Mausam, (1993), 44, 2, 211-222

Weather

HOT WEATHER SEASON (MARCH-MAY 1992)*

1. Introduction

The normal seasonal rainfall during hot weather season over Andaman & Nicobar islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura and also over Kerala is of the order of 45 cm to 55 cm. Normal rainfall/snowfall during this season over hills of west Uttar Pradesh, Himachal Pradesh and Jammu & Kashmir ranges from 18 cm to 33 cm. However, the normal pre-monsoon rainfall varies between 10 cm and 19 cm over Gangetic West Bengal, Orissa, Bihar plateau, Tamil Nadu, coastal and south interior Karnataka and Lakshadweep. It is least in Gujarat which is less than 1 cm.

Monthwise synoptic features are given in Tables 1, 2 & 3 and monthly and seasonal rainfall figures in Table 4. Seasonal rainfall departures over the 35 meteorological sub-divisions are shown in Fig. 1.

2. Chief synoptic features

(*i*) A tropical storm (16-19 May) formed over central Bay and crossed Arakan coast on 19 morning and weakened over Myanmar on 28.

(*ii*) Heat wave conditions prevailed over Bihar plains, northwest India and in parts of central India during second and third week of May.

3. March

3.1. *Weather and associated synoptic features*

Northwest India was affected by 9 western disturbances and 7 induced cyclonic circulations during March. In addition 2 westerly troughs in mid and upper troposphere also moved across northwest India. Over south Tamil Nadu, coastal Orissa and Sub-Himalayan West Bengal & Sikkim a few low level cyclonic circulations were observed. Details of the synoptic systems in March are given in Table 1. Punjab, Himachal Pradesh and east Rajasthan and west Uttar Pradesh received well distributed rainfall during the last 10 days in association with western disturbance activity. Jammu & Kashmir also received widespread snowfall between 23rd and 26th.

Rain or thundershowers occurred either almost at all the places or at many places on 10 days in Jammu & Kashmir, on 5 days in Himachal Pradesh and on one to two days in Assam & Meghalaya, hills of west Uttar Pradesh, Nagaland, Manipur, Mizoram & Tripura and Punjab. Rain or thundershowers occurred either at one or two places or at a few places on 7 to 14 days in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Punjab, Himachal Pradesh, Nagaland, Manipur, Mizoram & Tripura and hills of west Uttar Pradesh, on 1 to 5 days in Rajasthan, Madhya Pradesh, plains of west Uttar Pradesh, Haryana, Chandigarh, Delhi, Jammu & Kashmir and north interior Karnataka. Weather was mainly dry over the rest of the country.

3.2. *Rainfall*

Month's rainfall was excess in 1, normal in 3, deficient in 3, and scanty in 8 sub-divisions. Mainly dry weather prevailed in 20 meteorological sub-divisions. Rainfall was excess in Jammu & Kashmir, normal in Arunachal Pradesh, Assam & Meghalaya and Himachal Pradesh and scanty or deficient in Nagaland, Manipur, Mizoram & Tripura, Punjab, Rajasthan, Sub-Himalayan West Bengal & Sikkim, west Uttar Pradesh, Haryana, Chandigarh and Delhi, Madhya Pradesh and north interior Karnataka. Mainly dry weather prevailed over the rest of the country. The significant amounts of rainfall (cm) are given in Table 5.

3.3. *Temperature*

Day temperatures were below normal to markedly below normal in Assam & Meghalaya, Arunachal Pradesh, Haryana, Chandigarh and Delhi, Punjab and Rajasthan during last fortnight and were so over Gujarat region, Saurashtra, Kutch & Diu and Konkan & Goa between first and eleventh of the month. They were above or appreciably above normal on most of the days in Andhra Pradesh, Tamil Nadu, Karnataka, Bihar, Orissa, Uttar Pradesh, Madhya Pradesh and Maharashtra outside Konkan & Goa.

The highest recorded maximum temperature in plains was 45° C (dep. +7° C) at Cuddapah on 20th and in hills it was 35° C (dep. +6° C) at Mahabaleshwar on 26 and 27.

Cold wave conditions prevailed over hills of west Uttar Pradesh and Jammu & Kashmir for 11 days and 5 days respectively. Night temperatures were generally below or appreciably below normal over the country outside Nagaland, Manipur, Mizoram & Tripura,

* Compiled by : U.S. De, D.S. Desai and C.S. Bais, Meteorological Office, Pune.

