

Weather

551.553.21

POST MONSOON SEASON (OCTOBER-DECEMBER 1983)

1. Chief features

1. Complete withdrawal of the southwest monsoon from the country by 19 October and onset of north-east monsoon over Tamil Nadu and neighbourhood by 24th.

2. During the season three cyclonic storms formed in the Bay of Bengal and a depression over Sri Lanka, of which one storm and the depression affected India. (Tracks in Fig. 2).

3. Weather over north India and Saurashtra & Kutch was practically dry during the month of November and 1st fortnight of December.

4. Moderate cold wave conditions prevailed over west Rajasthan, north Gujarat State, Madhya Pradesh and interior Maharashtra between 25 and 28 December.

5. During the season rainfall was in large excess in Assam & Meghalaya, Gujarat region and Telangana; moderate excess in Gangetic West Bengal, Bihar Plateau and Marathwada; slight excess in Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura and Rajasthan; normal in Andaman & Nicobar Islands, Bihar plains, plains of Uttar Pradesh, Madhya Pradesh, Vidarbha, Konkan & Goa, Tamil Nadu and north interior Karnataka; slight defect in coastal Andhra Pradesh, coastal and south interior Karnataka; moderate defect in Sub-Himalayan West Bengal & Sikkim, Orissa, hills of west Uttar Pradesh, Haryana, Himachal Pradesh, Saurashtra & Kutch, Rayalseema, Kerala and Lakshadweep and large defect in Punjab, Jammu & Kashmir and Madhya Maharashtra (Fig. 1).

2. October

In this month two cyclonic storms formed in the Bay, one crossed north Andhra coast and the other Chittagong coast of Bangla Desh.

2.1. Cyclonic storms

(i) The low pressure area which lay over west central and adjoining northwest Bay on 1st, concentrated into a depression on 2nd over northwest Bay

centred near 18.3 deg. N and 86.5 deg. E. It intensified into a cyclonic storm on 3rd morning and crossed north Andhra coast, north of Visakhapatnam in the early hours of 4th and weakened into a deep depression over eastern Telangana and neighbourhood. Moving west to northwest it weakened into a well marked low pressure area over Marathwada and adjoining Telangana and Vidarbha on 6th. Thereafter, the system moved north to northeastwards and weakened over central parts of Uttar Pradesh by 12th. Under the influence of this system very heavy rainfall occurred in north coastal Andhra Pradesh on 4th and 5th and in Telangana on 5th and 6th. Significant amounts (cm) of rainfall were :

4th Visakhapatnam 19, Yellavanchili 18, Holalagundi 14.

5th Bhadrachalam 29, Dummugudam and Khammam 19 each, Polavaram 18, Chintalapudi 16, Narsipatnam, Yellandu and Warangal 15 each.

