

Weather

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POST MONSOON SEASON (OCTOBER-DECEMBER 1984)*

1. Chief features

(i) Withdrawal of southwest monsoon from the country on 3 October and onset of northeast monsoon over Tamil Nadu on 5 October.

(ii) During this season three severe cyclonic storms formed in the Bay of Bengal and one depression in the Arabian Sea

(iii) Mainly dry weather prevailed over northwest India outside Jammu & Kashmir during the season. Dry weather also prevailed over West Bengal & Sikkim, Orissa, Bihar State, Madhya Pradesh and Gujarat State during November and December.

(iv) During the season rainfall was in large excess in Arunachal Pradesh; moderate excess in Andaman & Nicobar Islands, Madhya Maharashtra, Marathwada and coastal Karnataka; normal in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim and Telangana & Lakshadweep. It was slightly deficient in Gangetic West Bengal, Vidarbha and north Interior Karnataka; moderately deficient in Nagaland, Manipur, Mizoram & Tripura, Jammu & Kashmir, Konkan & Goa, coastal Andhra Pradesh, Rayalaseema, Tamil Nadu and Kerala and largely deficient in the rest of the country (Fig. 1).

2. October

2.1. Withdrawal of southwest monsoon from the country and setting in of northeast monsoon

On 3 October southwest monsoon withdrew from the country outside Tamil Nadu and Kerala. On 5 October northeast monsoon set in over Tamil Nadu.

2.2. Cyclonic storm

During this month one severe cyclonic storm developed in the Bay. Under the influence of a cyclonic circulation in the lower tropospheric levels a low pressure area formed over southeast Bay and adjoining Andaman Sea on 9th. Another low pressure area lay over west central and adjoining southwest Bay off Andhra-north Tamil Nadu coast on 6th. Both these systems merged together over central and adjoining northwest Bay on 11th, where it concentrated into a depression in the forenoon of 12th and lay centred at 1200 GMT near 18.5 deg. N, 89.5 deg. E. Moving northwestwards it rapidly intensified into a severe cyclonic storm over

northwest Bay by 13th morning and into a severe cyclonic storm with core of hurricane winds by evening. Weakening into a severe cyclonic storm it crossed north Orissa coast near Chandbali in the forenoon of 14th and further weakened into a well marked low pressure area over Bihar Plateau and neighbourhood by 15th evening (Fig. 2). It became unimportant over Bihar plains and adjoining east Uttar Pradesh on 18th. Under the influence of this system rain or thunder-showers were generally widespread on 1 to 3 days over northeast India and east Uttar Pradesh. Isolated heavy falls occurred in some of the sub-divisions. The significant amounts of rainfall (cm) were: Cooch Behar 8 on 12th; Sandheads 38 on 13th; Chandbali 17, Daitari 11, Paradeep 8 on 14th; Anandpur 16, Bont 14, Akhuapada 10, Darjeeling and Ranchi AP 7 each on 15th.

The system caused some damage in Cuttack and Balasore districts of Orissa and Midnapore district of West Bengal. In Balasore and Cuttack district snapped telephone and power lines and in Midnapore district blew off 500 huts.

2.3. Other systems

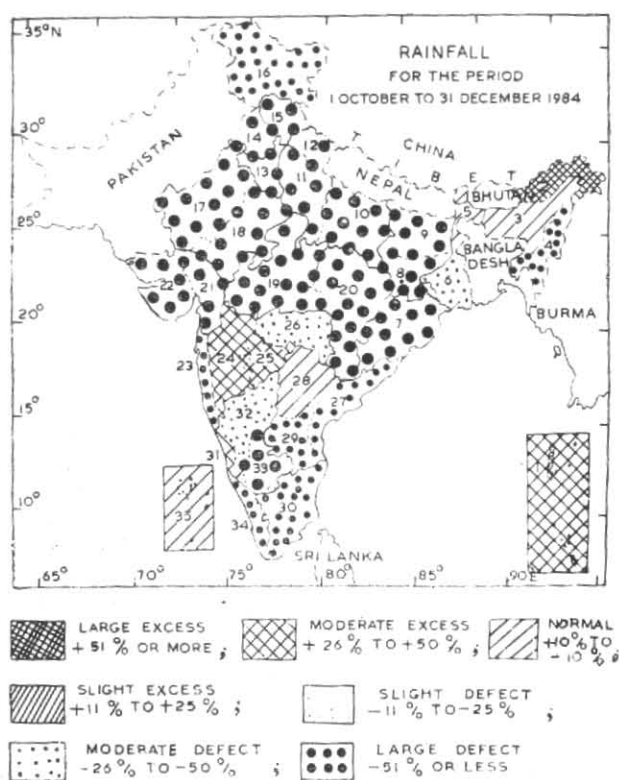
The following other systems affected the country during the month:

2.3.1. Systems in easterlies

(i) A cyclonic circulation extending upto mid-tropospheric levels emerged from the east into east central and adjoining northeast Bay on 1st. Under its influence there developed a low pressure area on 2nd. Moving northwestwards it lay over Sub-Himalayan West Bengal and adjoining areas on 5th. Thereafter it moved eastwards and became less marked over Assam and Meghalaya by the evening of 7th.

(ii) The well marked low pressure area which lay over southwest and adjoining west central Bay on the last day of September, moved across Peninsula and lay over Lakshadweep and adjoining sea areas on 2nd. It became a low pressure area there on 4th and persisted till 7th. Thereafter, it moved slowly northwards over east central Arabian Sea off Maharashtra coast by 10th, where it became less marked by 11th evening. Another low pressure area, which lay over southwest Bay of Tamil Nadu coast on 2nd, moved across the Peninsula and merged with the above system on 5th.

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<i>Sub-div.</i>	<i>Dep. from normal</i>	<i>Sub-div.</i>	<i>Dep. from normal</i>
(1) A. N. Islands	34	(18) East Rajasthan	-99
(2) Arunachal Pradesh	82	(19) West M.P.	-80
(3) Assam & Megha	1	(20) East M.P.	-65
(4) N. M. M. & T.	-45	(21) Gujarat Reg.	-95
(5) S. H. W. B. Sikkim	0	(22) S & K	-99
(6) G. West Bengal	-15	(23) Konkan & Goa	-48
(7) Orissa	-63	(24) Madhya Maharashtra	27
(8) Bihar plateau	-57	(25) Marathwada	41
(9) Bihar plains	-76	(26) Vidarbha	-17
(10) East U.P.	-73	(27) Coastal A.P.	-35
(11) Plains W.U.P.	-97	(28) Telangana	-10
(12) Hills W.U.P.	-92	(29) Rayalaseema	-41
(13) Haryana	-95	(30) Tamil Nadu	-32
(14) Punjab	-80	(31) Cot. Karnataka	47
(15) Himachal Pradesh	-60	(32) N. I. Karnataka	-18
(16) Jammu & Kashmir	-26	(33) S. I. Karnataka	-53
(17) West Rajasthan	-97	(34) Kerala	-36
		(35) Lakshadweep	6

