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Weather

POST MONSOON SEASON (OCTOBER-DECEMBER 1976)

CHIEF FEATURES

Cyclonic storms/depressions

Five cyclonic storms of which three were severe, developed in the Bay of Bengal and a cyclonic storm and a depression in the Arabian Sea. North coastal Tamil Nadu, coastal Andhra Pradesh and Bay Islands experienced very heavy rain and damage due to the Bay storms. Madras city had a record rainfall of 45 cm on 25 November and Port Blair 37 cm on 31 December. Most of the storms were of small size with the area of winds of gale force being confined to less than 100 km from the centre. The tracks of these cyclonic storms and depressions are given in Fig. 1.

Withdrawal of southwest monsoon

The southwest monsoon withdrew from the country outside the extreme south Peninsula by 12 October. The withdrawal from north Peninsula, northeast India and central parts of the country which took place during October was near about the normal dates.

Western disturbances

Nineteen western disturbances moved eastwards across northwest India during the season. However, the rainfall in the Western Himalayas for this season was only scanty.

Rainfall

The rainfall for the season was normal or in excess in Bay Islands, coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, Kerala, Lakshadweep, Gujarat State, Rajasthan, west Madhya Pradesh and Arunachal Pradesh and deficient or scanty over the rest of the country. The rainfall distribution over the country for the period from 1 October to 31 December 1976 as percentage departure from normal, is shown in Fig. 2.

Temperature

Day temperatures were generally above normal in many parts of the country in October. Night temperatures were above normal over most of the country in November. They were generally below normal in north India and above normal in the Peninsula and central parts of the country in December.

SIGNIFICANT MONTHLY FEATURES

OCTOBER

Under the influence of an upper air cyclonic circulation moving westwards across south Peninsula, a low pressure area formed over Comorin-Maldive area and off south Kerala coast on 8th. Moving slowly westnorthwestwards, it became well marked by 10th over southeast Arabian Sea to the west of Maldive-Lakshadweep area and concentrated into a depression by 12th evening near Lat. 11°N, Long. 70°E. Moving in a westerly direction, it intensified into a cyclonic storm by 14th evening with its centre near 12°N, 63°E. Continuing to move westwards, it weakened into a low near Gulf of Aden by 19th. This system when it lay as a low over Lakshadweep and neighbourhood, caused generally widespread rain with a few heavy to very heavy falls over Kerala and Lakshadweep between 10th and 12th.

A low pressure area from the east which entered south Andaman Sea on 12th, moved further westwards and concentrated into a deep depression on 15th morning over south Bay, with its centre near 9·5°N, 85·5°E. The depression moved northwest and intensified into a cyclonic storm on 16th morning with its centre near 12·5°N, 82·5°E. It weakened into a deep depression and lay about 50 km to the east of Madras on the morning of 17th. Later it recurved northeastwards and again