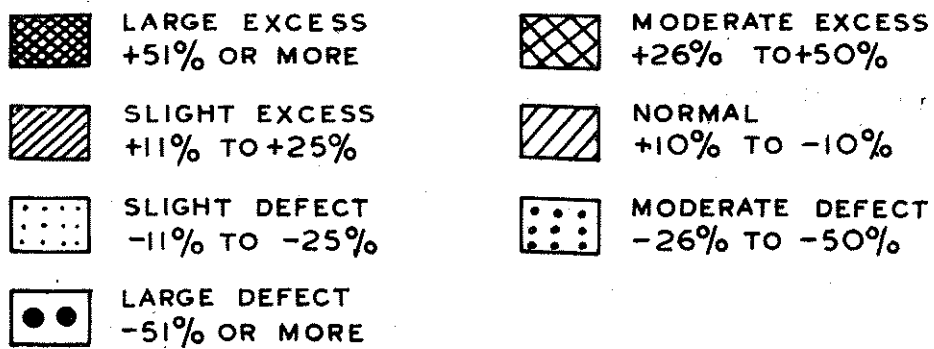
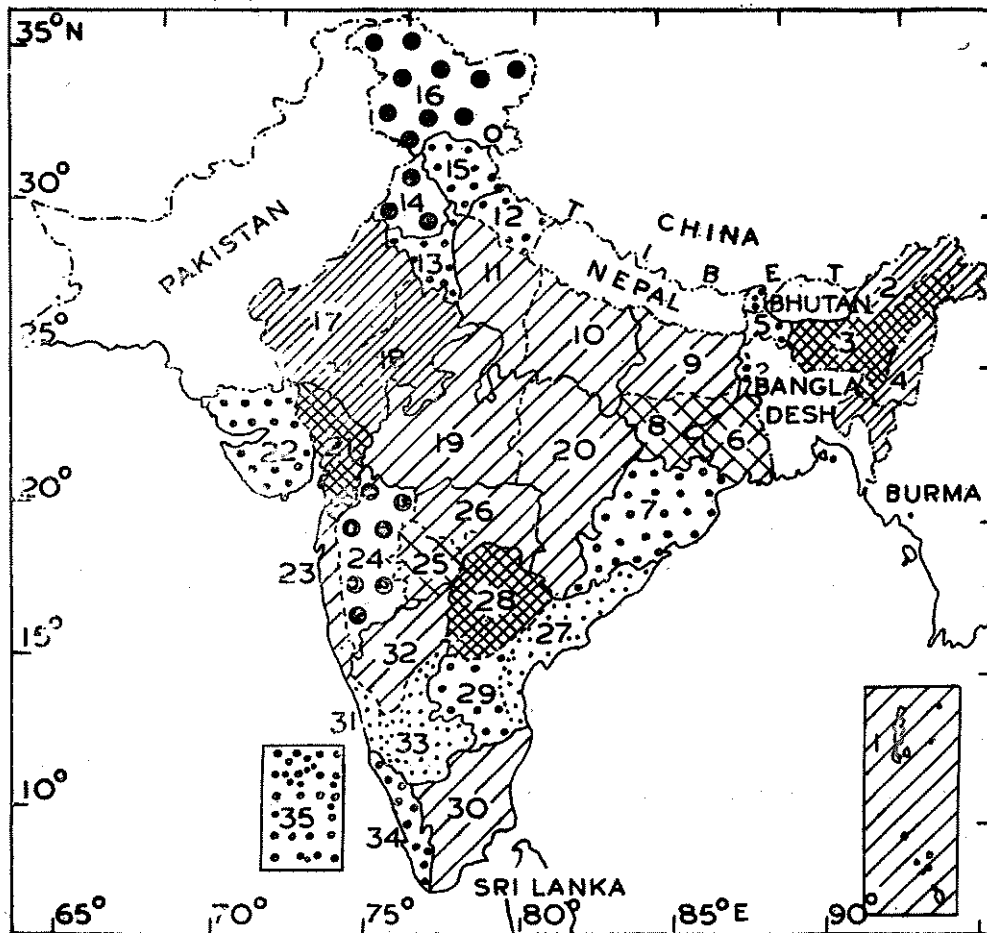
6th Nizamabad 36, Billoli 35, Bodhan 24, Madnoon 22, Nizamsagar & Chintapalli 21 each, Dadoor 20, Nizamsagar 17, Mudhole 16, Medak and Sangareddy 14 each.

According to press reports the death toll due to floods in Andhra Pradesh was 90. Crops on thousands of hectares of land were damaged and road and rail communications between Visakhapatnam and Vijayavada and between Vijayavada and Hyderabad disrupted.

(ii) The low pressure area which lay over north Andaman Sea and adjoining Tennasserim on 12th, moved northnorthwestwards and concentrated into a depression over northeast Bay on 14th. It intensified into a cyclonic storm on 15th and lay centred at 0830 IST near 20.9 deg. N, 91.5 deg. E. It crossed Bangla Desh coast 50 km northwest of Chittagong by the evening and weakened. Moving further northwards it became less marked over Arunachal Pradesh by 18th. Significant amounts of rainfall in cm associated with this system were : Silchar and Tezpur 9 each, Chaparmukh 8 on 16th.

2.2. Other systems

The following other systems affected the weather over the country during this month.



