do	26, 30, 31 (3)	22, 23, 24, 25, 26, 27, 28, 29 (8)	Do	Do
4.	Naga., Mani., Mizo. and Tripura	Do	Do	Do	Nil	27, 28, 30, 31 (4)	Do	Do
5.	S. H. W. B. & Sikkim	Do	Do	Do	30, 31 (2)	27, 31 (2)	22, 23, 24, 25 (4)	Do
6.	Gangetic West Bengal	Do	Do	Do	Nil	25, 28, 30, 31 (4)	Nil	Do
7.	Orissa	Do	Do	Do	22 (1)	23, 24, 29, 30 (4)	Do	Do
8.	Jharkhand	Do	Do	Do	23 (1)	14, 20, 24, 25 (4)	Do	Do
9.	Bihar	Do	Do	Do	Nil	30 (1)	Do	18 (1)
10.	East Uttar Pradesh	Do	Do	Do	23 (1)	9, 11, 12, 14, 15, 22, 24, 25, 29, 30, 31 (11)	17 (1)	16, 18 (2)
11.	West Uttar Pradesh	Do	Do	Do	4, 5, 6, 7, 9, 23 (6)	8, 10, 11, 12, 30 (5)	Nil	17 (1)
12.	Uttarakhand	Do	Do	Do	4, 5, 13, 14, 26, 30, 31 (7)	3, 5, 6, 9, 10, 11, 25 (7)	Do	18 (1)
13.	Haryana, Chandigarh & Delhi	Do	Do	Do	4, 5 (2)	6, 14, 15, 16, 23 (5)	Do	18 (1)
14.	Punjab	Do	Do	Do	15, 16 (2)	7, 14 (2)	Do	18, 19, 20 (3)
15.	Himachal Pradesh	Do	Do	Do	4, 6, 7, 9, 14, 15, 26, 29, 30 (9)	10, 11, 19, 20, 23, 25, 27, 28, 29, 31 (10)	Do	22 (1)
16.	Jammu & Kashmir	Do	Do	Do	9, 12, 24, 26, 30 (5)	10, 16, 19, 21, 25, 26, 27 (7)	Do	18 (1)
17.	West Rajasthan	Do	Do	Do	1, 2, 3, 4, 26, 30 (6)	2, 15, 25, 27, 28, 29 (6)	Do	10, 23 (2)
18.	East Rajasthan	Do	Do	Do	3, 4, 5, 7, 30, 31 (6)	6, 8, 15, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31 (13)	Do	Nil
19.	West Madhya Pradesh	Do	Do	Do	9, 11, 12, 15, 19, 22, 23, 25 (8)	3, 8, 10, 12, 13, 14, 15, 16, 17, 18, 20, 21, 23, 24, 25, 26, 28, 29, 30, 31 (20)	Do	Do
20.	East Madhya Pradesh	Do	Do	Do	11, 12, 22, 23, 24, 25 (6)	10, 12, 13, 16, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31 (17)	Do	Do
21.	Gujarat Region	Do	Do	Do	27, 30 (2)	3, 14, 17, 20, 24, 25, 29, 31 (8)	6 (1)	Do
22.	Saurashtra & Kutch	Do	Do	Do	14, 19, 20, 21, 26, 27, 28, 29, 30, 31 (10)	3, 16, 17, 18, 21, 23, 27 (7)	6 (1)	Do
23.	Konkan & Goa	Do	Do	Do	20, 23, 24, 26, 27, 28, 29 (7)	21, 23, 24, 25, 28, 30, 31 (7)	Nil	Do
24.	Madhya Maharashtra	Do	Do	Do	16, 18, 19, 24 (4)	9, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 30, 31 (18)	Do	30 (1)
25.	Marathwada	Do	Do	Do	Do	13, 19, 20, 22, 23, 24, 25, 26, 31 (9)	Do	30 (1)
26.	Vidarbha	Do	Do	Do	23, 30 (2)	13, 17, 19, 20, 21, 22, 25, 26 (8)	Do	Nil
27.	Chattisgarh	Do	Do	Do	25 (1)	26, 28, 30, 31 (4)	Do	Do
28.	Coastal Andhra Pradesh	Do	Do	Do	Nil	29 (1)	23, 29, 30 (3)	24, 26, 30 (3)
29.	Telangana	Do	Do	Do	Do	23, 28, 29 (3)	Nil	Nil
30.	Rayalaseema	Do	Do	Do	Do	Nil	24, 25, 27, 29, 30, 31 (6)	23, 24, 26, 31 (4)
31.	Tamil Nadu	Do	Do	Do	Do	30, 31 (2)	25, 26, 27, 29 (4)	23, 26, 28, 30, 31 (5)
32.	Coastal Karnataka	Do	Do	Do	23, 26, 28 (3)	23, 27, 28 (3)	Nil	Nil
33.	North interior Karnataka	Do	Do	Do	Nil	Nil	26, 30 (2)	23, 30, 31 (3)
34.	South interior Karnataka	Do	Do	Do	Do	Do	25, 26, 27, 30, 31 (5)	23, 24, 28, 29, 30, 31 (6)
35.	Kerala	Do	Do	Do	Do	22, 23 (2)	30, 31 (2)	Nil

TABLE 7

Dates of occurrence of cold wave/severe cold wave and various categories of minimum temperatures - October 2007