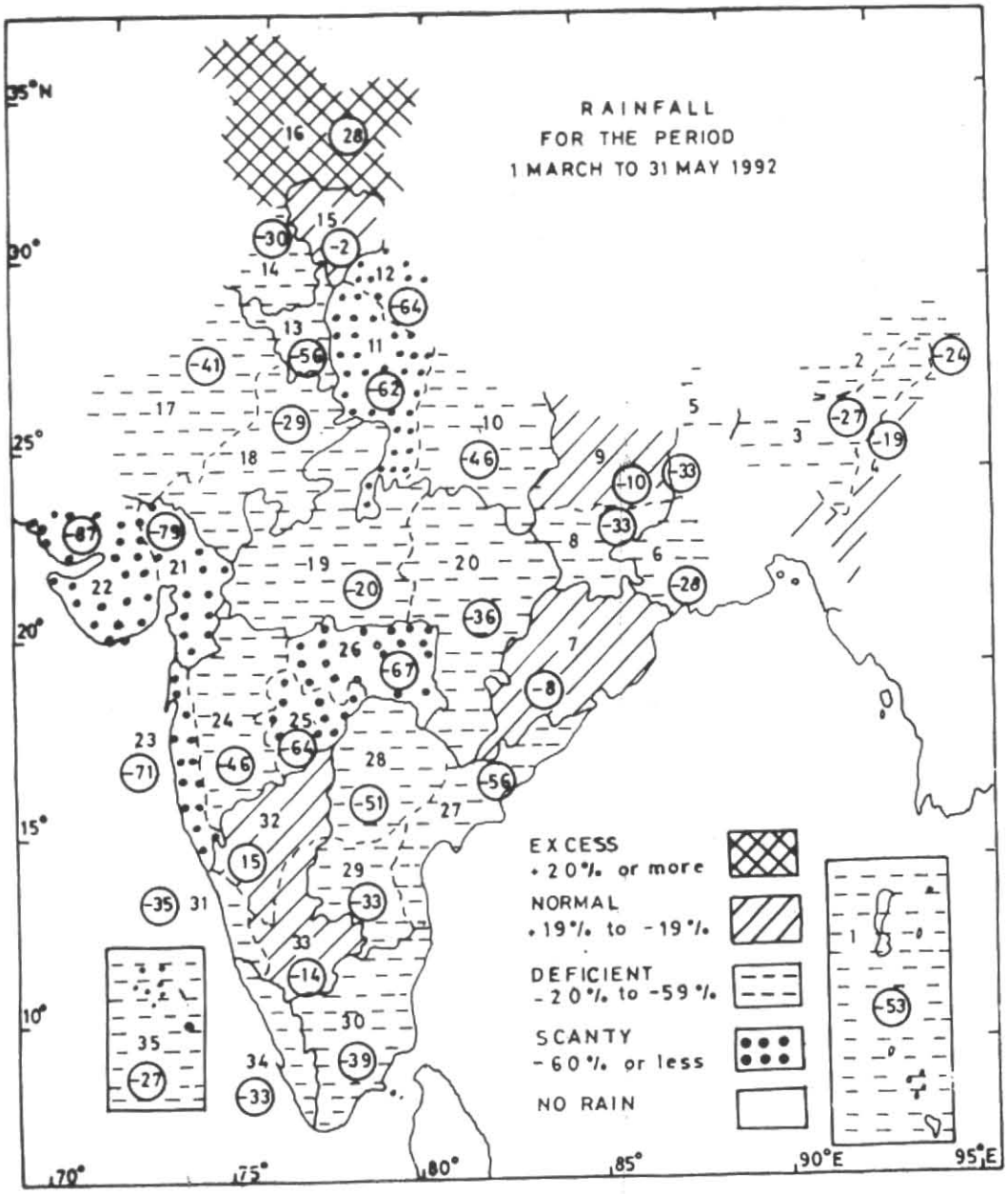

Fig. 1. Rainfall for the period 1 March to 31 May 1992 (percentage departure from normal)