<i>Sub-divisions</i>	<i>Dep. from normal</i>	<i>Sub-divisions</i>	<i>Dep. from normal</i>
1 A & N Islands	-4	18 East Rajasthan	23
2 Arunachal	15	19 West M.P.	0
3 Assam & Megh.	66	20 East M. P.	5
4 N. M. M. & T.	13	21 Gujarat Reg.	172
5 S. H. W. B. Sikkim	-36	22 S & K	-31
6 G. West Bengal	27	23 Konkan & Goa	-1
7 Orissa	-34	24 Madhya Maharashtra	-52
8 Bihar Plateau	35	25 Marathwada	35
9 Bihar Plains	-4	26 Vidarbha	-5
10 East U. P.	-7	27 Coastal A. P.	-21
11 Plains West U. P.	-10	28 Telangana	126
12 Hills West U. P.	-41	29 Rayalaseema	-31
13 Haryana	-35	30 Tamil Nadu	10
14 Punjab	-56	31 Coast. Karnataka	-13
15 Himachal Pradesh	-45	32 N. I. Karnataka	-7
16 Jammu & Kashmir	-58	33 S. I. Karnataka	-23
17 West Rajasthan	23	34 Kerala	-27
		35 Lakshadweep	-48

Fig. 1

2.3. Systems over the Bay of Bengal

(i) A cyclonic circulation in the lower troposphere moved into northeast and adjoining east central Bay from the east on 6th. It moved over Gangetic West Bengal and adjoining Bangla Desh where a low pressure area formed on 8th. The system slowly moved westwards over Bihar Plateau by 11th and became less marked there by 14th.

(ii) The remnant of tropical storm *Kim* moving in a westnorthwesterly direction emerged into Andaman Sea and lay as a well marked low pressure area over north Andaman Sea on 19th. Moving northnorthwestwards it became unimportant over north Bay and adjoining Gangetic West Bengal and Bangla Desh on 23rd.

(iii) A low pressure area moved from south Andaman Sea to southwest Bay between 20th evening and 22nd. Associated cyclonic circulation extended to mid-tropospheric levels. It became less marked over southwest Bay by 28th.

(iv) Another low pressure area lay over south Andaman Sea on 28th. It moved over southeast Bay on 30th.

2.4. Systems over Peninsula and adjoining areas

(i) A cyclonic circulation extending upto 3.1 km a.s.l. developed over west Madhya Pradesh on 30 September. It became less marked there by 2nd.

(ii) A low pressure area developed over north Konkan and adjoining sea areas on 7th. It became less marked over Kutch and adjoining south Pakistan on 11th. A trough from this system extended to Lakshadweep on 3 to 4 days.

(iii) A low level cyclonic circulation developed over north Madhya Maharashtra and adjoining Marathwada on 17th. It became less marked over north Madhya Maharashtra and adjoining south Gujarat on 19th.

(iv) A cyclonic circulation in the lower troposphere formed over Lakshadweep on 24th where a low pressure area developed on 27th. It persisted there till 2 November. A trough extended northwards from this system to Maharashtra coast from 29 October to 2 November.

2.5. Western disturbances and other systems over northwest India

(i) Seven western disturbances moved away across Western Himalayas during the month. The eighth western disturbance lay over Jammu & Kashmir and neighbourhood on 31st.

(ii) Three troughs in middle and upper tropospheric westerlies affected north India. They were between 10th & 12th, 16th & 18th and 20th & 23rd.

Under the influence of these systems southwest monsoon was vigorous on 2 to 3 days in Gangetic West Bengal, east Madhya Pradesh, Marathwada, coastal Andhra Pradesh, Telangana and on one day each in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Bihar and south interior Karnataka and active on 2 to 3 days in Assam & Meghalaya, Gange-

tic West Bengal, Orissa, Bihar Plateau, coastal Andhra Pradesh, Tamil Nadu and south interior Karnataka and on one day each in Arunachal Pradesh, east Madhya Pradesh, Gujarat State, Konkan & Goa, Marathwada and Rayalaseema. Southwest monsoon withdrew from Uttar Pradesh, northwest Madhya Pradesh and Gujarat State by 5 October, from Bihar plains, rest of Madhya Pradesh, Maharashtra State by 14 and from the rest of the country outside Tamil Nadu and Kerala by 19th.

Northeast monsoon set in over Tamil Nadu on 24th. It was active on 1 to 2 days in Tamil Nadu and Kerala.

Generally widespread rain/thundershowers also occurred on 12 days in Andaman and Nicobar Islands and on 1 to 4 days in Assam & Meghalaya, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, Andhra Pradesh and Karnataka with isolated heavy falls on 1 or 2 days in some of these places.