Fig. 1

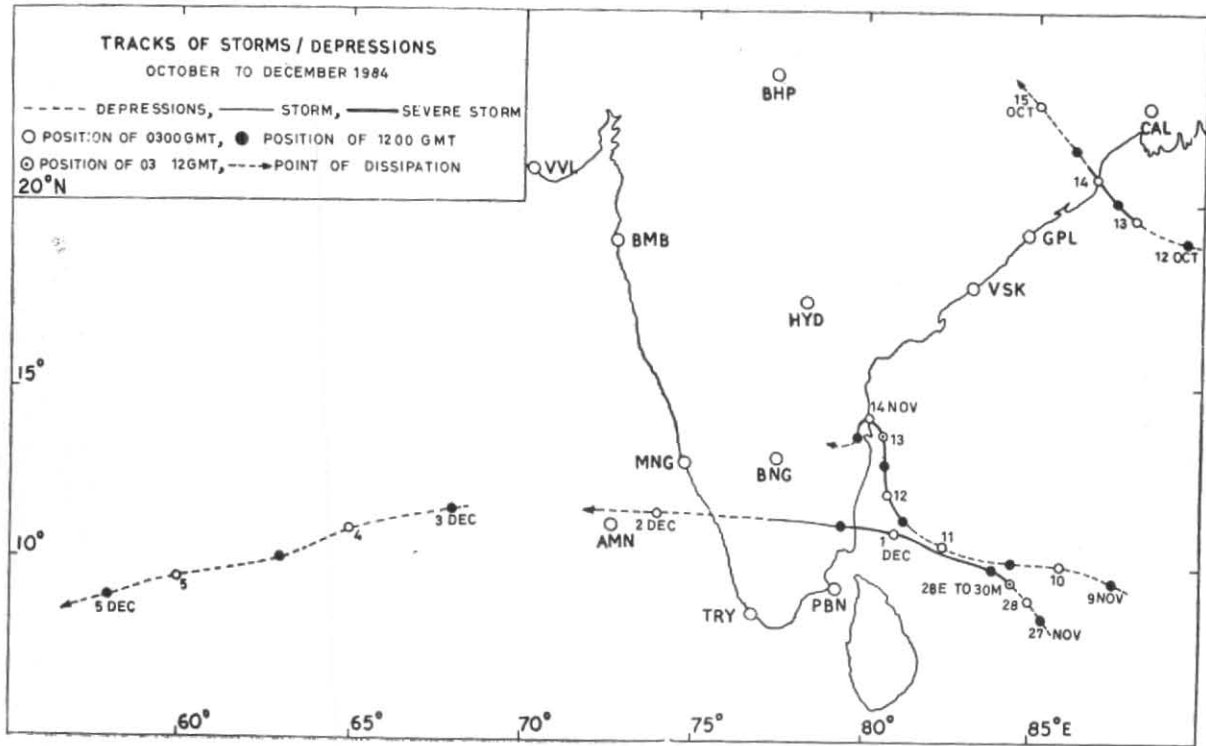


Fig. 2

(iii) A cyclonic circulation in the lower/middle tropospheric levels was observed over Lakshadweep and neighbourhood from 16th to 20th. It became unimportant over east central Arabian Sea off Karnataka-Goa-south Maharashtra coasts on 24th.

(iv) A low pressure area, which lay over southeast Madhya Pradesh and neighbourhood on 19th, became less marked by next day. The associated cyclonic circulation extending upto lower tropospheric levels moved over Madhya Maharashtra and neighbourhood on 23rd where it became less marked on 26th.

(v) A cyclonic circulation in the lower troposphere lay over interior Tamil Nadu and adjoining Kerala on 19th evening. It became less marked there on 21st.

(vi) Another cyclonic circulation in the lower troposphere moved from southwest Bay to Lakshadweep area across south Peninsula between 26th and 29th. It became less marked there by evening of 29th.

2.3.2. Systems in westerlies

(i) The western disturbance of the previous month and six others moved away eastwards across Western Himalayas and neighbourhood.

(ii) A cyclonic circulation between 1.5 and 3.1 km asl lay over Rajasthan and adjoining areas on 3rd. It became less marked over hills of west Uttar Pradesh and adjoining Himachal Pradesh on 6th.

(iii) Another cyclonic circulation extending upto 3.6 km asl lay over Vidarbha and neighbourhood on 11th. It became unimportant over southeast Madhya Pradesh and neighbourhood on 13th.

(iv) Two troughs in the lower troposphere were seen to move from West Bengal and Sikkim to Assam and neighbourhood, one between 22nd and 26th and the other between 28th and 31st.

The western disturbances caused little precipitation over Western Himalayas. Rain or thundershowers were generally widespread on 7 to 10 days in Andaman & Nicobar Islands, Arunachal Pradesh, coastal & north interior Karnataka; on 3 to 6 days in Assam & Meghalaya, interior Maharashtra, coastal Andhra Pradesh, Telangana, south interior Karnataka and Lakshadweep and on 1 or 2 days in Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Bihar Plateau, Konkan & Goa and Rayalaseema during the month with isolated heavy to very heavy falls on a couple of days in some of these sub-divisions. North-east monsoon was active to vigorous on 5 days in Tamil Nadu and Kerala.