TABLE 1

Details of weather systems during March 1992

	Weather system	Period	Place of first location	Direction of movement	Place of dissipation
	(A) *Western disturbance*				
(1)	Upper air system	4-7 Mar	North Pakistan	Northeastwards	Western Himalayas
(2)	Do.	10-13	North Pakistan and neighbourhood	Do.	Moved away
(3)	Do.	13-15	Do.	Do.	Do.
(4)	Do.	16-17	Do.	Do.	Do.
(5)	Do.	19-22	Do.	Do.	Across Jammu & Kashmir
(6)	Do.	22-25	Do.	Do.	Do.
(7)	Do.	25-27	Pakistan	Do.	Do.
(8)	Do.	28-30	Pakistan & adjoining parts of Afghanistan	Do.	Do.
(9)	Do.	30-1 Apr	North Pakistan and neighbourhood	Do.	Do.
	(B) *Induced cyclonic circulation*				
(1)	Lower levels	27 Feb-2 Mar	Northwest Rajasthan	Northnortheastwards	Northwest Rajasthan & adjoining Haryana—Punjab
2(a)	Do.	11-14	Punjab & adjoining parts of Pakistan	Northeastwards	Haryana and adjoining parts of Himachal Pradesh
2(b)	Remnant trough of lower level	14-19	Himachal Pradesh to west Madhya Pradesh	Eastwards	Sub-Himalayan West Bengal to north Bay
(3)	Lower trop. levels	19-22	West Rajasthan and neighbourhood	Northeastwards	Haryana and neighbourhood
(4)	Do.	22-23	Punjab and adjoining parts of north Pakistan	Eastwards	Punjab and neighbourhood
(5)	Do.	23-25	North Rajasthan	Northeastwards	Across Himachal Pradesh
(6)	Do.	26-27	Punjab and adjoining Pakistan	Do.	Do.
(7)	Lower levels	28-29	Southwest Rajasthan and neighbourhood	—	Less marked *in situ*
	(C) *Troughs in westerlies/easterlies*				
(1)	Trough in mid and upper trop. westerlies at 9.5 km asl	13-16	Along Long. 63°E north of Lat. 25°N	Eastwards	Northeast Afghanistan to north Arabian Sea
(2)	Eastwest trough	18-24	Sub Himalayan West Bengal to northeast Assam and neighbourhood	*In situ*	*In situ*
(3)	Trough in mid and upper trop. westerlies	28-2 Apr	60°E/north of 20°N	Eastwards	Sub Himalayan West Bengal to southeast Madhya Pradesh became less marked
(4)	Eastwest trough (lower levels)	28-30 Mar	Bihar plains to north Assam	*In situ*	*In situ*
(5)	North-south trough in lower level	29-31	Bihar plateau to Telangana	Do.	Do.

TABLE 1 (contd.)

	Weather system	Period	Place of first location	Direction of movement	Place of dissipation
	(D) *Other cyclonic circulations*				
(1)	Upto mid. trop. level	28 Feb-3 Mar	Sub-Himalayan West Bengal and neighbourhood	*In situ*	
(2)	Lower levels	4-6 Mar	Assam & adjacent States	Do.	
(3)	Do.	23 Feb-1 Mar	South Tamil Nadu	Westwards	Lakshadweep area and neighbourhood
(4)	Do.	2-6	Sri Lanka and adjoining south Tamil Nadu	Persisted over south Tamil Nadu and adjoining Kerala	Kerala and adjoining south Tamil Nadu
(5)	Do.	3-4	Off coastal Karnataka	*In situ*	—
(6)	Lower trop. levels	6-8	West Rajasthan and adjoining Kutch	Northwestwards	Southwest Rajasthan
(7)	Lower levels	8-14	Sub Himalayan West Bengal and neighbourhood	Eastward	—
(8)	Do.	10-11	Coastal Orissa	*In situ*	—
(9)	Do.	7-9	Lakshadweep area	Do.	—
(10)	Do.	9-12	Off south Tamil Nadu coast	Do.	—
(11)	Do.	18-19	Central parts of Rajasthan	Do.	—

TABLE 2

Details of weather systems during April 1992

	Weather system	Period	Place of first location	Direction of movement	Place of dissipation	Remark
	(A) *Western disturbance*					
(1)	Upper air system	3-6	East Afghanistan and adjoining Pakistan	Northeastwards	Moved away across Jammu & Kashmir	
(2)	Do.	5-8	West Pakistan and neighbourhood	Do.	Do.	
(3)	Do.	7 eve-12	West Pakistan and adjoining Afghanistan	Do.	Moved away across	
(4)	Do.	12-16	North Pakistan and neighbourhood	Eastnortheastwards	Moved away across Jammu & Kashmir and Himachal Pradesh	
(5)	Do.	17-20	Do.	Northeastwards	Across Jammu & Kashmir	
(6)	Do.	20-21	Northwest Afghanistan and neighbourhood	Do.	Moved away	
(7)	Do.	22 eve-24	North Pakistan and neighbourhood	Do.	Moved away	
(8)	Do.	28 Apr-2 May	Do.	Do.	Moved away across Jammu & Kashmir	

TABLE 2 (contd.)