2.6. Rainfall

2.6.1. *October* — The rainfall during the month was excess in Assam & Meghalaya, Gangetic West Bengal, Bihar Plateau, Rajasthan, Madhya Pradesh, Gujarat Region, Marathwada and Telangana, normal in Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura, Bihar plains, Uttar Pradesh, Himachal Pradesh, Jammu & Kashmir, Saurashtra & Kutch, Konkan & Goa, Vidarbha, coastal Andhra Pradesh and interior Karnataka. It was deficient over the rest of the country.

The significant amounts of rainfall in cm, other than those very heavy rainfall figures given in connection with the cyclonic storms were :

1st	Tambaram, Kanchipuram, & Atchanta 10 each, Pondicherry, & Sironcha 9 each, Madras 8, Bhadrachalam 7
2nd	Bombay 7
3rd	Umerga 14, Tuljapur 10, Kalingapatnam, Osmanabad and Supaul 8 each, Waltair 7
4th	Pottangi 14, Kumta 11, Honavar & Bobbili 10 each, Mangalore AP & Shirali 9 each
5th	Mahira 14, Hanamkonda 12, Nalgonda 10, Mahabuabad & Nidadavole 9 each
6th	Kandhar 26, Ahmadpur 14, Chandbali 9, Peermedu 8
7th	Parbhani 12, Ambejogai 11, Ahmadpur 10, Yelderi 9
8th	Chendipada (Orissa) 11, Calcutta 8
9th	Idar 11, Viramgaon & Champua 9 each
10th	Beharampur 19, Hasanganj 18, Dharmpur (Gujarat) 13, Burdwan 12
11th	Gwalior 10, Bahraich, & Fatehpur 9 each, Bulsar 8
12th	Sardarnagar (Uttar Pradesh) 21, Rath 14, Daman & Dahanu 10 each
13th	Khadda (Uttar Pradesh) 10, Tuljapur 7
15th	Atchanta & Koderu 10 each
17th	Shivaganga 14, Sankaridurg 9, Nilakottai, Madurai & Dindigul 8 each
18th	K. Parmathi & Karur 10 each, Madurai & Kadur 9 each

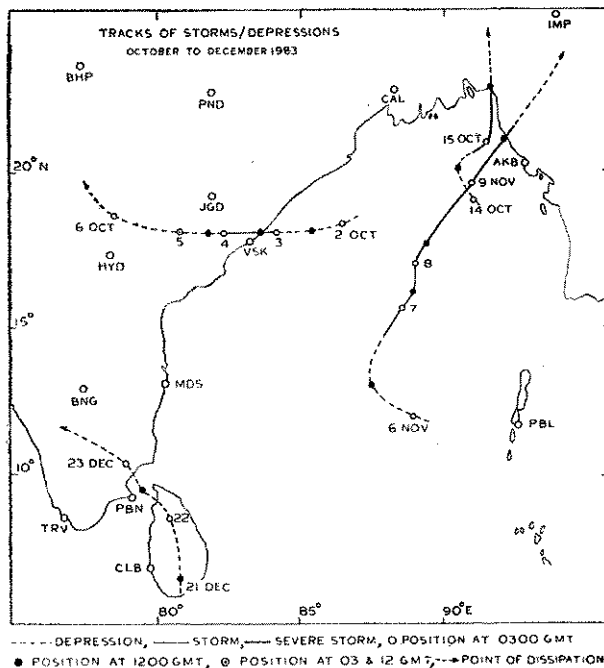


Fig. 2

- 22nd Kovilpathi (Tamil Nadu) 7
 25th Sriperumbudur (Tamil Nadu) 13, Madras 11
 26th Madras, Sullurpet & Adoni 7 each
 27th Kakinada, Narsapur & Tirupati 8 each, Rapur 7
 28th Yemmiganur (Andhra Pradesh) 16, Nellore 11, Kavali 10, Ongole 9
 29th Parangipettai 11, Lingadahalli (Karnataka) 9
 30th Coonoor 13, Rapur 11, Sullurpet & Nellore 9 each, Hassan & Mysore 8 each.

2.7. Temperature

During the first fortnight day temperatures were above normal on 8 to 12 days in plains of west Uttar Pradesh, Rajasthan and Tamil Nadu being appreciably so on 1 to 3 days in the first two sub-divisions and were appreciably below normal on 2 to 5 days in Kashmir and Gujarat Region. In the second fortnight of the month above normal day temperatures were recorded on 6 to 10 days in Assam & Meghalaya, Konkan & Goa and coastal Karnataka being appreciably so on 3 days in coastal Karnataka.