The weather over west Uttar Pradesh and north-west India was practically dry except for isolated rainfall in Haryana on 3rd, in Himachal Pradesh on 15th and 30th. Gujarat region received isolated or scattered rainfall on 3 days and Madhya Pradesh on 7 to 10 days.

2.3.3. Rainfall during the month

Rainfall during the month was excess in Arunachal Pradesh, Madhya Maharashtra, Marathwada, Karnataka and Lakshadweep; normal in Andaman & Nicobar Islands, Assam & Meghalaya, West Bengal & Sikkim, Vidarbha and Telangana; deficient in Nagaland, Manipur, Mizoram & Tripura, Orissa, Bihar Plateau, east Madhya Pradesh, Konkan & Goa, coastal Andhra Pradesh, Rayalaseema and Kerala. It was scanty over the rest of the country outside east Rajasthan where there was no rainfall.

The significant amounts (cm) of rainfall were :

- 1st : Adirampattinam 15, Trichur & Vedaranyam 10 each, Mercara 8.
 2nd : Kunigal 15, Amini Divi 14, Thanjavur 13, Siddapur 10, Mercara & Krishnarajpet 9 each.
 3rd : Mercara 11, Punalur 10, Amini & Coimbatore AP 7 each.
 4th : Amini 13, Malda 12, Gobichettipalayam 10 Coimbatore 9, Chaparmukh 8.
 5th : Kandukur & Puttur 9 each, Tezu 7.
 6th : Lingadahalli 16, Jagalur & Ramdurg 7 each
 7th : Malegaon & Sholapur 9 each.
 8th : Kasargode 13, Alur & Pune 8 each, Kozhikode & Cannanore 7 each.
 9th : Nancowry & Kozhikode 13 each, Karwar 12, Sollurpet, Sandur 10 each, Tiruttani 9, Panjim & Agumbe 8 each.
 10th : Akola AP 12, Udaygiri 11, Bantwal & Udupi 9 each, Belthangadi 8.
 11th : Honaver 17, Parkal 12, Goa (Dabolim) 11, Long Island 9.
 12th : Honaver 17, Kumta 10, Sorapur 9, Maya Bandar & Jaggayyapet 8 each.
 13th : Sandheads 38.
 14th : Paradip 8, Yellapur 7.
 15th : Port Blair 11, Darjeeling, Ranchi AP 7.
 16th : Nancowry 8.
 19th : Jalpaiguri 8.
 21st : Jalpaiguri 17, Sandheads 12, Tadong 11.
 24th : Chikodi & Kushtagi 11 each, Bijapur 7.
 25th : Hunsur 9, Polavaram 8.
 26th : Sivaganga 7.
 27th : Parli 11, Tondi & Dindigul 8 each, Srivilliputtur & Palghat 7 each.
 28th : Cannanore 7.

2.3.4. Temperature

Day temperatures were below to appreciably below normal on 3 to 5 days in Tamil Nadu, Karnataka and Kerala during first and second week and in Gangetic West Bengal, Bihar Plateau and interior Maharashtra during second and third week. Over the rest of the country they were generally above normal.

Night temperatures were generally below to appreciably below normal in Rajasthan during the month. They were so in Uttar Pradesh and rest of northwest India during the first fortnight. Below to appreciably below normal night temperatures were also recorded on 5 to 7 days in Gujarat State, Vidarbha, coastal Andhra Pradesh, Telangana, Tamil Nadu and Kerala during second and third week of the month.

3. November

Two cyclonic storms developed in the Bay of Bengal during this month. One of them attained hurricane strength and the other was over the sea on the last day of the month.