Weather system	Period	Place of first location	Direction of movement	Place of dissipation	Remarks
(B) *Induced cyclonic circulation*					
(1) Lower level	3-4	Southwest Rajasthan & neighbourhood	*In situ*	Less marked	
(2) Lower trop. level	20-22	North Pakistan and adjoining parts of west Rajasthan	Do.	Do.	On 21st seen as induced low pressure area. Associated cyclonic circulation persisted over Jammu & Kashmir till 22 evening
(C) *Troughs in westerlies/easterlies*					
(1) Middle and upper trop. levels	8-18	54°E north of 25°N	Eastwards	Nepal to Bihar plateau	
(2) Do.	19-30	50°E north of 20°N	Do.	Moved away across India and Bangla-Desh	
(D) *Other cyclonic circulations*					
(1) Lower levels	2-3	West Madhya Pradesh & adjoining southeast Rajasthan	*In situ*	Less marked	
(E) *Other troughs*					
(1) Lower trop. level	3-	West Madhya Pradesh to interior Karnataka	Eastwards	Marathwada to south Tamil Nadu	North coastal Orissa to north coastal Tamil Nadu through coastal Andhra Pradesh on 8
(2) Eastwest (lower level)	4-12	Bihar to northeast Assam	*In situ*	—	Marathwada to south Tamil Nadu through interior Karnataka on 15, persisted there till 22
(3) Lower trop. level	18-22	Sub-Himalayan West Bengal to north Bay	Do.	—	Embedded cyclonic circulation over Bangla Desh and neighbourhood on 21/22
(4) North-south trough (lower levels)	22 eve	Eastwest Uttar Pradesh to north interior Karnataka	Do.		
(5) Lower level (easterly)	29-1 May	South Kerala coast to Karnataka coast			

TABLE 3

Details of weather systems during May 1992

Weather system	Period	Place of first location	Direction of movement	Place of dissipation	Remarks
(A) *Cyclonic storm*					
(1) Cyclonic storm	15-20	Southwest and adjoining southeast Bay	Northeast to north-northeastwards	Moved away across Myanmar	Low pressure area (11.5°N/87.5°E) on 15; cyclonic storm (15° N/88.5° E) on 18; crossed Arakan coast on 19 noon; depression 19 eve-20th weakened further

TABLE 3 (contd.)

Weather system	Period	Place of first location	Direction of movement	Place of dissipation	Remarks
(B) *Western disturbance*					
(1) Upper air system	2 eve-6 eve	North Pakistan and neighbourhood	Northeastwards	Moved away across Jammu & Kashmir	
(2) Lower trop. level	4-6	Northwest Rajasthan & adjoining parts of Punjab and Pakistan	*In situ*	Less marked	
(3) Upper air system	13-15	North Pakistan and adjoining part of Afghanistan	Do.	Do.	
(4) Do.	16-18	North Pakistan & adjoining Jammu & Kashmir	Northeastwards	Moved away across Jammu & Kashmir	
(5) Do.	28-31	North Pakistan & neighbourhood	Do.	Do.	
(C) *Induced cyclonic circulation*					
(1) Lower trop. level	30 Apr-2 eve May	West Rajasthan and neighbourhood	Do.	Less marked Himachal Pradesh & neighbourhood	Associated with western disturbance over north Pakistan moving eastwards during 28 April-2 May
(2) Low level	13-15	Central parts of Rajasthan	*In situ*	Less marked	
(D) *Trough in westerlies*					
(1) Mid. trop. level	20	East Uttar Pradesh to south Tamil Nadu	—	—	
(2) Do.	30-31	Northern parts of Jammu & Kashmir to Arabian Sea		Less marked	
(E) *Other cyclonic circulations/ troughs*					
(1) Low trop. level	4-6	East Madhya Pradesh & neighbourhood	Eastwards	Bihar and neighbourhood	
(2) Do.	7-10	South Maharashtra coast	Do.	South Madhya Maharashtra	
(3) Do.	12-15	Sri Lanka & adjoining parts of Tamil Nadu	*In situ*	—	
(4) Co.	9-11	Northwest Rajasthan	Do.	—	
(5) Upper air cyclonic circulation (Mid trop. level)	26-28	Northwest Rajasthan & neighbourhood	Eastwards	West Uttar Pradesh & neighbourhood	
(6) North-south trough (lower level)	22 eve Apr-13eve May	East Uttar Pradesh to north interior Karnataka	Do.		
(7) Lower level	11-13	Andaman Sea	*In situ*	Less marked	
(8) Eastwest trough (Lower trop. level)	8-20 eve	Bihar plains to northeast Assam	Do.	Do.	
(9) Trough of low	16-21	Southeast & adjoining parts of east central Arabian Sea	Eastwards	Do.	More marked for a day; persisted as trough from southwest Bay off north Tamil Nadu coast to Comorin area