Night temperatures were generally below normal in Bihar plains, Punjab, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, west Madhya Pradesh and Vidarbha in the second fortnight being appreciably so on 6 to 7 days in Bihar plains and Jammu. They were appreciably above normal on 2 to 4 days in east Uttar Pradesh, hills of west Uttar Pradesh, Haryana, east Rajasthan and Madhya Pradesh during the first fortnight.

3. November

In this month only one intense system, a severe cyclonic storm formed in the Bay of Bengal which did not affect the country.

The weather over the whole country was generally dry outside south Peninsula. Also no system from Bay of Bengal or Arabian Sea moved inland during the month.

3.1. Systems in the Bay of Bengal and Arabian Sea

(i) Last month's low pressure area over southeast Bay concentrated into a depression by 6th evening centred near 12.0° N, 89.0° E. Moving north-north-eastwards it intensified into a cyclonic storm on 7th centred near 15.5° N, 88.5° E. It became a hurricane on 9th and crossed Bangla Desh coast near Cox's Bazar by the same evening. It weakened over north Burma and became unimportant by 10th evening.

(ii) A low pressure area with associated cyclonic circulation upto 3.6 km a.s.l. lay over southeast Bay on 10th. Moving northwestwards it lay over east central and adjoining west central Bay on 14th. Thereafter it moved northeastwards and became less marked over northeast Bay by 17th.

(iii) A cyclonic circulation upto 4.5 km a.s.l. was seen over southeast Bay on 14th. Under its influence a low pressure area formed over south and adjoining west central Bay on 17th and persisted there till 21st. Then it moved slowly northeastwards and became less marked over east central Bay on 24th.

(iv) A cyclonic circulation between 2.1 and 5.6 km a.s.l. developed over west central Bay off Andhra-south Orissa coasts on 25th. It became less marked there by 27th.

(v) A cyclonic circulation in the lower troposphere developed over Lakshadweep area on 24th. Moving northwards it became less marked off Maharashtra coast on 29th.

(vi) A low pressure area formed over southeast and adjoining central Bay on 25th with associated cyclonic circulation extending upto 1.5 km a.s.l. It moved across south Bay and lay over extreme south Peninsula and adjoining Comorin area on 30th.

(vii) A low pressure area formed over Lakshadweep-Maldives areas on 27th. It slowly moved westwards and lay over southeast Arabian Sea on 30th.

(viii) A low pressure area developed over south Andaman Sea on 29th which persisted there on 30th.

3.2. Other systems

(i) The western disturbance of the last month and seven others moved across the Western Himalayas during the month.

(ii) Troughs in middle and upper tropospheric westerlies moved across northern India between (a) 30 September and 3rd evening, (b) 6th and 10th and (c) 23rd and 25th.

(iii) A cyclonic circulation upto 3.1 km a.s.l. lay over Bangla Desh and adjoining Tripura and Mizoram on 10th. It became less marked over Nagaland and Manipur by 13th.

(iv) Another low level cyclonic circulation was seen over Bangla Desh and adjoining Nagaland, Manipur, Mizoram and Tripura on 18th. It moved away eastwards by 21st.

The western disturbances were inactive excepting the one between 3rd and 8th which caused fairly

widespread rain and snow on 6th in Jammu & Kashmir. Widespread rain or thundershowers occurred in Nagaland, Manipur, Mizoram and Tripura on 10th. They were scattered or isolated on a couple of days in Assam and adjacent States.

Rain or thundershowers were generally widespread on most days in Andaman and Nicobar Island upto 24th and in coastal Karnataka in the first week with isolated heavy falls on 2 to 3 days. It was so on 1st in Konkan and Goa. Scattered or isolated rain or thundershowers did occur on 2 to 5 days in Madhya Maharashtra, coastal Andhra Pradesh and north interior Karnataka in the first week and on 1 to 3 days in Marathwada, coastal Andhra Pradesh, Telangana and north interior Karnataka in the last week of the month. Northeast monsoon was active on 3 days in Tamil Nadu and 5 days in Kerala during the first week and was so in Tamil Nadu on 28th and 29th.

3.3. Rainfall

Rainfall for November was excess in Andaman and Nicobar Islands, normal in Gangetic West Bengal and Kerala, deficient in Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura, Jammu & Kashmir, coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, coastal & north interior Karnataka and Lakshadweep and scanty in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Orissa, Himachal Pradesh, Madhya Pradesh, Maharashtra, Telangana and south interior Karnataka. Dry weather prevailed over the rest of the country.