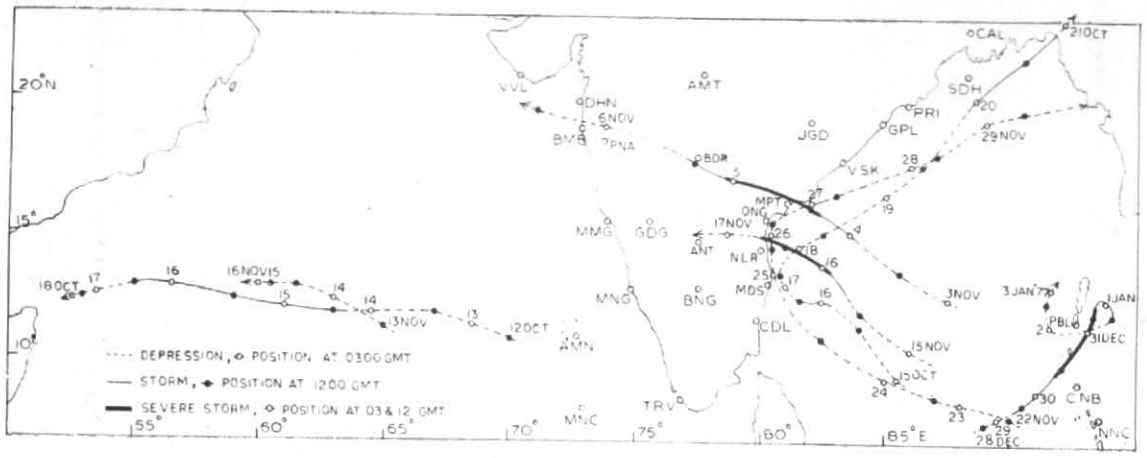

Fig. 1. Tracks of storms/depressions during October-December 1976

intensified into a cyclonic storm on 20th over north Bay, about 300 km to the south of Calcutta. It crossed Bangla Desh coast near Chittagong on 21st (early morning) and weakened into a low over north Burma and adjoining areas by the same evening. In association with this system, generally widespread rain occurred in Bay Islands from 12th to 19th, in north Tamil Nadu on 16th and 17th, in coastal Andhra Pradesh and Rayalaseema on 17th and 25th, in Orissa from 18th to 20th and in Gangetic West Bengal on 20th and 21st. Some heavy to very heavy falls were reported from north Tamil Nadu, Rayalaseema, coastal Andhra Pradesh and Orissa on two or three days during this period. Sulurpet and Nellore recorded exceptionally heavy falls of 41 and 32 cm respectively on 17th.

According to press reports, heavy rains in Madras city (more than 30 cm in 3 days) inundated low lying areas and paralysed the city life. Very heavy rains in Nellore district caused floods and breaches in rivers which affected more than 50 villages resulting in some damage to crops in that district. Road and rail communications in the coastal areas of north Tamil Nadu and south coastal Andhra Pradesh were disrupted due to breaches.

A trough of low pressure lay extending from Bihar plains to north Bay from 1st to 6th. The southern end of a trough in westerlies in mid tropospheric levels also moved from Bihar plains to Assam and adjacent States between 1st and 4th. A cyclonic circulation in lower tropospheric levels moved slowly eastwards across West Bengal and Assam & adjacent States between 7th and 10th. In association with these systems rain or thundershowers were fairly widespread in Nagaland, Manipur, Mizoram and Tripura on 7th and 8th. They were also scattered to fairly widespread in Sub-Himalayan West Bengal and Sikkim and scattered or isolated in Bihar plains and Assam & Meghalaya on many days between 1st and 10th. Isolated or scattered rainfall occurred over the rest of northeast India on a few days. One or two heavy falls were also reported from Bihar plains on 1st, from Gangetic West Bengal on 2nd and from Sub-Himalayan West Bengal and Sikkim on 8th.

A trough in lower troposphere lay over Assam and adjacent States on most days between 21st and 27th. A trough in the middle troposphere also moved eastwards across northeast India between 20th and 21st. Under the influence of these systems, scattered or isolated rain or thundershowers occurred over Assam & adjacent States and in Sub-Himalayan West Bengal & Sikkim on most days from 20th to 26th. A few heavy falls were also reported from Assam & adjacent States on 23rd.

A low pressure area lay off south Maharashtra-Goa-Karnataka coasts and adjoining Lakshadweep during the first week. A wind discontinuity in low levels extended from south Konkan to southeast Mydhya Pradesh on 3rd and 4th and from north Konkan to central parts of Madhya Pradesh on 5th. Two cyclonic circulations in the lower troposphere moved westwards across extreme south Peninsula and Comorin area to southeast Arabian Sea and adjoining Lakshadweep-Maldive area in the first week. In association with these systems, rain or thundershowers were scattered to fairly widespread in Kerala and Lakshadweep on many days in the first week and scattered or isolated in Tamil Nadu and coastal Andhra Pradesh on many days and in Maharashtra and Karnataka State on a few days.

The seasonal low pressure area lay over southwest Bay off Sri Lanka-Tamil Nadu coasts between 7th and 13th causing scattered to fairly widespread rain or thundershowers in Tamil Nadu during this period with one or two heavy falls on 7th and 12th.

A trough of low lay off Kerala-Karnataka coasts from 14th to 24th. It extended to south Konkan-Goa coasts between 21st and 24th. This system caused scattered to fairly widespread rain or thundershowers in Kerala on most days, in Laksha dweep, coastal and south interior Karnataka on four or five days and in Konkan on 23rd and 24th.