TABLE 3(contd.)

Weather system	Period	Place of first location	Direction of movement	Place of dissipation	Remarks
(10) Low trop. level	21	North west Rajasthan to northwest Bay across north Madhya Pradesh	—	—	Embedded cyclonic circulation persisted 21-24; another embedded cyclonic circulation (LTL) northwest Madhya Pradesh and neighbourhood 22-26
(11) North-south trough	25	South Madhya Pradesh to south Kerala	Eastwards	—	
(F) *Ridge line*					
(1) Mid and upper trop. level	21-27	Central Arabian Sea to Central Bay of Bengal	*In situ*	Weakened slightly on 27	Associated with two anticyclones, one over central Arabian Sea and the other over central Bay of Bengal

Gangetic West Bengal, Orissa, Rajasthan, Madhya Pradesh and Gujarat region where they were above normal. Amritsar recorded the lowest night temperature of 5° C (dep. —4° C) on 2nd and 3rd in the plains while Srinagar in the hills recorded 0° C (dep. —4° C) on 16, 20, 24 and 26.

3.4. *Disastrous weather events and damages*

As per media report duststorm on 15th affected the normal life in Guwahati city and in many parts of the Assam State. A school building and many houses were damaged in several villages of Lakhimpur district due to hailstorm on 15th. 130 families became landless due to erosion by *Brahmaputra* and *Lohit* rivers in Lakhimpur district. Four members of a family were burnt alive due to house collapse and subsequent fire from kerosene lamp due to the impact of thundersquall in south 24-Pargana. Over 30,000 persons in 49 villages of Tinsukia district were affected on 30th. The National Highway No. 52 was submerged disrupting direct road links between Assam and Arunachal Pradesh due to a breach in the embankment of the *Noa Dihing* river. One woman died and hundreds of birds perished due to severe hailstorm in Dholpur district of Rajasthan. Standing wheat crop was also damaged.

4. April

4.1. *Weather and associated synoptic features*

Trough/wind discontinuity was observed in the lower levels over the Peninsular and northeast India during the month. Two mid and upper tropospheric level westerly troughs and eight induced cyclonic circulations affected northwest India. Details of the synoptic features are given in Tables 1-3.

Rain/thundershowers occurred either almost at all the places or at many places on 1 to 4 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Orissa and Kerala. They occurred at a few places or at one or two places on 16 to 20 days in Arunachal Pradesh, Assam & Meghalaya, Orissa, Kerala and Tamil Nadu and on 10 to 14 days in Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim and Maharashtra State outside Konkan and on 5 to 8 days in Bay islands, Gangetic West Bengal and Andhra Pradesh and on 1-day in plains of west Uttar Pradesh and Lakshadweep. Mainly dry weather prevailed over the rest of the country.

4.2. *Rainfall*

Rainfall was excess in 1, normal in 5, deficient in 10 and scanty in 16 meteorological sub-divisions. There was no rainfall in 3 sub-divisions.

It was normal in Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura, Orissa and interior Karnataka, deficient in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, west Rajasthan, Madhya Pradesh, Madhya Maharashtra, Marathwada, Rayalaseema, Tamil Nadu and coastal Karnataka. Rainfall was scanty over rest of the country outside Gujarat region, Saurashtra, Kutch & Diu and Konkan & Goa where there was no rain.

The significant amounts of rainfall (cm) during the month are given in Table 5.

4.3. *Temperature*

Day temperatures were above or appreciably above normal on most of the days in central and Peninsular India. They were below normal or appreciably below normal in northern parts of India on most days.