The notable amounts (cm) of rainfall were :

1st	Kandukur 14, Kavali & Atamkur 13 each, Punalur 11
2nd	Palghat 12, Parli 11, Tuticorin & Tondi 10 each, Trichur & Chittur 7 each
3rd	Parli 14, Erode 13, Natham 10, Pamban 9, Satyamangalam & Coondapur 8 each
4th	Coimbatore AP & Shivaganga 9 each, Satyamangalam 8, Nilakottai 7.
5th	Kondul & Nancowry 8 each, Alleppey, Quilon & Elluni 7 each
6th	Puttur & Belthangadi 6 each
7th	Punalur 15, Srivilliputtur 12, Hut Bay 6
10th	Kondul 7, Nancowry 6
11th	Nancowry 10
17th	Port Blair 6, Maya Bandar 4
18th	Punalur 5
22nd	Mannargudi 7
27th	Nellore & Madras AP 5 each
28th	Pondicherry 31, Cuddalore 12, Karaikal 5
29th	Kondul 10, Karaikal 8, Mannargudi & Nagapattinam 7 each
30th	Pamban & Atirampattinam 5 each

3.4. Temperature

Night temperatures were generally below normal in Rajasthan, Madhya Pradesh and Gujarat State from 1st to 18th and in Vidarbha and Peninsula outside Kerala from 6th to 25th, being appreciably to markedly

so on 5 to 11 days in west Madhya Pradesh, Gujarat Region, Konkan and Goa, Madhya Maharashtra, Vidarbha, Telangana, Rayalaseema and Karnataka and on 1 to 2 days in Marathwada and coastal Andhra Pradesh. Appreciably to markedly below normal night temperatures were also recorded on 9 days in Jammu during the month.

4. December

During this month a depression affected extreme south Peninsula. Though several western disturbances moved across the Western Himalayas the weather over north India was practically dry upto 3rd week of the month.

4.1. Systems in the Bay of Bengal

Six low pressure areas and three cyclonic circulations developed in the south Bay and Arabian Sea and adjoining land areas of which one attained the intensity of a depression.

(i) In the seasonal trough a low pressure area developed over southwest Bay off Sri Lanka on 20th. By 21st another well marked low pressure area formed over northeast Sri Lanka. This system concentrated into a depression by 21st evening centred about 120 km southeast of Colombo. Moving northnorthwestwards it crossed south Tamil Nadu coast near Atirampattinam in the early hours of 23rd and subsequently weakened over interior parts of Tamil Nadu and adjoining Kerala by 24th. This system caused very heavy rains in Tamil Nadu which claimed, according to press reports, a death toll of 64 lives besides marooning scores of villages and submerging thousands of acres of paddy field.

(ii) In the seasonal trough one low pressure area was seen over south Andaman Sea between 5th and 6th and another over southeast Bay and neighbourhood on 26th. Besides these a low pressure area lay over southeast Arabian Sea between 5th and 6th. Another low pressure area developed over south Kerala on 22nd which became less marked over southeast Arabian Sea on 28th and one persisted off Kerala-Karnataka coasts from 27th to 31st.

(iii) Three cyclonic circulations in the lower troposphere was seen over southwest Bay off Sri Lanka coast one on 1st which became less marked by next day and the other on 8th. It moved westwards across Comorin and became less marked over Lakshadweep and neighbourhood on 10th. The third one was seen on 12th which became less marked over Comorin and neighbourhood on 16th.

(iv) A trough in easterlies between 2.1 and 3.1 km a.s.l. extending from east Sri Lanka to south interior Karnataka was seen on 2nd. Moving westwards it became unimportant off west coast on 5th.

4.2. Systems in westerlies

(i) Five western disturbances moved away eastwards across Western Himalayas and neighbourhood. The sixth one lay over Jammu & Kashmir on 30th. It persisted there on 31st.

(ii) An induced cyclonic circulation in the lower levels, which developed over Himachal Pradesh and neighbourhood on 2nd became less marked over north Uttar Pradesh on 4th.

(iii) Two cyclonic circulations in the lower troposphere developed over east central Arabian Sea, one on 8th off Maharashtra coast, which became less marked there on 11th and another off north Maharashtra-south Gujarat coasts on 12th, which moved over Saurashtra & Kutch and adjoining southeast Pakistan on 14th and became less marked there by 17th.