A north-south trough upto 0·9 km extended from Telangana to south Tamil Nadu from 23rd to 25th. A low developed in this trough over interior Karnataka on 26th and moved westwards across coastal Karnataka to east central Arabian Sea where it lay off south Maharashtra-Goa-Karnataka coasts on 28th and later weakened. Under the influence of these systems rainfall was scattered or isolated over most parts of the Peninsula between 25th and 28th. Fairly widespread rain with one or two heavy falls were also reported from Kerala on 29th.

The principal report of heavy rainfall over the country during the month were :

Date	*Station*	*Rainfall (cm)*
12	Palghat	14
	Dindigul	10
15	Mayuram	13
	Sirkali	12
	Nagapattinam	10
	Vedaranniyam	10
16	Sriperumbundur	20
	Parangipettai	18
	Madras City	15
	Cuddalore	15
	Madras Airport	12
	Karaikal	11
	Pondicherry	10
17	Sulurpet	41
	Nellore	32
	Sriperumpudur	28
	Rapur (CAP)	21
	Koderu (CAP)	13
	Pakala (Woolapalam)	13
	Madras	13
	Vellore	13
	Amalapuram	12
	Chandbali	11
	Madurantakam	11
	Kanchipuram	11
18	Nellore	21
	Paradip	15
	Kalingapatnam	14
	Sriperumpudur	11
	Amalapuram	11
	Madurantakam	10
19	Paradip	19
	Ersama (Orissa)	16
	Chandbali	12
	Rajkanika (Orissa)	11
	Kendrapara (Orissa)	10

Seven western disturbances moved eastwards across the Western Himalayas, five in the first fortnight and two in the second fortnight. Two induced lows also moved eastnortheastwards from south or central Pakistan to the hills of west Uttar Pradesh between 6th and 15th. The first five western disturbances and the two induced lows caused generally widespread rain in the Western Himalayas on 1st, in Jammu & Kashmir on 7th and in Himachal Pradesh on 8th. Scattered or isolated rain also occurred in the Western Himalayas on a few other days in the first fortnight and in the plains of northwest India and Uttar Pradesh on three or four days. In association with the other two western disturbances, rainfall was isolated in Himachal Pradesh on 22nd and scattered or isolated in the Western Himalayas between 24th and 26th. Munsyari recorded 5 cm of rain on 4th, Gulmarg 4 cm and Amritsar & Gurdaspur 2 cm each on 7th and Srinagar, Quazigund and Banihal 2 cm each on 25th.

The southwest monsoon withdrew from north Konkan, north Madhya Maharashtra, Marathwada and west Vidarbha on 1st, from east Uttar Pradesh and northeast Madhya Pradesh on 3rd and from Orissa, Bihar, southeast Madhya Pradesh, east Vidarbha and north coastal Andhra Pradesh and Telangana on 6th. It withdrew from south Konkan, Goa, south Madhya Maharashtra and north interior Karnataka on 8th, from West Bengal and Sikkim on 10th and from Assam & adjacent States, south coastal Andhra Pradesh and Rayalaseema on 12th.

Day temperatures were generally above normal over the country during the month, being appreciably so in some parts of Madhya Pradesh, interior Maharashtra State, interior Karnataka, Telangana and Rayalaseema on many days. They were appreciably to markedly above normal in west coastal Saurashtra from 17th to 20th. Night temperatures were above normal in some parts of Maharashtra and Gujarat States between 9th and 14th and in northwest India, Madhya Pradesh, Maharashtra and Gujarat States from 22nd to 25th. They were below normal in many parts of northeast India on some days in the month and in many parts of the Peninsula during the last week.