4.4. *Disastrous weather events and damages*

Hailstorm accompanied with squall caused extensive damages in some parts of Assam and Mizoram. As per reports many houses including two school buildings and one milk farm were completely damaged in Nalbari and Lakhimpur district of Assam. Hailstorm also uprooted number of trees breaking electric and telephone posts which disrupted power supply and communication channels. Five school children lost lives on the spot

TABLE 4

Monthly and seasonal rainfall (mm) during March to May 1992

Sub-divisions	March			April			May			Season		
	Actual	Normal	% Dep.	Actual	Normal	% Dep.	Actual	Normal	% Dep.	Actual	Normal	% Dep.
1 Bay Islands	0	40	—100	10	88	—88	226	377	—40	236	505	—53
2 Arunachal Pradesh	97	100	—3	177	173	2	182	324	—44	456	597	—24
3 Assam & Meghalaya	81	77	+5	124	185	—32	276	397	—31	481	660	—27
4 Naga., Mani., Mizo. & Trip.	33	65	—49	115	131	—13	205	235	—13	352	431	—19
5 S.H.W.B.& Sikkim	6	53	—89	69	109	—37	214	278	—23	288	430	—33
6 Gangetic West Bengal	0	26	—99	19	43	—56	102	99	+3	121	168	—28
7 Orissa	0	23	—99	28	31	—9	80	65	+24	108	118	—8
8 Bihar Plateau	1	20	—98	7	20	—66	54	52	+4	62	93	—33
9 Bihar Plains	0	11	—99	2	14	—85	59	44	+36	62	69	—10
10 East Uttar Pradesh	0	9	—98	0	6	—97	17	16	+3	17	32	—46
11 Plains of West U.P.	3	13	—80	1	7	—90	8	11	—27	12	31	—62
12 Hills of West U.P.	23	58	—61	4	32	—89	31	67	—55	57	158	—64
13 Har., Chandi. & Delhi	2	13	—88	2	7	—76	11	12	—8	14	32	—56
14 Punjab	18	25	—28	3	11	—70	13	13	+1	35	50	—30
15 Himachal Pradesh	96	79	+21	13	44	—71	60	49	+23	169	173	—2
16 Jammu & Kashmir	301	145	+107	94	113	—17	93	75	+25	427	333	+28
17 West Rajasthan	1	6	—80	1	3	—59	9	9	—2	10	17	—41
18 East Rajasthan	3	5	—50	0	3	—99	9	9	+1	12	17	—29
19 West Madhya Pradesh	0	7	—96	2	4	—44	13	8	+58	16	20	—20
20 East Madhya Pradesh	1	18	—92	10	13	—26	19	16	+22	30	46	—36
21 Gujarat Reg., Daman Dadra & Nagar Haveli	0	2	—100	0	1	—100	2	7	—72	2	10	—79
22 Saurashtra, Kutch & Diu	0	3	—100	0	1	—100	1	4	—74	1	8	—87
23 Konkan & Goa	0	0	—100	0	5	—100	14	42	—68	14	48	—71
24 Madhya Maharashtra	0	4	—100	5	12	—57	19	30	—35	25	46	—46
25 Marathwada	0	7	—99	5	10	—50	8	20	—59	13	36	—64
26 Vidarbha	0	18	—99	5	13	—60	9	14	—32	14	44	—67
27 Coastal Andhra Pradesh	0	12	—100	5	24	—80	38	56	—33	43	96	—56
28 Telangana	0	11	—99	6	20	—70	22	27	—16	28	57	—51
29 Rayalaseema	0	6	—100	11	21	—48	44	54	—18	55	81	—33
30 Tamil Nadu & Pondi.	0	21	—100	26	50	—48	60	71	—16	87	142	—39
31 Coastal Karnataka	0	9	—100	18	31	—43	100	140	—29	118	181	—35
32 N.I. Karnataka	0	4	—95	23	26	—13	67	48	+40	90	78	+15
33 S.I. Karnataka	0	9	—100	40	56	—13	98	95	+3	138	160	—14
34 Kerala	0	41	—99	45	114	—61	224	245	—9	269	400	—33
35 Lakshadweep	0	8	—100	5	35	—87	130	141	—8	135	184	—27

TABLE 5

Monthly rainfall amounts (cm)