No	Sub-division Name	Dates (Number of days)						
		Severe cold wave	Cold wave	Cold day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
2.	Arunachal Pradesh	Nil	Nil	Nil	Nil	Nil	Nil	Nil
3.	Assam & Meghalaya	Do	Do	Do	Do	22, 24, 25, 26, 27 (5)	Do	23, 30 (2)
4.	Naga., Mani., Mizo. and Tripura	Do	Do	Do	23, 25, 26, 27, 28, 30 (6)	23, 24, 27, 29 (4)	31. (1)	Nil
5.	S. H. W. B. & Sikkim	Do	Do	Do	Nil	Nil	29, 30 (2)	23, 26, 28 (3)
6.	Gangetic West Bengal	Do	Do	Do	Do	Do	Nil	31 (1)
7.	Orissa	Do	Do	Do	24, 25, 26 (3)	22, 25, 27 (3)	Do	31 (1)
8.	Jharkhand	Do	Do	Do	21, 23, 24, 25, 26 (5)	22, 23 (2)	Do	18, 31 (2)
9.	Bihar	Do	Do	Do	12, 14, 23, 24, 26 (5)	24 (1)	29, 30 (2)	Nil
10.	East Uttar Pradesh	Do	Do	Do	9, 10, 11, 12, 16 (5)	2, 13, 14, 21, 23 (5)	Nil	15, 16, 19, 28, 29, 30 (6)
11.	West Uttar Pradesh	Do	Do	Do	4, 9, 10 (3)	11, 12, 13 (3)	Do	5, 15, 28, 29, 31 (5)
12.	Uttarakhand	Do	Do	Do	Nil	9, 17, 18, 23 (4)	Do	15, 31 (2)
13.	Haryana, Chandigarh & Delhi	Do	Do	Do	2, 4, 9, 10, 11, 12, 14, 15 (8)	3, 5, 13, 21, 22, 29, 31 (7)	Do	27, 28 (2)
14.	Punjab	Do	Do	Do	2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 30 (13)	3, 13, 17, 18, 19, 20, 21, 22, 24, 29, 31 (11)	Do	27 (1)
15.	Himachal Pradesh	Do	Do	Do	30 (1)	6, 16, 17 (3)	Do	26, 28 (2)
16.	Jammu & Kashmir	Do	Do	Do	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16 (13)	3, 13, 15, 16, 17, 18, 19, 20, 27 (9)	Do	Nil
17.	West Rajasthan	Do	Do	Do	9, 11, 12, 14, 17 (5)	3, 5, 10, 15, 16, 18, 19, 30 (8)	23, 24, 25, 26, 29 (5)	1, 3, 4, 7, 8, 21, 27, 28, 30, 31 (10)
18.	East Rajasthan	Do	Do	Do	2, 8, 9, 11, 12, 14, 16, 17 (8)	3, 5, 6, 7, 10, 13, 15, 16, 18, 19, 20, 30 (12)	24, 29 (2)	3, 28, 30, 31 (4)
19.	West Madhya Pradesh	Do	Do	Do	11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26 (13)	8, 10, 12, 13, 14, 16, 17, 21, 23, 24, 25 (11)	Nil	Nil
20.	East Madhya Pradesh	Do	Do	Do	15, 16, 17, 21 (4)	2, 10, 11, 12, 14, 16, 17, 21, 22, 24, 27 (11)	Do	31 (1)
21.	Gujarat Region	Do	Do	Do	6, 16, 18, 19, 20, 21, 22, 23 (8)	7, 14, 17, 23, 27, 30 (6)	Do	9, 10, 11, 12, 13, 26, 27, 29 (8)
22.	Saurashtra & Kutch	Do	Do	Do	4, 6, 16, 19, 21 (5)	7, 17, 23 (3)	26, 30 (2)	8, 9, 12, 13, 14, 15, 27, 28, 29, 31 (10)
23.	Konkan & Goa	Do	Do	Do	Nil	Nil	Nil	28, 30 (2)
24.	Madhya Maharashtra	Do	Do	Do	15, 16, 18, 19, 20, 23, 27 (7)	14, 17, 22, 26, 28, 29, 30 (7)	Do	12, 31 (2)
25.	Marathawada	Do	Do	Do	16, 27 (2)	24, 26, 27, 28, 30 (5)	Do	31 (1)
26.	Vidarbha	Do	Do	Do	15, 16, 17, 21, 22, 23, 24, 26, 27, 28 (10)	24, 28, 30 (3)	Do	31 (1)
27.	Chattisgarh	Do	Do	Do	12, 21, 23, 25, 26 (5)	15, 30 (2)	Do	Nil
28.	Coastal Andhra Pradesh	Do	Do	Do	26 (1)	30 (1)	Do	31 (1)
29.	Telangana	Do	Do	Do	28 (1)	29, 30 (2)	23 (1)	22, 23, 31 (3)
30.	Rayalaseema	Do	Do	Do	Nil	26 (1)	Nil	22, 27 (2)
31.	Tamil Nadu	Do	Do	Do	Do	22, 23, 26, 28, 29 (5)	Do	31 (1)
32.	Coastal Karnataka	Do	Do	Do	Do	Nil	Do	22, 23, 27 (3)
33.	North interior Karnataka	Do	18	Do	Do	30 (1)	Do	Nil
34.	South interior Karnataka	Do	18	Do	Do	30 (1)	Do	Do
35.	Kerala	Do	Do	Do	Do	23, 30 (2)	Do	Do

Tamil Nadu

27 Oct 2007	Jayamkondam 14, Parangipettai 11.
28 Oct 2007	Usilampatti 12, Mayanur 11.
29 Oct 2007	Tiruvallur, Red Hills 16, Chengalpattu 15.

18 people lost their lives in Nellore district of coastal Andhra Pradesh. Paddy and other crops over thousands of acres of land were affected. Thousands of houses were either fully / severely damaged. Lakhs of population was affected. Several irrigation projects were overflowed. Roads were washed away. Traffic and transport was disrupted. Damage worth crores of rupees is estimated. In Tamil Nadu, 8 persons died due to heavy rain and electrocution. Paddy field in 1500 acres were submerged.

3.1.4. *Other synoptic features and associated weather*

Table 2 gives the summary of synoptic features for the month of October 2007. The sub-divisionwise percentage departure from normal and significant amounts of rainfall are given respectively in Tables 1 & 5.

Southwest monsoon was *vigorous* on 1 day each in Nagaland-Manipur-Mizoram-Tripura, east Madhya Pradesh, Konkan & Goa, Telangana and coastal Andhra Pradesh; *active* on 3 to 4 days in Assam & Meghalaya, Jharkhand and Bihar and on 1 to 2 days in Nagaland-Manipur-Mizoram-Tripura, Orissa, east Madhya Pradesh, Chattisgarh, coastal Andhra Pradesh, Rayalaseema and Telangana. Subsequently, the northeast monsoon was *vigorous* on 3 days in Rayalaseema and 2 days each in Tamil Nadu, coastal & south interior Karnataka, Kerala and coastal Andhra Pradesh. It was *active* on 1 to 3 days in Rayalaseema, Tamil Nadu, coastal & south interior Karnataka and Kerala and on 1 day in coastal Andhra Pradesh.