3.1. Cyclonic storms

(i) A well marked low pressure area developed over southeast Bay on 9th morning which rapidly concentrated into a deep depression over the same area by evening of 9th. Moving westnorthwest to northwestwards it intensified over southwest Bay into a cyclonic storm with core of hurricane winds on 12th morning. Thereafter, it slowly moved northward remained practically stationary for 24 hours between 13th morning and 14th morning near Sriharikota and crossed south Andhra coast north of Sriharikota around mid-day of 14th (Fig. 2). It took a southwesterly course and weakened over north Tamil Nadu and adjoining south Andhra on 15th. It became unimportant by next day.

Under its influence heavy to very heavy rainfall occurred over coastal areas of north Tamil Nadu and south Andhra Pradesh. Significant amounts (cm) of rainfall were :

Madras AP 11, Kancheepuram 9 on 12th; Madras city 25, Rapur 12, Kaveli, Sullurpet & Rajampet 10 each, Kancheepuram 9, Nellore & Tirupati AP 7 each on 13th; Nellore 16, Tirupati AP 8 on 14th; Nellore 19, Rapur 16, Tirupati AP 15, on 15th and Rapur 23, K. Paramathy 11, Vellore 7 on 16th.

As per press reports the death toll in Chittoor and Nellore districts of Andhra Pradesh was about 470 and that in Tamil Nadu was 54. Livestock perished in Nellore district was about 55227. There was considerable damage to crops and property in the above two districts of Andhra Pradesh.

(ii) Within the trough of low over southwest Bay, which was existing since 24th, a well marked low pressure area developed there by the morning of 27th. It concentrated into a depression in the same evening centred at 1200 GMT near 8.5 deg. N, 85.5 deg. E. Moving westnorthwestwards it intensified into a cyclonic storm on 29th and into a severe cyclonic storm on 30th over southwest Bay. It lay on 30th evening centred near 10.0 deg. N, 84.0 deg. E.

3.2. Other systems

3.2.1. Systems easterlies

The following other systems in easterlies were observed during the month :

(i) A cyclonic circulation in the lower and middle troposphere moved from southwest Bay to Maldives-Lakshadweep area between 1st and 4th. It became less marked there on 6th.

(ii) A cyclonic circulation in the lower levels moved from southwest Bay to extreme south Peninsula and adjoining Comorin area between 3rd and 5th and became less marked there on 6th.

(iii) A cyclonic circulation extending upto middle troposphere lay over Lakshadweep and neighbourhood on 13th. Under its influence a low pressure area developed over southeast and adjoining east central Arabian Sea off Kerala-Karnataka coasts on 17th. Slowly moving westwards it became unimportant over southeast Arabian Sea, west of Lakshadweep on 23rd.

3.2.2. Systems in westerlies

(i) Seven western disturbances moved away across north Pakistan, Western Himalayas and neighbourhood during the month. The eighth western disturbance of the month lay over Jammu & Kashmir and neighbourhood on 30th.

(ii) A trough in middle and upper tropospheric westerlies, which lay over north Pakistan on 4th, moved across northwest India and adjoining west Uttar Pradesh and western Tibet and became less marked over eastern Tibet on 6th.

The weather during the month was mainly dry over the country north of 15 deg. N outside Jammu & Kashmir, Assam & Meghalaya and coastal Andhra Pradesh. Jammu & Kashmir received the first snowfall of the season on 22nd/23rd.

Northeast monsoon was active on 5 days in Tamil Nadu. Rain or thundershowers were generally widespread on 8 days in Andaman & Nicobar Islands, on 2 to 3 days in Jammu & Kashmir, coastal Andhra Pradesh, Rayalaseema, Kerala and Lakshadweep and so on 23rd in Himachal Pradesh. Scattered or isolated rainfall occurred on 2 to 5 days in Assam & Meghalaya, Madhya Maharashtra and coastal Karnataka and that on 17 to 19 days in Tamil Nadu and Kerala, on 6 to 10 days in coastal Andhra Pradesh, Rayalaseema and south interior Karnataka.