Date	March 1992	April 1992	May 1992
1	Kailashahar 3		Chintapalli 5, Madurai & Tunni 4 each, Punalur 7, Visakhapatnam & Chaibasa 3 each
2	Kailashahar 3	Bhagamandala (SIK) 3	Lakhameshwara (NIK) 17, Burdawan 9, Guwahati, Shiggon (NIK), Balehonour (SIK) & Iddukki (Kerala) 3 each
3		Chintapalli 3	Guidyatham (T.N.), Nelamagals (Karnataka) & Neyyatinkara (Kerala) 4 each, Purnea 3
4			Silchar 7, Purnea 5, Dumka & Purulia 4 each, Kailashahar 3
5			Vaikam (Kerala) 11, Raipur 8, Terianaic-kenpayam 7, Talital (U.P.) & Punanaur (Rayalaseema) 6 each, Pivarom (Kerala) 5, Amritsar & Majbat 3 each
6	Kalpa 6	Kailashahar 4	Dhubri & Erode (T.N.) 6 each, Bhubaneswar & Dharmsala (coastal Karnataka) 4 each, Jagdalpur 3
7		Silchar & Gangtok 3 each	Kozka (Kerala) 9, Thuckalay (T.N.) 7, Gangtok & Radhapuram (T.N.) 6 each, Sikar & Kozhikode 5 each, Kailashahar 3
8		Agartala 4	Kondul, Kozhikode & Tadong 6 each, Thiru vannathapuram 5, Kottayam & Minicoy 4 each
9		Bantwal (coastal Karnataka) 3	Pakala (Kerala) & Thiruvananthapuram city 4 each
10			Mavelikara (Kerala) 5, Hanipad (Kerala) 4, Nilambur (Kerala) 3
11			Carnicobar & Ponnani (Kerala) 6 each, Agartala & Nilambur 4 each
12	Kalpa 15, Manali 4, Bharmour (HP) 3		Nedumangad (Kerala) 4
13	Chawari (HP) & Kalpa 6 each, Manali 5, Bilaspur & Tissa (HP) 3 each	Dibrugarh 3	Perlembaroar (Kerala) 10, Punalur 5, Sathankalam (T.N.) & Pamban 3 each
14	Kalpa 10, Baijnath (HP), Bhareri (HP), Nangal & Nawashahar(P) 4 each, Banjara & Berthin (HP) 3 each, Gharashankar & Kapurthala (Punjab) 4 each, Gohar & Manali (HP) 3 each	Dibrugarh 3	Karwar 6, Sriviliputur (Kerala) 5, Jalgaon 4, Udupi (Karnataka) 3
15	Gohar & Kahu (HP) 3 each		Mangalore 14, Banivel 10, Uppinangad (Karnataka) 9, Polachi (T.N.) & Puttur (Karnataka) 6 each, Kozhikode 5, Cochi 4

TABLE 5 (contd.)