Extremely heavy rain occurred on 2 days in coastal Andhra Pradesh and on 1 day in Rayalaseema. *Very heavy rain* occurred on 5 days in Tamil Nadu, 4 days in south interior Karnataka, 3 days in Kerala, 2 days in Assam & Meghalaya, Chattisgarh and coastal Andhra Pradesh and on 1 day each in Nagaland-Manipur-Mizoram-Tripura, Telangana and coastal Karnataka. *Heavy rain* occurred on: 12 days in Kerala; 10 days in Orissa and coastal Andhra Pradesh, 7 days in coastal Karnataka, 6 days in Assam & Meghalaya, 4 days in Rayalaseema, Tamil Nadu and south interior Karnataka, 3 days in Arunachal Pradesh

and Kerala, 2 days in Jharkhand, Bihar, Vidarbha and Telangana and on 1 day each in Andaman & Nicobar Islands, Sub Himalayan West Bengal & Sikkim, Konkan & Goa, and north interior Karnataka.

Rain or thundershowers occurred either *at most places* or *at many places* on: 6 to 9 days in Tamil Nadu, coastal Karnataka; Kerala and Lakshadweep; 3 to 5 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Orissa, Rayalaseema, and south interior Karnataka and on 1 to 2 days in east Uttar Pradesh, Uttarakhand, coastal Andhra Pradesh and Telangana. It occurred at *a few places* on 14 days in Andaman & Nicobar Islands, 6 to 9 days in Nagaland-Manipur-Mizoram-Tripura, Orissa, coastal Andhra Pradesh, coastal Karnataka and Kerala; 3 to 5 days in Arunachal Pradesh, Assam & Meghalaya, Gangetic West Bengal, Jharkhand, Bihar, Konkan & Goa, Chattisgarh, Telangana, Rayalaseema and interior Karnataka, and on 1 to 2 days in Uttarakhand, Vidarbha, Tamil Nadu and Lakshadweep and at *isolated places* on: 19 days in Tamil Nadu; 18 days in Konkan & Goa; 10 to 13 days in Assam & Meghalaya, Himachal Pradesh, coastal Andhra Pradesh and south interior Karnataka, 5 to 9 days in Andaman & Nicobar Islands, Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Orissa, Bihar, east Uttar Pradesh, Uttarakhand, Madhya Maharashtra, Telangana, Rayalaseema, coastal & north interior Karnataka, Kerala and Lakshadweep; and on 1 to 4 days in Jharkhand, Haryana, Chandigarh & Delhi, Punjab, Marathwada, Vidarbha and Chattisgarh.

The *excess/normal* rainfall over the sub-divisions over northeast India may be attributed to the southwest monsoon rainfall occurred during the withdrawal phase in association with the low pressure area. That over the extreme and eastern parts of the south peninsula had been on account of the commencement of northeast monsoon and the subsequent formation of a deep depression over the Bay of Bengal as well as the cyclonic circulations persisted over the Bay of Bengal off the coasts of north Andhra – Orissa respectively.

3.1.5. *Temperature*

The dates on which the maximum temperature remained *appreciably to markedly above/below normal* and *above/below normal* are given in Table 6. The same date appearing in two different columns of a sub-division may be reckoned as occurrence of that category over parts of the sub-divisions. Maximum temperatures were normal for the rest of the days. There was no *heat wave* occurrence during the month.

The month's highest maximum temperature in the plains of the country was 39.0° C recorded at Barmer (west Rajasthan) and Jalgaon (Madhya Maharashtra) on 2 and 25 October respectively.

The dates of occurrence of *cold waves* and dates on which the minimum temperature remained *appreciably to markedly above/below normal* and *above/below normal* are given in Table 7. Minimum temperatures were normal for the rest of the days. *Cold wave* conditions prevailed on 1 day in interior Karnataka.

The month's lowest minimum temperature in the plains of the country was 11.0° C recorded at Khandwa (west Madhya Pradesh) on 30 October 2007.

3.1.6. *Disastrous weather events and associated damage*

According to media and other reports from various regions, apart from the havoc created by the Depression over the Bay of Bengal, heavy rain, lightning, thunder storm and hail storm took a toll of 41 lives in Andhra Pradesh, 15 in Karnataka, 10 in Tamil Nadu, 7 in Vidarbha, 5 in Assam and 1 each in West Bengal and Kerala. Thousands of houses were damaged and low lying areas were inundated with flood waters in various parts of the country. Crops over more than 9000 acres were damaged in Tamil Nadu, Karnataka and Andhra Pradesh.

3.2. *November*

3.2.1. *Storms and Depressions*

3.2.1.1. *Very Severe Cyclonic Storm (Sidr) over the Bay of Bengal (11 – 16 November 2007)*

Under the influence of an upper air cyclonic circulation, a low pressure area formed over the southeast Bay and adjoining Andaman Sea on 11. It rapidly concentrated into a Depression at 0900 UTC of 11 and lay centred near Lat. 10.0° N / Long. 92.0° E (about 200 km. southsouthwest of Port Blair). It remained practically stationary over there at 1200 UTC and intensified into a Deep Depression which lay centred near Lat. 10.5° N / Long. 91.5° E at 1800 UTC of 11. Moving slightly westwards, it further intensified into a Cyclonic storm (Sidr) and lay centred at 0300 UTC of 12, near Lat. 10.5° N / Long. 90.0° E. Subsequently it moved northwestward, intensified into a Severe cyclonic storm and lay centred at 1200 UTC of 12, near Lat. 11.5° N / Long. 90.0° E. It remained practically stationary and further intensified into a Very severe cyclonic storm at 1800 UTC of 12 and lay centred at 0300 UTC of 13, near Lat. 12.0° N / Long. 89.5° E. Subsequently, it moved northwards and lay

centred near Lat. 13.0° N / Long. 89.5° E at 1200 UTC of 13 and at 0300 UTC of 14, near Lat. 14.5° N / Long. 89.5° E. Continuing the northward movement, it lay centred at 0300 UTC of 15, near Lat. 18.0° N / Long. 89.0° E and at 1200 UTC, near Lat. 21.0° N / Long. 89.0° E (about 200 km. southsoutheast of Kolkata). Subsequently it began to re-curve northeastwards and crossed West Bengal – Bangladesh coast, near Long. 89.8° E around 1600 UTC of 15. Moving northnortheastwards, it rapidly weakened into a Cyclonic storm at 2100 UTC of 15 over Bangladesh and adjoining Tripura centred near Lat. 23.5° N / Long. 91.0° E. It continued to move northnortheastwards and further weakened rapidly into a Depression and lay centred at 0300 UTC of 16, near Lat. 24.5° N / Long. 91.5° E (about 50 kms north of Agartala). It further weakened into a low pressure area over there in the evening and became less marked in the morning of 17. The associated upper air cyclonic circulation became less marked on 20.