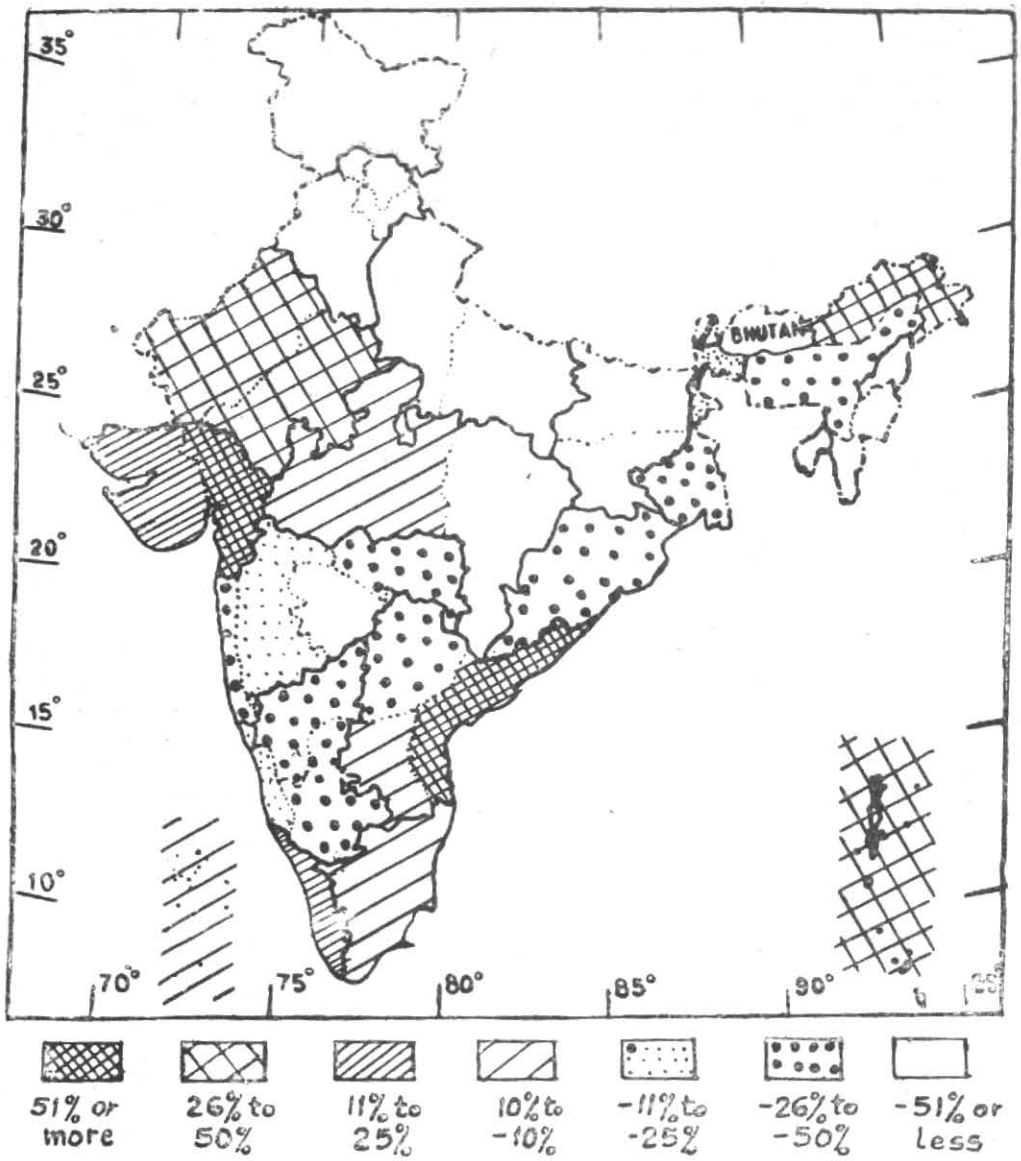

Fig. 2. Rainfall for the period 1 October to 31 December 1976 (Percentage departure from normal)

NOVEMBER

A low pressure area moving westwards from the Gulf of Siam became well marked over the Andaman Sea on 2nd. Later, it moved in a northwesterly direction and concentrated into a depression over the central parts of the Bay near 12·5°N, 87·5°E on 3rd morning. It intensified into a cyclonic storm on 4th morning when it was centred about 300 km southeast of Kakinada. Continuing to move in a northwesterly direction, it became severe that evening and crossed Andhra coast just north of Masulipatnam on the night of 4th. It maintained its intensity over land upto 5th morning when it was centred about 50 km southeast of Hyderabad. Moving westnorthwestwards, it gradually weakened into a depression and emerged into the Arabian Sea off north Maharashtra coast by 6th afternoon and lay as a well marked low pressure area off Gujarat coast on 7th and 8th. A trough extended from the low to west Madhya Pradesh and east Rajasthan on these two days. In association with this system, there was a marked increase in rainfall activity over the Peninsula and central parts of the country. Rainfall was generally widespread in Bay Islands on 2nd and 3rd, in coastal Andhra Pradesh on 5th and 6th, in Madhya