(iv) A low level cyclonic circulation moved from southwest Rajasthan and Kutch across north Madhya Pradesh, east Uttar Pradesh to Assam and neighbourhood between 24th and 28th.

(v) Three troughs in mid and upper tropospheric westerlies affected northwest India and neighbourhood, one between 3rd and 5th, the other between 9th and 11th and the third one between 14th and 17th. Besides these another trough in these levels moved across north India between 24th and 27th.

The systems in westerlies caused generally widespread rain or thundershowers on 1 to 2 days in northeast India outside Bihar State in the last week of the month and in plains of west Uttar Pradesh and Himachal Pradesh on 26th, in Jammu & Kashmir on 17th and 19th. They were scattered or isolated on 3 to 5 days in Haryana, Punjab and Jammu & Kashmir between 15th and 26th. Rain or snow was generally widespread in Himachal Pradesh on 25th and 27th and isolated in Jammu & Kashmir on 26th.

The systems in easterlies caused generally widespread rain or thundershowers on 3 to 4 days in south interior Karnataka and Kerala and on 1 to 2 days in Andaman & Nicobar Islands, Andhra Pradesh, coastal and north interior Karnataka during the last week of the month. Northeast monsoon was active on 3rd, 4th, 15th and 16th and vigorous from 22nd to 26th in Tamil Nadu. Scattered or isolated rain/thundershowers occurred on most of the remaining days of the month in Tamil Nadu and Kerala.

4.3. Rainfall

Rainfall during December was excess in northeast India, east Uttar Pradesh, east Madhya Pradesh, Vidarbha, Telangana, Rayalaseema, Tamil Nadu, Karnataka and Kerala; normal in Haryana, Marathwada, coastal Andhra Pradesh and Lakshadweep; deficient in Andaman & Nicobar Islands, plains of west Uttar Pradesh and Konkan & Goa; scanty over the rest of the country outside Gujarat State where there was no rain.

The significant amounts (cm) of rainfall were :

3rd	Dindigul 5
6th	Karaikal 5
11th	Nagapattinam & Karaikal 5 each
15th	Mannargudi & Karaikal 5 each
16th	Mayiladuturai 13, Kondul 7, Kumbhakonam 6
21st	Pamban 13, Atirampattinam 6, Nagapattinam 5
22nd	Nagapattinam 32, Karaikal 29, Mannargudi & Vedaranniyam 25 each, Atirampattinam 22, Pamban 20, Kumbhakonam 15, Thanjavur 14
23rd	Atirampattinam 39, Tiruchirapalli 26, Ariyalur 24, Kumbhakonam & Thanjavur 21 each, Vedaranniyam & Pondicherry 16 each, Cuddalore 15, Nagapattinam & Tondi 14 each
24th	Madras AP 14, Tambaram 12, Tirupati AP 11, Shivaganga 10, Tirutani 9, Coonoor & Kanchipuram 7 each
25th	Vellore 12, Cuddalore 6, Parangipettai 5
26th	K. Paramathi 9, Shivaganga 8, Coonoor 6, Coimbatore & Madras city 5 each
27th	Nancowry & Car Nicobar 9 each, north Lakhimpur & Sandheads 6 each
28th	Pondicherry 9
30th	Trivandrum 10, Punalur 7, Alleppey 6, Cochin 5.

4.4. Temperature

Night temperatures were generally normal or below normal in northeast India and Uttar Pradesh during the month. They were so in northwest India, Madhya Pradesh and Gujarat State during the first, second and the last week of the month, being appreciably so on 4 to 5 days in south Rajasthan and southwest Madhya Pradesh.

They were generally above or appreciably above normal in Orissa and Bihar Plateau between 24th and 27th, in plains of Uttar Pradesh between 20th and 27th, in Jammu & Kashmir, Rajasthan and west Madhya Pradesh between 14th and 15th, in Gujarat State between 13th and 20th, in Madhya Maharashtra between 11th and 26th and in Andhra Pradesh, Tamil Nadu and Karnataka from 11th to 30th.

Moderate cold wave conditions prevailed on 1 to 3 days at a few places in west Rajasthan, north Gujarat State, Madhya Pradesh and interior Maharashtra between 25th and 28th.