The system was mainly tracked by satellite. The maximum intensity of T 6.0 was reported by satellite imagery from 0300 to 2100 UTC of 15.

The system was also tracked by DWR Kolkata and CDR Paradeep. The DWR Kolkata tracked the system from 0500 UTC of 15th when 1st spiral band with semi circular 'EYE' appeared. Well-structured 'EYE' along with spiral bands appeared from 0700 UTC of 15.

The maximum estimated surface mean wind speed was 200 kmph. The lowest Estimated Central Pressure (ECP) was 944 hPa at 1200 UTC of 15. The system moved with an average speed of 22 kmph.

Widespread rainfall activity with heavy to very heavy falls occurred in Andaman & Nicobar Islands from 10 to 12 and in Assam & Meghalaya and Nagaland-Manipur-Mizoram-Tripura on 16.

The chief amounts of rainfall in cms are:

Andaman & Nicobar Islands

10 Nov 2007	Nancowry 7.
11 Nov 2007	Car Nicobar 18, Port Blair 11, Hut Bay 8.
12 Nov 2007	Long Islands 7.

Assam & Meghalaya

16 Nov 2007	Cherrapunji 15, Shillong 14.
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TABLE 8

Dates of occurrence of cold wave/severe cold wave and various categories of minimum temperatures - November 2007

No	Sub-division Name	Dates (Number of days)						
		Severe cold wave	Cold wave	Cold day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
2.	Arunachal Pradesh	Nil	Nil	Nil	Nil	Nil	2, 9, 11 (3)	15, 16, 20 (3)
3.	Assam & Meghalaya	Do	Do	Do	Do	29, 30 (2)	8, 9, 13, 14, 17, 22, 23, 28 (8)	1, 3, 4, 5, 6, 7, 10, 12, 13, 15, 16, 18, 19, 21, 22, 26 (16)
4.	Naga., Mani., Mizo and Tri.	Do	Do	Do	Do	Nil	2, 3, 4, 7, 11, 12, 14, 17, 18, 20, 22, 23, 28 (13)	8, 9, 10, 15, 16, 20, 21, 29, 30 (9)
5.	S. H. W. B. & Sikkim	Do	Do	Do	Do	Do	2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 16, 17, 18, 22, 23, 27, 28, 30 (18)	1, 13, 19, 20, 21, 29 (6)
6.	Gangetic West Bengal	Do	Do	Do	Do	Do	2, 3, 4, 5, 6, 7, 8, 9, 10, 17 (10)	1, 15, 16, 18, 28 (5)
7.	Orissa	Do	Do	Do	14 (1)	21, 22, 23, 25 (4)	1, 2, 3, 4, 5, 8, 9, 17, 18 (9)	6, 8, 10, 11, 12, 27, 30 (7)
8.	Jharkhand	Do	Do	Do	16 (1)	21, 22, 30 (3)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 17, 18, 28 (15)	15, 19 (2)
9.	Bihar	Do	Do	Do	Nil	23 (1)	1, 3, 5, 7, 8, 9, 10, 11, 12, 15, 17 (11)	4, 11, 16, 18, 20, 26 (6)
10.	East Uttar Pradesh	Do	Do	Do	Do	Nil	1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 25, 29 (14)	3, 5, 11, 13, 15, 22, 23, 24, 27, 28, 30 (11)
11.	West Uttar Pradesh	Do	Do	Do	Do	Do	2, 7, 8, 9, 11, 12, 13, 14, 17, 25, 30 (11)	3, 5, 11, 13, 15, 16, 22, 23, 24, 27, 28 (11)
12.	Uttarakhand	Do	Do	Do	9, 14 (2)	12 (1)	2, 6, 26 (3)	7, 8, 29 (3)
13.	Haryana, Chandigarh & Delhi	Do	Do	Do	4, 23, 24, 26, 27, 28 (6)	1, 2, 3, 4, 18, 20, 25 (7)	5, 8, 9, 11, 13, 18, 29, 30 (8)	7, 14, 17 (3)
14.	Punjab	Do	Do	Do	4, 26 (2)	1, 2, 3, 4, 18, 20, 21, 23, 25, 28 (10)	8, 14, 30 (3)	7, 9, 29 (3)
15.	Himachal Pradesh	Do	Do	Do	Nil	Nil	27, 28 (2)	16, 29 (2)
16.	Jammu & Kashmir	Do	28 (1)	Do	18, 22, 23, 24, 27, 28 (6)	2, 3, 11, 19, 20, 21, 29 (7)	Nil	Nil
17.	West Rajasthan	Do	Nil	Do	Nil	Nil	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30 (29)	1, 5, 24 (3)
18.	East Rajasthan	Do	Do	Do	Do	Do	2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30 (25)	5, 19, 22, 24 (4)
19.	West Madhya Pradesh	Do	21, 22, 25, 28 (4)	Do	21, 22, 23, 26, 28 (5)	20, 24 (2)	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 25, 30 (17)	6, 8, 11, 16, 18, 23, 26 (7)
20.	East Madhya Pradesh	Do	21 (1)	Do	21, 26, 28 (3)	5, 20, 24, 29 (4)	2, 3, 7, 8, 10, 11, 12, 13, 14, 15 (10)	4, 8, 16, 18, 19, 26 (6)
21.	Gujarat Region	Do	22, 23 (2)	Do	19, 22, 24, 27 (4)	20, 21, 25, 26 (4)	3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15 (12)	1, 8, 16, 24, 27 (5)
22.	Saurashtra & Kutch	Do	21 (1)	Do	10, 23, 24, 27 (4)	19, 21, 25, 28 (4)	3, 4, 5, 6, 7, 8, 11, 12, 13, 20, 28 (11)	1, 8, 14, 16, 17, 19, 24, 27 (8)
23.	Konkan & Goa	Do	26 (1)	Do	15, 16, 18, 22, 23, 24, 25, 27 (8)	14, 19, 27, 28 (4)	2, 3, 4, 6, 7, 12, 13 (7)	1, 5, 8, 9, 11, 13 (6)
24.	Madhya Maharashtra	Do	22, 23, 24, 25, 26 (5)	Do	16, 18, 19, 21, 22, 23, 24, 25, 26, 27 (10)	15, 17, 20, 21, 28 (5)	1, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 30 (12)	14 (1)
25.	Marathawada	Do	22, 25 (2)	Do	17, 24, 26 (3)	16, 17, 21 (3)	1, 2, 3, 4, 5, 6, 7, 9, 11, 12, 13, 14 (12)	8, 28 (2)