Maharashtra, Telangana and north interior Karnataka on 6th and in west Madhya Pradesh on 8th. Scattered or isolated rain also fell in Gangetic West Bengal and Orissa on some days between 4th and 7th and in Rajasthan, Gujarat State, Madhya Pradesh and Maharashtra State on 7th and 9th. A few heavy to very heavy falls were reported from coastal Andhra Pradesh between 5th and 7th. According to press reports about 18 people lost their lives and a large number of houses were damaged in Andhra Pradesh. Considerable damage to paddy, banana, sugarcane, cotton and tobacco crops was reported from Krishna district. Many trees and electric poles were uprooted in Masulipatam area. Masulipatam port was reported to have suffered damage to the extent of about 1 lakh rupees.

A low pressure area that lay to the west of Lakshadweep on 13th morning, concentrated into a depression that evening in southeast Arabian Sea with its centre near 11·5°N, 65·0°E. It later moved westwards and dissipated over west central Arabian Sea by 17th. Weather over the country was not affected by this depression.

A well marked low pressure area moved from the east into south Andaman Sea and adjoining southeast Bay on 14th morning. Moving westnorthwestwards, it concentrated into a depression by 15th morning over southeast and adjoining southwest Bay near 10·5°N, 86·0°E. Thereafter, it moved northwestwards and rapidly intensified into a severe cyclonic storm by 16th morning when it was centred about 250 km eastnortheast of Madras. Moving westnorthwestwards, the severe cyclonic storm crossed south Andhra coast between Nellore and Kavali (about 35 km north of Nellore) on 16th midnight. Weakening thereafter, it lay as a deep depression over south coastal Andhra Pradesh and adjoining Rayalaseema on 17th morning. Moving westwards and weakening further, it emerged as a low pressure area into east central Arabian Sea off Karnataka coast by 19th. It weakened into a trough off Maharashtra coast the next day. Due to this system, rain or thundershowers were generally widespread in Bay Islands on 15th, in Tamil Nadu and Kerala between 15th and 18th and in coastal Andhra Pradesh on 17th and 18th and scattered or isolated in Telangana and Rayalaseema on 18th and over Karnataka on 19th. A few heavy to very heavy falls were also reported from south coastal Andhra Pradesh on 17th and 18th. According to press reports, because of heavy rains and high winds this cyclone claimed 30 lives and caused considerable damage to tobacco, betel vine, banana and mango gardens in Kavali and Kovvur taluks of Nellore district. Electric and telephone poles and trees were uprooted and about 10,000 houses were damaged. Minor damage also occurred in Nellore and Atmakur taluks. Tiles and asbestos roofs were blown off at many places between Nellore and Kavali.

A low pressure area which moved into south Andaman Sea from the east on 21st, moved westnorthwest and concentrated into a depression on 22nd evening over southeast Bay with its centre near 8°N, 90°E. Becoming deep the next morning and continuing to move westnorthwestwards upto 24th and later northwestwards, it lay centred about 50 km northeast of Madras on 25th morning. Then it skirted south Andhra coast, recurved and intensified into a cyclonic storm on 27th morning when it was located about 100 km south of Kakinada. It again weakened into a deep depression the same evening and moving northeastwards, lay as a low pressure area over north Arakan coast on 30th morning. In association with this system, rain or thundershowers were generally widespread in Bay Islands from 22nd to 25th and in extreme north Tamil Nadu, coastal Andhra Pradesh and Rayalaseema between 25th and 27th. They were also scattered or isolated in Gangetic West Bengal, Orissa and Telangana from 26th to 28th. Some heavy to very heavy falls were reported from Bay Islands, Tamil Nadu, coastal Andhra Pradesh and Rayalaseema between 22nd and 28th. Madras received an all time record rainfall on 25th, with Nungambakkam reporting 45 cm and Meenambakkam 35 cm.

The unprecedented and torrential rainfall that lashed Madras city and adjoining areas flooded low lying areas affecting about 3 lakhs people particularly in the slum areas. Many houses collapsed in Madras city. Power supply was disrupted. Train services in the Madras-Gudur-Renigunta sections were dislocated. There was extensive damage to roads and telecommunication systems. About 50 people lost their lives due to house collapses and electrocution. Very heavy rain in Nellore district is reported to have caused floods in *Kalindi* and *Swarnamukhi* rivers damaging a large number of houses. The death toll was about 45. Crops in Nellore, Guntur, Krishna, Chittoor, Cuddapah and East Godavari districts were damaged.