3.2.2. Systems in westerlies

It was excess in Jammu & Kashmir and Lakshadweep; normal in coastal Andhra Pradesh, deficient in Andaman & Nicobar Islands, east Uttar Pradesh, Himachal Pradesh, Rayalaseema, Tamil Nadu and Kerala and scanty in Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, plains of west Uttar Pradesh, Punjab, west Rajasthan, Konkan & Goa, Madhya Maharashtra, Vidarbha, Telangana and Karnataka. There was no rainfall in the rest of the country.

The significant amounts (cm) of rainfall were :

- 2nd : Amalapuram 8.
- 3rd : Visakhapatnam 6, Koderu 5.
- 4th : Kandukur, 10, Kavali 6, Ongole & Nagapattinam 5 each.
- 5th : Udayagiri 6, Atmakur 5.
- 6th : Parangipettai 7, Satyamangalam 5.
- 7th : Vedaranyam 9, Nancowry 5.
- 8th : Parangipettai 10, Nagapattinam 7.
- 10th : Nagapattinam 7.

11th : Minicoy 8, Vedaranyam 6, Nagapattinam & Karaikal 5 each

17th : Nellore 8, Parangipettai 7, Madras AP 6.

18th : Vadaranuam 7.

20th : Pamban 13, Kozhikode 12.

25th : Karaikal 11, Pondicherry 7, Car Nicobar, Kakinada, Cuddalore, Vedaranuam & Kumbakonam 5 each.

26th : Car Nicobar 5.

3.2.4. Temperature

Night temperatures during the month were generally below normal being appreciably so on a couple of days in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Orissa and Himachal Pradesh. They were generally below to appreciably below normal in Bihar, plains of Uttar Pradesh and in northwest India during the first fortnight and so in Gujarat State, interior Maharashtra, coastal Andhra Pradesh, Telangana and north interior Karnataka during the second fortnight of the month. Appreciably above normal night temperatures were recorded on a couple of days in Marathwada in the first week of the month.

4. December

The severe cyclonic storm, which lay over southwest Bay on the last day of November affected south Peninsula and neighbourhood during the first week. During the same week a deep depression formed over southeast Arabian Sea.

4.1. Storms and depressions

(i) The severe cyclonic storm, which lay over southwest Bay in the evening of 30 November further intensified into a severe cyclonic storm with a core of hurricane winds on 1st morning, moved rapidly westnorthwestwards and crossed Tamil Nadu coast in the afternoon near Karaikal. It rapidly weakened and emerged as a depression in southeast and adjoining east central Arabian Sea on 2nd morning and weakened there to a well marked low pressure area by the same evening (Fig. 2). Under its influence northeast monsoon was vigorous over Tamil Nadu on 2nd and rain or thundershowers were generally widespread in Rayalaseema and Kerala on 2nd and so in Lakshadweep on 3rd. The significant amounts (cm) of rainfall were:

Nagapattinam & Vedaranyam 4 each on 1st; Kodaikanal & Uthagamandalar 15 each, Coonoor, Sivaganga & Vedaranyam 9 each, Nagapattinam, Namakkal & Vellore 7 each, Satyamangalam 6 on 2nd; Amini Divi 5, Coonoor & Kodaikanal 4 each on 3rd.

According to press reports about 35,000 people were affected in east Thanjavur and south Arcot districts of Tamil Nadu. Standing crops in about 50,000 acres of land was submerged in Thanjavur district. Two villages were reported to have been monsoon.

(ii) The remnant of the above severe cyclonic storm which was a well marked low pressure area over southeast and adjoining east central Arabian Sea re-intensified into a deep depression on 3rd evening and lay centred at 1200 GMT near 11.5 deg. N, 68.0 deg. E. It moved westsouthwestwards and weakened into a well marked low pressure area over southwest Arabian Sea by the night of 5th. By 6th evening it became unimportant. The system did not cause any significant weather over the country.

4.2. Other systems

4.2.1. Systems in easterlies

(i) A low pressure area moved from southeast Bay and adjoining south Andaman Sea to southwest Bay between 4th and 8th. It weakened off Sri Lanka coast by the evening of 10th. Another low pressure area which developed over southeast Bay on 25th, moved westwards and lay over Comorin and adjoining Sri Lanka on the last day of the month.