TABLE 8 (Contd.)

No	Sub-division Name	Dates (Number of days)						
		Severe cold wave	Cold wave	Cold day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
26.	Vidarbha	Nil	21, 22, 23, 25, 26, 27, 28, 29 (8)	Nil	17, 21, 23, 24, 25, 26, 28 (7)	15, 16, 17, 19, 20, 27, 29 (7)	1, 2, 3, 4, 5, 6, 7, 12, 13 (9)	6, 7, 8, 9, 11 (5)
27.	Chattisgarh	Do	Nil	Do	21, 22 (2)	6, 24, 30 (3)	1, 2, 4, 10 (4)	12 (1)
28.	Coastal Andhra Pradesh	Do	24 (1)	Do	14, 15, 16, 19, 22, 24, 29, 30 (8)	13, 23 (2)	1, 4, 5, 6, 12, 20, 27 (7)	3, 7, 8, 9, 11, 19, 20, 21, 28 (9)
29.	Telangana	Do	23, 25 (2)	Do	14, 16, 17, 22, 23, 24, 25, 26, 29, 30 (10)	15, 21, 27 (3)	1, 2, 3, 4, 5, 6, 19 (7)	7, 28 (2)
30.	Rayalaseema	26 (1)	23, 25 (2)	Do	10, 13, 14, 15, 16, 17, 18, 23, 24, 25, 26 (11)	8, 13 (2)	3 (1)	1, 5, 8, 19, 20, 28 (6)
31.	Tamil Nadu	Nil	26 (1)	25 (1)	14, 15, 16, 17, 25, 26, 30 (7)	1, 11, 21, 24 (4)	3, 4 (2)	1, 2, 6, 7, 8, 22, 23, 29, 30 (9)
32.	Coastal Karnataka	Nil	Nil	25 (1)	14, 15, 17, 18, 19, 24 (6)	27 (1)	6, 9 (2)	2, 3, 4, 5, 6, 9, 20, 30 (8)
33.	North interior Karnataka	26 (1)	23, 24, 25, 27 (4)		9, 10, 11, 13, 14, 15, 17, 22, 23, 24, 25, 26 (12)	11, 30 (2)	6, 12 (2)	2, 4, 6, 7 (4)
34.	South interior Karnataka	26 (1)	23, 24, 25, 27 (4)		8, 10, 11, 13, 14, 15, 17, 19, 22, 23, 24, 25, 26, 27 (14)	8, 11, 17, 27 (4)	6 (1)	2, 21 (2)
35.	Kerala	Nil	Nil	Nil	16, 17, 18, 26 (4)	7, 15, 27 (3)	6 (1)	2, 23 (2)

Nagaland-Manipur-Mizoram-Tripura

16 Nov 2007 Agartala 10, Sonamura 7.

One person died in West Bengal. Crops damaged in thousands hectares of land. Fourty six villages and thousands of people were affected. Some houses were partially / totally damaged in Mizoram. The Guwahati-Shillong road was also affected at several places. There was disruption of electricity supply in the costal belt due to breaking of dam of Bidyadhari river. Extensive areas were flooded near Gajikhali and Kheaghat.

3.2.2. Other synoptic features and associated weather

A summary of the synoptic systems for the month of November 2007 is given in Table 3. The sub-divisionwise percentage departure of rainfall and the significant amounts of rainfall during the month are given in Tables 1 and 5 respectively.

Northeast monsoon was *vigorous* on 1 day in Kerala and *active* on 1 day each in coastal Andhra Pradesh, Rayalaseema and Tamil Nadu

Very heavy rain occurred on 1 day each in Andaman & Nicobar Islands, Assam & Meghalaya. *Heavy rain* occurred on: 7 days in Tamil Nadu and on 1 to 3 days in Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, east Madhya Pradesh, Konkan & Goa, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Telangana, Rayalaseema, interior Karnataka and Lakshadweep.

Rain or thundershowers occurred either *at most places* or *at many places* on: 1 to 3 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Konkan & Goa, Madhya Maharashtra, Marathwada, Vidarbha, coastal Andhra Pradesh, Telangana, Rayalaseema, Tamil Nadu, coastal and south interior Karnataka and Kerala. It occurred *at a few places* on 4 to 5 days in Andaman & Nicobar Islands and Kerala and on 1 to 3 days in Arunachal Pradesh,

TABLE 9

Dates of occurrence of cold wave/severe cold wave and various categories of minimum temperatures - December 2007