According to press reports, 159 persons were killed, 1,90,000 houses collapsed or were damaged severely and paddy in 16 lakh acres and other crops in 4·5 lakh acres were affected as a result of the three successive cyclones which hit Andhra coast during November.

A low pressure area lay off Sri Lanka-Tamil Nadu coasts on 1 and 2 November. It caused fairly widespread rain with isolated heavy falls in Tamil Nadu and Kerala from 1st to 3rd.

The seasonal trough was active over south Bay from 6th and a well marked low pressure area developed at its western end over southwest Bay off Tamil Nadu-Sri Lanka coasts on 8th, and persisted there till 10th. It later moved westwards across Sri Lanka and adjoining Comorin area and extreme south Peninsula to Maldive-Lakshadweep area by 12th. It moved further to the west of Lakshadweep on 13th morning. A well marked trough of low also lay off Goa-Karnataka-north Kerala coasts and Lakshadweep from 6th to 11th. The seasonal trough of low lay in southwest Bay off Tamil Nadu-Sri Lanka coasts from 12th to 14th and became less marked later. In association with these systems, rain or thundershowers were fairly widespread in south Peninsula and Lakshadweep on many days in the second week. They were scattered or isolated in Maharashtra and Andhra Pradesh on a few days between 10th and 14th. A few heavy falls were also reported from Tamil Nadu on a number of days and from Kerala on a few days during the second week.

An upper air cyclonic circulation which lay over south Rajasthan and adjoining Gujarat State extending upto 1·5 km a.s.l. on 16th, gave isolated rain or thundershowers in Gujarat State on 17th and in Rajasthan and west Madhya Pradesh on 18th.

A trough of low lay in southwest and adjoining west central Bay off Sri Lanka-Tamil Nadu-south Andhra coasts between 18th and 20th and was marked on 19th. An upper air cyclonic circulation extending upto 4·5 km developed over the south Peninsula on 19th and moved into Lakshadweep by 20th. Under its influence, a well marked low pressure area formed over southeast Arabian Sea to the west of Lakshadweep by 20th evening, moved northwards to off north Maharashtra coast on 22nd morning and weakened into a trough off north Maharashtra coast the next day. A trough from this system extended northeastwards to south Rajasthan and adjoining west Madhya Pradesh between 21st and 23rd. In association with these systems, rain or thundershowers were generally widespread with a few heavy to very heavy falls in coastal Andhra Pradesh, Tami-Nadu and Kerala from 19th to 22nd. Rainfall was also generally widespread in coastal Karnataka from 20th to 23rd, in Lakshadweep on 21st and 22nd, in interior Maharashtra on 21st and 22nd, in Konkan and Gujarat State from 21st to 24th, in east Rajasthan from 22nd to 24th and in west Madhya Pradesh on 22nd. Isolated heavy rain also occurred in Maharashtra, Gujarat, west Madhya Pradesh and east Rajasthan on one or two days.

A low pressure area lay in east central Arabian Sea from 24th to 26th with a trough extending northeastwards to south Rajasthan. It weakened on 27th and lay as a trough off Karnataka-Kerala coast on the subsequent days of the month. An upper air cyclonic circulation lay over Sri Lanka and adjoining Tamil Nadu in lower tropospheric levels on 28th and 29th and moved away westwards by 1 December. In association with these systems, rain or thundershowers were generally widespread in Kerala on 27th and 28th and in Lakshadweep on 27th. They were scattered or isolated in Rajasthan on 25th and 26th, in Gujarat State on 25th, in Tamil Nadu from 28th to 30th, in Karnataka State from 25th to 27th and in Kerala on 25th, 26th, 29th and 30th.

A trough of low which lay over south Andaman Sea and adjoining southeast Bay between 18th and 20th gave scattered or fairly widespread rain or thundershowers in Bay Islands between 18th and 21st with one or two heavy falls on 18th and 21st.

In association with low level cyclonic circulations moving across Assam & adjacent States, Sub-Himalayan West Bengal and Sikkim between 14th and 17th and 26th and 30th, scattered or isolated rainfall occurred over these areas on some days during the above periods.