(ii) A cyclonic circulation in the lower troposphere was observed over Comorin-Maldives area on 14th and 15th, which became less marked on 16th.

4.2.2. Systems in westerlies

(i) Last month's western disturbance moved away eastwards across Western Himalayas on 1st. Eight more western disturbances affected Western Himalayas, north Pakistan and neighbourhood during the month. The ninth western disturbance of the month lay over Punjab and neighbourhood on the last day of the month.

(ii) An induced cyclonic circulation in the lower troposphere lay over Punjab and Haryana on 25th. It merged on 26th with the western disturbance over Jammu & Kashmir and Himachal Pradesh.

(iii) Cyclonic circulations/troughs in the lower levels were observed to move across Bihar, West Bengal and Assam and adjacent States, between 11th and 14th, 14th and 17th and 25th and 26th.

The second spell of snowfall of the season occurred over Himachal Pradesh and Jammu & Kashmir on 13th and 14th. Rain or snow was also widespread over Western Himalayas on 31st and isolated over Jammu & Kashmir on 27th. Rain or thundershowers were generally widespread in the 4th week in Andaman & Nicobar Islands, with isolated heavy fall on 24th. They were also generally widespread on 14th and 15th in Assam & Meghalaya, on 15th in Nagaland, Manipur, Mizoram & Tripura and on 31st in Tamil Nadu and Rayalaseema. They were scattered or isolated on several days in Andaman & Nicobar Islands and Tamil Nadu and on a few days in coastal Andhra Pradesh and Rayalaseema. The weather over the rest of the country was mainly dry except for scattered or isolated rain on 1 or 2 days in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, plains of Uttar Pradesh, Punjab, Madhya Maharashtra, south interior Karnataka, Kerala and Lakshadweep.

4.3. Rainfall during the month

Rainfall for the month was excess in Andaman and Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya and Rayalaseema; normal in Sub-Himalayan West Bengal & Sikkim, east Uttar Pradesh, hills of west Uttar Pradesh and Haryana; deficient in Nagaland, Manipur, Mizoram & Tripura, plains of west Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, coastal Andhra Pradesh, Tamil Nadu, Kerala and Lakshadweep and scanty over Bihar plains, Punjab, east Rajasthan, west Madhya Pradesh, Konkan & Goa, Madhya Maharashtra and interior Karnataka. The weather was dry over the rest of the country. The significant amounts (cm) of rainfall were :

3rd : Kondul 4.

4th : Kondul 10.

5th : Kondul 5.

13th : Batote, Gurudaspur & Bhuntar 4 each.

14th : Cherrapunji 7, Pasighat 5, Car Nicobar 4.

15th : Silchar 5, Cherrapunji & Pasighat 4 each

16th : Nancowry 6.

17th : Car Nicobar 8.

18th : Car Nicobar 4.

20th : Car Nicobar 10, Kondul 5.

23rd : Port Blair 9, Long Island 6, Car Nicobar 4

24th : Maya Bandar 15, Port Blair 12, Kondul 5.

25th : Port Blair 17.

26th : Port Blair 5.

27th : Port Blair & Nancowry 4 each.

29th : Tennala 4.

30th : Punalur 6.

31st : Kalpa 13, Gurudaspur 8, Tiruchirapalli, Mannargudi & Rapur 7 each, Bhadarwa & Ansa 6 each.

4.4. Temperature

Night temperatures were generally below normal being appreciably so on a few days in Punjab, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, Gujarat State, Konkan & Goa and Madhya Maharashtra during the second fortnight of the month. They were also generally below to appreciably below normal in Sub-Himalayan West Bengal & Sikkim and Orissa between 19th and 23rd, in Marathwada between 19th and 26th and in Tamil Nadu and Kerala between 12th & 26th. Appreciably to markedly above normal night temperatures were recorded on a few days in interior Maharashtra, Andhra Pradesh and north interior Karnataka during the first and the last weeks and in northwest India during the second week of the month.