No	Sub-division Name	Dates (Number of days)						
		Severe cold wave	Cold wave	Cold day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
2.	Arunachal Pradesh	Nil	Nil	Nil	Nil	6 (1)	Nil	2 (1)
3.	Assam & Meghalaya	Do	Do	Do	16, 22 (2)	7, 9, 10, 11, 12, 19, 20, 21, 23, 24, 25 (11)	2, 4, 6, 26, 28, 29, 30 (7)	1, 3, 8, 17, 25, 31 (6)
4.	Naga., Mani, Mizo. and Tripura	Do	Do	Do	Nil	20, 26 (2)	1, 2, 3, 4, 8, 9, 12, 14, 15, 16, 17, 18, 19, 28, 29 (15)	5, 7, 10, 11, 13, 17, 28, 30 (8)
5.	S. H. W. B. & Sikkim	Do	Do	Do	11, 18, 19, 20, 21, 23 (6)	9, 25, 30 (3)	1, 2, 3, 4, 7, 8, 26, 28 (8)	10, 12, 22, 29, 31 (5)
6.	Gangetic West Bengal	Do	Do	Do	31 (1)	21, 30 (2)	10, 15 (2)	2, 3, 14 (3)
7.	Orissa	Do	Do	Do	18, 19, 22, 24, 31 (5)	5, 6, 21, 23, 30 (5)	15, 28, 29 (3)	1, 3, 10, 12, 13, 14, 16, 22, 26, 27 (10)
8.	Jharkhand	31	19, 20, 21, 22 (4)	Do	10, 18, 23, 24, 29, 30, 31 (7)	1, 3, 4, 5, 6, 8, 11, 17, 25, 27 (10)	2, 15 (2)	14 (1)
9.	Bihar	Nil	18, 19, 20 (3)	Do	17, 18, 19, 29, 30, 31 (6)	6, 10, 11 (3)	15 (1)	3, 13, 14 (3)
10.	East Uttar Pradesh	Do	29, 31 (2)	Do	18, 19, 30, 31 (4)	5, 8, 16, 17, 20, 21, 27 (7)	2, 3, 4, 12, 13, 14, 22, 24, 26 (9)	7, 23, 25 (3)
11.	West Uttar Pradesh	Do	Nil	Do	17, 19, 30, 31 (4)	16, 28, 29 (3)	2, 3, 4, 12, 13, 22, 24, 25, 26 (9)	23 (1)
12.	Uttarakhand	Do	11 (1)	Do	3, 4, 12, 14, 15, 30 (6)	1, 13, 18, 20, 28, 29 (6)	23, 24 (2)	11, 21, 22, 26, 27, 28 (6)
13.	Haryana, Chandigarh & Delhi	19, 31 (2)	8, 16, 17, 18, 19, 20, 27, 28, 29, 30, 31 (11)	Do	5, 6, 8, 9, 16, 17, 27, 29, 30 (9)	15, 24, 28 (3)	1, 2, 4, 10, 11, 22, 23, 24, 25 (9)	12, 13, 14, 26 (4)
14.	Punjab	19, 31 (2)	17, 18, 19, 20, 29, 30, 31 (7)	Do	8, 9, 15, 16, 17, 21, 27, 28, 29 (9)	23, 24, 26 (3)	10, 11, 13, 22 (4)	7, 12 (2)
15.	Himachal Pradesh	Nil	10, 14 (2)	Do	1, 5, 12 (3)	9, 10, 13, 15 (4)	22, 23, 24 (3)	17, 21, 27, 29 (4)
16.	Jammu & Kashmir	31 (1)	14, 16, 17, 30, 31 (5)	Do	1, 16, 17, 22, 26, 29 (6)	3, 4, 5, 7, 19, 27, 28 (7)	10, 12, 20 (3)	1, 2, 11, 21 (4)
17.	West Rajasthan	Nil	16, 17, 28, 29, 30 (5)	Do	13, 16, 17, 18, 27 (5)	14, 15, 19, 31 (4)	1, 2, 5, 6, 7, 10, 11, 12, 21, 22, 23, 24, 25, 27 (14)	3, 4, 8, 9, 26, 27, 28 (7)
18.	East Rajasthan	31 (1)	9, 15, 16, 17, 28, 29, 30, 31 (8)	Do	14, 16, 18 (3)	9, 15, 17, 19, 26, 27 (6)	1, 2, 3, 5, 7, 10, 11, 12, 22, 23, 24, 25 (12)	4, 8, 26, 28 (4)
19.	West Madhya Pradesh	Nil	6, 9, 15, 16, 17 (5)	Do	5, 14, 15, 16, 18, 19, 22, 31 (8)	7, 8, 14, 17, 21, 30 (6)	1, 2, 3, 4, 10, 11, 12, 13, 14, 23, 24, 25, 26, 28, 29 (15)	17, 27, 29, 30 (4)
20.	East Madhya Pradesh	31 (1)	17, 19 (2)	Do	18, 19, 31 (3)	8, 17, 30 (3)	2, 3, 4, 7, 10, 12, 13, 14, 15, 16, 22, 23, 24, 25, 26, 28, 29 (17)	1, 5, 16, 17, 27, 29, 30 (7)
21.	Gujarat Region	Nil	Nil	Do	31 (1)	1, 10, 13, 14, 15, 16, 17, 30 (8)	2, 3, 4, 6, 11, 12, 17, 21, 22, 24, 25, 26, 27, 28 (14)	1, 5, 7, 10, 19, 20, 27, 28 (8)
22.	Saurashtra & Kutch	Do	15, 16, 30 (3)	31 (1)	4, 14, 16, 30, 31 (5)	1, 10, 13, 16, 28 (5)	2, 3, 5, 6, 7, 11, 12, 17, 18, 21, 22, 23, 24, 25, 26, 27 (16)	1, 3, 8, 10, 19, 20, 27 (7)
23.	Konkan & Goa	Do	Nil	Nil	26 (1)	4, 13, 25, 29, 30 (5)	6, 20, 21, 22, 24 (5)	5, 7, 18, 23, 26, 27 (6)
24.	Madhya Maharashtra	Do	Do	Do	25 (1)	7, 8, 18, 30 (4)	4, 5, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22, 23, 24, 25, 27, 28, 31 (19)	1, 3, 6, 7, 18, 19, 26, 27, 29, 30 (10)

TABLE 9 (Contd.)