The principal amounts of heavy rainfall over the country associated with the above mentioned systems were :

Date	*Station*	*Rainfall (cm)*
5	Masulipatnam	27
	Rajahmundry	17
	Nidadavolu	15
	Bhimavaram	15
	Waltair	15
	Tadepalligudam	15
	Polavaram	14
	Rampachodavaram	13
	Koderu	13
8	Ponnani	12
	Srivalliputtur	11
	Tirurangadi	11
	Kuttiyadi	10
	Malaylattur	10
9	Palghat	11
11	Sulurpet	13
12	Adirampattinam	11
	Madurantakam	10
	Cuddalore	10
18	Bapatla	18
	Avanigadda	15
	Tuticorin	11
	Kakinada	10
19	Calicut	14
	Thanjavur	13
	Ongole	10

Date	Station	Rainfall (cm)
20	Ongole	11
	Perintalamanna	11
	Irinjalakuda	10
	Mannarghat	10
21	Kondul	10
	Ongole	10
22	Car Nicobar	24
	Nancowry	16
22	Kondul	11
23	Kondul	20
	Nimach	10
24	Nimach	10
	Dharapuram	10
25	Madras City	45
	Madras Airport	35
	Sriperumbudur	27
	Sulurpet	23
	Rapur	18
	Nellore	18
	Tirupathi	17
	Kanchipuram	17
	Vellore	14
	Tiruttani	13
26	Nellore	22
	Amalapuram	21
	Waltair	20
	Narsapur	17
	Kakinada	15
	Kodern	14
	Visakhapatnam	13
	Peddapuram	13
	Nidadavolu	12
	Masulipatnam	12
27	Chintalapudi	16
	Kakinada	14
	Amalapuram	13
	Koderu	11
	Waltair	11
	Silchar Airport	10
28	Sandheads	17
30	Palayankottai	11

Four western disturbances moved across the Western Himalayas as upper air cyclonic circulation/troughs in the lower and middle troposphere, two in the first fortnight and two in the second fortnight. However, these systems did not cause any precipitation. The total rainfall in the Western Himalayas during the whole month was about 0·2 mm only. An induced low moved from south Pakistan and adjoining west Rajasthan to the hills of west Uttar Pradesh across northwest Rajasthan and Haryana between 11th and 14th and gave isolated rain or thundershowers in plains of west Uttar Pradesh on 13th and in east Rajasthan on 13th and 14th. Bhilwara recorded 1 cm of rain on 13th and Udaipur 2 cm on 14th.

Due to the influx of moisture brought in by the passage of successive systems from the Bay, night temperatures were appreciably to markedly above normal over many parts of Orissa, Madhya Pradesh, Rajasthan, Gujarat and Maharashtra State and Telanagna on most days in the month. They were also appreciably above normal over most parts of Assam and adjacent States between 26th and 29th.

DECEMBER

A trough of low pressure which moved from Andaman Sea into southeast Bay between 24th and 26th, concentrated into a depression by 28th evening with its centre near 8·0°N, 89·0°E. Moving northeastwards, it intensified into a severe cyclonic storm by 30th evening with its centre near 10·0°N, 92·0°E. Continuing to move northeast, it weakened into a cyclonic storm during the night of 31st and was centred about 150 km northeast of Port Blair on morning of 1 January. It remained near about that area till that night and weakened further into a depression. Later it moved west and then northwards and lay as a low over east central Bay and adjoining north Andaman Sea by 3rd evening. In association with this system, rainfall was generally widespread over Bay Islands from 27 December to 2 January with some very heavy falls on 30th and 31st. Port Blair and Long Island recorded 37 and 32 cm of rain respectively on 31 December 1976. According to preliminary reports, strong winds and very heavy rain caused widespread damage in Little Andaman, and South Andaman, particularly in Neil and Havelock Islands. A large number of trees were uprooted and roofs of houses blown off in these areas. Considerable damage to fruit orchards, vegetable gardens and crops in the fields was reported. A few lives were also lost.

Eight western disturbances moved eastwards across northwest India as upper air cyclonic circulations or troughs, 4 each in the first and second fortnights. In association with the first disturbance and an induced low which moved eastnortheastwards from central parts of west Rajasthan to the hills of west Uttar Pradesh between 2nd and 4th, scattered or isolated rain or thundershowers occurred in plains of west Uttar Pradesh, Jammu & Kashmir and Himachal Pradesh on 3rd. The last two western disturbances moved across Western Himalayas between 24th and 30th. An induced low also moved from Rajasthan to south Uttar Pradesh and adjoining north Madhya Pradesh between 24th and 26th and dissipated there on 26th evening. Under the influence of these systems, rain or snow was generally widespread in Jammu & Kashmir on 26th and 27th and isolated on 25th, 28th and 29th and scattered in Himachal Pradesh on 26th and in the hills of west Uttar

Pradesh on 26th and 31st. Scattered or isolated rainfall also occurred in Punjab, Haryana and the plains of Uttar Pradesh and in west Madhya Pradesh on 26th. According to press reports, Kashmir valley experienced heavy snowfall on 26th and air traffic to Srinagar was suspended on that day. The other western disturbances did not cause any precipitation in northwest India.

The seasonal trough of low pressure lay off Kerala-Karnataka coasts on many days in the first fortnight. Another trough of low which lay off Sri Lanka Taimil Nadu-south Andhra coasts, moved westwards across south Peninsula and merged with the trough off Kerala-Karnataka coast between 1st and 3rd. An upper air cyclonic circulation lay over Sri Lanka and adjoining Tamil Nadu coasts in lower tropospheric levels between 5th and 7th and became less marked later. A trough of low lay in southwest Bay off Sri Lanka-Tamil Nadu coasts between 9th and 14th. In association with the above systems, Tamil Nadu, Kerala and Lakshadweep received isolated or scattered rain or thundershowers on many days in the first fortnight. Rain or thundershowers were also scattered or isolated in Andhra Pradesh and Karnataka on a few days in the first week.

A trough extended from coastal Maharashtra to Madhya Pradesh from 6th to 8th and again on 11th and 12th. It caused isolated rain or thundershowers in Madhya Maharashtra on 7th and 8th and in Madhya Pradesh from 7th to 9th and again on 12th.

The seasonal trough lay over Lakshadweep and off Kerala coast from 21st to 26th and was well marked on the first two days, causing isolated light rainfall in Kerala and Lakshadweep between 22nd and 26th.

In association with the seasonal trough of low off Sri Lanka-Tamil Nadu coasts, generally scattered or isolated rain or thundershowers occurred in Tamil Nadu during the period 15th to 24th, with isolated heavy falls on a few days.

Bay Islands had three spells of scattered or isolated rainfall during the periods 1st to 4th, 10th to 14th and 18 to 20th.

The principal amounts of rainfall associated with the above mentioned systems during the month were :

Date	*Station*	*Rainfall (cm)*
1	Mayuram	9
2	Muvattapuzha	5
3	Kancheepuram	7
	Mettupalayam	6
	Kuttiyadi	5
5	Kunnamkulam	7
	Muvattapuzha	6
	Thodupuzha	5
7	Thodupuzha	7
	Muvattapuzha	5
12	Karaikal	9
	Nagapattinam	5
17	Karaikal	10
	Nagapattinam	8
19	Kondul	11
	Vedaranniyam	5
21	Cuddalore	7
	Pondicherry	5
22	Vedarnniyam	10
	Mayuram	7
	Mannargudi	5
23	Pondicherry	6
	Cuddalore	5
24	Vedaranniyam	8
26	Nancowry	6
27	Car Nicobar	8
29	Hut Bay	6
	Nancowry	5
30	Hut Bay	14
	Maya Bandar	13
	Port Blair	11
	Long Island	10
	Car Nicobar	6
31	Port Blair	37
	Long Island	32
	Kondul	15
	Hut Bay	9
	Maya Bandar	6

Night temperatures were generally below normal in northwest India and Uttar Pradesh between 6th and 22nd and in northeast India from 11th to 25th, being appreciably so in Rajasthan on 10th and 11th, in east Uttar Pradesh from 11th to 13th and in Bihar on 20th and 21st. They were above normal over the Peninsula and central parts of the country upto 23rd, being appreciably so over many parts of Madhya Pradesh, interior Maharashtra State, coastal Andhra Pradesh and Telangana between 2nd and 4th and appreciably to markedly above normal in Madhya Pradesh and adjoining interior Maharashtra State on 7th and 8th.