Sub-division		Dates (Number of days)						
No	Name	Severe cold wave	Cold wave	Cold day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
25.	Marathwada	Nil	Nil	Nil	7 (1)	8, 9 (2)	3, 4, 5, 10, 11, 12, 14, 15, 16, 17, 18, 20, 21, 22, 24, 25, 27, 28, 30, 31 (20)	1, 12, 26, 27 (4)
26.	Vidarbha	Do	Do	Do	6, 7, 8, 19 (4)	2, 6, 9, 23 (4)	13, 15, 20, 21, 22, 24, 27, 28, 29, 30, 31 (11)	3, 6, 14, 16, 17, 26, 27 (7)
27.	Chattisgarh	Do	18 (1)	Do	18, 19, 31 (3)	1 (1)	12, 13, 15, 26, 27, 28, 29 (7)	14, 16, 17, 27, 30 (5)
28.	Coastal Andhra Pradesh	Do	Nil	25 (1)	24 (1)	23 (1)	12, 14, 15, 16, 17, 18, 19, 20, 29, 30, 31 (11)	1, 2, 3, 4, 5, 9, 10, 11, 13, 20, 27, 28 (12)
29.	Telangana	Do	Do	Nil	Nil	6, 12 (2)	2, 3, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 31 (17)	3, 4, 5, 6, 9, 11, 13, 27 (8)
30.	Rayalaseema	Do	25 (1)	Do	2, 11, 24, 26, 27 (5)	9, 28 (2)	5, 15, 16, 17, 19, 20, 30, 31 (8)	4, 6, 8, 10, 13, 14, 17, 22, 23 (9)
31.	Tamil Nadu	Do	Nil	Do	25, 26, 27 (3)	1, 11, 25, 26, 30 (5)	5, 7, 19, 21, 22, 24 (6)	3, 4, 9, 13, 16, 18, 20, 21, 31 (9)
32.	Coastal Karnataka	Do	Do	25 (1)	26, 27 (2)	25, 28 (2)	4, 6, 15, 17, 20, 21, 24 (7)	5, 7, 11, 14, 16, 18, 19, 23, 29, 30, 31 (11)
33.	North interior Karnataka	Do	Do	Nil	23, 24, 25 (3)	1, 7, 12, 25, 27 (5)	15, 19, 20, 29, 30 (5)	11, 16, 22, 30, 31 (5)
34.	South interior Karnataka	Do	24, 25 (2)	Do	2, 3, 4, 5, 6, 23, 25, 26, 28 (9)	1, 7, 12, 14, 27 (5)	15, 18, 19, 20, 21, 30 (6)	11, 16, 22, 30 (4)
35.	Kerala	Do	Nil	Do	27 (1)	1, 15 (2)	21 (1)	18, 22 (2)

Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, Punjab, Konkan & Goa, Madhya Maharashtra, Marathwada, Rayalaseema, Tamil Nadu, coastal and north interior Karnataka and Lakshadweep and at isolated places on: 13 to 14 days in Andaman & Nicobar Islands, Tamil Nadu and Kerala; 8 to 11 days in Assam & Meghalaya, coastal Andhra Pradesh, Rayalaseema and south interior Karnataka; 4 to 6 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Orissa, Gujarat region, Madhya Maharashtra, coastal & north interior Karnataka and Lakshadweep and on 1 to 3 days in West Bengal & Sikkim, Jharkhand, Haryana, Chandigarh & Delhi, Jammu & Kashmir, Madhya Pradesh, Saurashtra & Kutch, Konkan & Goa, Marathwada, Vidarbha, Chattisgarh and Telangana.

The Very Severe Cyclonic Storm (Sidr) adversely affected the rainfall over the northeast monsoon regime. However, the sub-divisions which received *excess / normal* rainfall, viz., Andaman & Nicobar Islands, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura and Gangetic West Bengal could be attributed to the formation and movement of this cyclonic storm (other than Konkan & Goa).

3.2.3. Temperature

It is evident from Table 8 that, *Severe Cold Wave conditions* prevailed on 1 day each in Rayalaseema and interior Karnataka. *Cold wave conditions* prevailed on 8 days in Vidarbha, 4 to 5 days in west Madhya Pradesh, Madhya Maharashtra and interior Karnataka and on 1 to 2 days in Jammu & Kashmir, east Madhya Pradesh, Gujarat State, Konkan & Goa, Marathwada, coastal Andhra Pradesh, Telangana, Rayalaseema and Tamil Nadu.

Month's lowest minimum temperature over the plains of the country was 5.0° C recorded at Amritsar (Punjab) on 21, 25 and 27 November 2007.

3.2.4. Disastrous weather events and associated damage

According to media reports, heavy rain and lightning took a toll of 8 lives in Tamil Nadu, 5 in Vidarbha and 4 in Kerala. In Kerala, extensive damage to agriculture, flooding in low lying areas, damage to electrical lines and electrical equipments were reported. Seventeen houses

were damaged in Mizoram due to the remnant of the Very Severe Cyclonic Storm (Sidr).

3.3. December

3.3.1. Storms and depressions

During the month, there was no Cyclonic Storm or Depression formed over the Bay of Bengal and the Arabian Sea.

3.3.2. Weather and associated synoptic features

Table 4 gives the summary of synoptic systems during the month of December 2007. The sub-divisionwise percentage departure of rainfall and the significant amounts of rainfall during the month are given in Tables 1 and 5 respectively.

Northeast monsoon was *vigorous* on 4 days in Tamil Nadu and on 1 day in Rayalaseema.

Extremely heavy rain occurred on: 1 day in Tamil Nadu; *Very heavy rain* occurred on 2 days each in Tamil Nadu and on 1 day each in Rayalaseema and Lakshadweep and *heavy rain* occurred on 3 days in Tamil Nadu and on 1 day each in Andaman & Nicobar Islands, Rayalaseema and south interior Karnataka.

Rain or thundershowers occurred either *at most places* or *at many places* on: 1 to 3 days in Andaman & Nicobar Islands, Uttarakhand, Himachal Pradesh, Jammu & Kashmir, Rayalaseema, Tamil Nadu and Kerala. It occurred at *a few places* on 4 days in Himachal Pradesh and on 1 to 3 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Punjab, east Rajasthan, Rayalaseema, Tamil Nadu and south interior Karnataka. and at *isolated places* on: 16 days in Tamil Nadu; 6 to 8 days in coastal Andhra Pradesh, Rayalaseema, and Kerala and on 1 to 4 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Sub Himalayan West Bengal & Sikkim, Bihar, east Uttar Pradesh, Haryana, Chandigarh & Delhi, Punjab, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Karnataka and Lakshadweep.

Western disturbances gave rise to precipitation over northwest India. However, the amounts of precipitation were meager. Also, a low pressure area and troughs in easterlies caused the *excess* rainfall over the sub-divisions viz., Rayalaseema and Tamil Nadu.

3.3.3. Temperature

It is evident from Table 9 that, *Severe cold wave conditions* prevailed on 1 to 2 days in Jharkhand, Haryana, Chandigarh & Delhi, Punjab, Jammu & Kashmir, east Rajasthan and east Madhya Pradesh. *Cold day* conditions prevailed on 11 days in Haryana, Chandigarh & Delhi, 8 days in east Rajasthan, 3 to 5 days in Jharkhand, Bihar, Jammu & Kashmir, west Rajasthan and west Madhya Pradesh and on 1 to 2 days in east Uttar Pradesh, Uttarakhand, Himachal Pradesh, east Madhya Pradesh, Chattisgarh, Rayalaseema and south interior Karnataka.

The month's and season's lowest minimum temperature in the plains of the country was 1.0° C recorded at Amritsar and Pilani on 27 & 28 December 2007 respectively.

3.3.4. Disastrous weather events and associated damage

According to media reports, cold wave took a toll of 23 lives in Bihar and 17 in Jharkhand. Seventy-three persons died due to heavy rain in Tamil Nadu. Paddy crops over 4 hectares were submerged in water and 417 houses were reported to be damaged.

Appendix

Definitions of the terms given in '*Italics*'

Rainfall

<i>Excess</i>	- percentage departure from normal is + 20% or more.
<i>Normal</i>	- percentage departure from normal is -19 % to + 19 %.
<i>Deficient</i>	- percentage departure from normal is -20 % to -59 %.
<i>Scanty</i>	- percentage departure from normal is -60 % to -99 %.
<i>Heavy rain</i>	- rainfall amount from 6.5 cm to 12.4 cm.
<i>Very heavy rainfall</i>	- rainfall amount 12.5 cm to 24.4 cm.
<i>Extremely heavy rain</i>	- rainfall amount 24.5 cms and above.
<i>At most places</i>	- 76 % or more stations of a meteorological sub-division reporting at least 2.5 mm rainfall.
<i>At many places</i>	- 51% to 75 % stations of a meteorological sub-division reporting at least 2.5 mm rainfall.

At a few places - 26 % to 50% stations of a meteorological sub-division reporting at least 2.5 mm rainfall.

At isolated places - 25% or less stations of a meteorological sub-division reporting at least 2.5 mm rainfall.

Monsoon activity

(a) Southwest monsoon

Vigorous - rainfall exceeding 4 times the normal with, at least two stations reporting rainfall more than or equal to 8 cm along the west coast and 5 cm elsewhere. Rainfall in that sub-division should be fairly widespread or widespread.

Active - rainfall more than 1½ to 4 times the normal, with at least two stations reporting rainfall more than or equal to 5 cm along the west coast and 3 cm elsewhere. Rainfall in that sub-division should be fairly widespread or widespread.

(b) Northeast monsoon

Vigorous - rainfall exceeding 4 times the normal with at least two stations reporting rainfall more than or equal to 5 cm in coastal Tamil Nadu and south coastal Andhra Pradesh and 3 cm elsewhere in the northeast monsoon region. Rainfall in that sub-division should be fairly widespread or widespread.

Active - rainfall more than 1½ to 4 times the normal, with at least two stations reporting rainfall more than or equal to 3 cm in coastal Tamil Nadu and south coastal Andhra Pradesh and 2 cm elsewhere in the northeast monsoon region. Rainfall in that sub-division should be fairly widespread or widespread.

Temperatures

(a) Maximum / Day temperature

According to the revised criteria, since 1 March 2002, Heat Wave will be declared only when the maximum temperature of a station reaches at least 40° C for plains and at least 30° C for Hilly regions.

Severe heat wave conditions - Departure of maximum temperature from normal is +6° C or more for the regions where the normal maximum temperature is more than 40° C and +7° C or more for regions where the normal maximum temperature is 40° C or less.

Heat wave conditions - + 4° C to + 5° C for the regions where the normal maximum temperature is more than 40° C and departure of maximum temperature from normal is + 5° C to + 6° C for regions where the normal maximum temperature is 40° C or less. (declared only when the maximum temperature of a station reaches at least 40° C for Plains and at least 30° C for Hilly region)

Markedly above normal - departure from normal is +5° C to +6° C (where the normal maximum temperature is 40° C or less).

Appreciably above normal - departure from normal is +3° C to +4° C (where the normal maximum temperature is 40° C or less).

Above normal - departure from normal is +2° C.

Normal - departure from normal is +1° C to -1° C.

(b) Minimum / Night temperature

Severe cold wave conditions - departure of WCT_n from normal minimum temperature is -7° C or less for the regions where normal minimum temperature is $\geq 10^\circ C$ and -6° C or less elsewhere

Cold wave conditions when the wind chill effective minimum temperature (WCT_n) is 10° C or less: For stations whose normal minimum temperature is $\geq 10^\circ C$, when the departure from normal is -5° to -6° C, and for stations whose normal minimum temperature is less than 10° C when the departure from normal is -4° to -5° C. Also when WCT_n is $\leq 0^\circ C$, cold wave is declared irrespective of the departure for those stations whose normal minimum temperature is greater than 0° C.

<i>Cold day conditions</i>	For inland plain stations, when the day temperature is less than or equal to 16° C.	<i>Appreciably below normal</i>	- departure from normal is between -3° C to -4° C (where the normal minimum temperature is 10° C or more).
<i>Markedly below normal</i>	- departure from normal is -5° C to -6° C (where the normal minimum temperature is 10° C or more).	<i>Below normal</i>	- departure from normal is -2° C.
		<i>Normal</i>	- departure from normal is +1° C to -1° C.

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		(No. of days)				
		Vigorous	Active	Extr. Heavy	V. Heavy	Heavy
Total	Read	124	352	15	148	769
Total	For	139	124	352	15	148