Date	March 1992	April 1992	May 1992
16	Cherrapunji 6	Nilakottai (T.N.) 4, Titlagarh 3	Kailashahar 7, Hukkeri (NIK) 5, Chamrajnagar (SIK) & Tezpur 4 each
17		Periyakulam (T.N.) 8, Coonoor 7, Siddapur (SIK) 4, Holalkere (SIK) 3	Gangtok 17, Tadong 12, Kundapur (coastal Karnataka) 10, Cochi 5, Raichur 3
18		Yadgiri (NIK), Munnar (Kerala) & Non Cowry 4 each, Kunnamkulam (Kerala) 3	Silchar 11, Imphal & Kolar Gold Field 5 each, Panambur 4
19	Kailashahar 4, Silchar 3	Kailashahar 9, Palani (T.N.) 5, Methupatti (T.N.) 4	Alleppey & Punalur 11 each, Gangtok 10, Cochi & Tadong 8 each, Kottayam 7, Siddapur (SIK) 5
20	Dharmanagar (Trip.) 3	Uthagamandalam & Somavarpet (NIK) 4 each, Sringeri (NIK) & Kailashahar 3 each	Nagar coil (T.N.) 5, Chittorgarh 3
21	Cherrapunji 11, Narkatia (Assam) 4, Silchar 3		Tissa (H.P.) 5, Dibrugarh & North Lakhimpur 4 each, Majbat 3
22	Cherrapunji 22, Tissa (HP) 8, Chawari (HP) 3	Gangtok 3	Digha & Gangtok 3 each
23	Bhuntar & Karimganj (Assam) 4 each, Baijnath (HP), Dibrugarh & Kathaula (HP) 3 each	Karimganj 13, Saundatti (NIK) 5, Tezpur & Tadong 4 each, Dharmsala 3	Sandheads 23, Bhubaneswar & Balasore 3 each
24	Tissa (HP) 7, Bhuntar 5, Dharmsala 4, Dibrugarh 3	Scholavandam (T.N.) 9, Kozhikode 6, Kailashahar 4	Khammam 5, Podili (AP) 4, Madras 3
25	Cherrapunji 10, Manali & Silchar 4 each	Madurai & Gangaveshi (NIK) 9 each, Nilakottai (TN) 6, Bellary 3	Bankura 10, Redhills (T.N.) 9, Srivilliputtur & Supaul 6 each, Midnapur 4
26	Srinagar 7, Tissa (HP) 6, Jammu, Manali & Mandi 5 each, Kalpa 4, Gurdaspur (Punjab) 3	Venkatgiri 11, Chittoor 6, Tiruvallur & Sulur (TN) 5 each, Pallakad & Vedaranyam 4 each, Tirupati 3	Adampur (Punjab), Tezpur, Kolar Gold Field & Tiruvanur 7 each, Patna, Purulia & Ranchi 3 each
27	Tissa (HP) 3	Kalingpong 6, Cooch Behar 5, Durgapur & Shimoga 4 each, Punalur, Sriniketan, Thiruvananthapuram city 6 each, Nilambur & Tadong 3 each	Sandheads 7, Dibrugarh & Usilampatti (T.N.) 3 each
28		Thadapuzhe (Kerala) & Bankura 4 each, Rangia & Siddapur (SIK) 3 each	Mahboobnagar & Manvi (NIK) 8 each, Namakkal (T.N.) 6, Yelhanka 5, Bikram (Bihar) & Karad (Maharashtra) 4 each
29	Manali 3	Tarrikera (SIK) 5, Koida (AP) & Hirekerur (NIK) 3 each	Kadayamallur (T.N.) & Tiruvanmalai 5 each, Bayad (Gujarat) 4, Chintapur 3
30			Chandgad 12, Tadong 11, Thamanpatti 9, Aira (Maharashtra) & Gudiyabazar 8 each, Hukkeri (NIK) 7, NanCowri 6, Carnicobar & Shiggon (NIK) 5 each, Belgaum 4
31			Gangtok 6, Uppinagadi (coastal Karnataka) 4

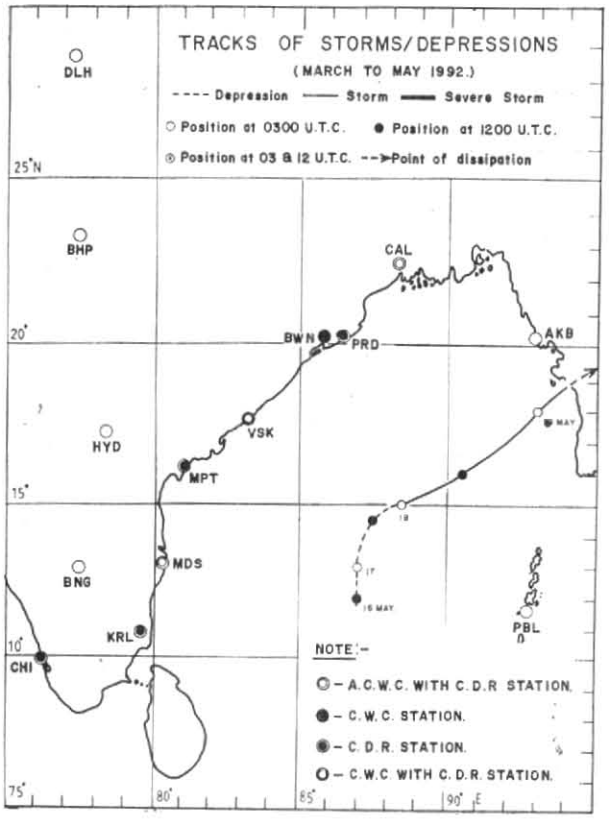

Fig. 2. Tracks of storm/depression during March to May 1992

and two were seriously injured due to severe lightning followed by storm with heavy rain in Panskura subdivision of Midnapur district of West Bengal. Many houses were washed away in the floods due to major breach in the embankment of *Noa-Dihing* and *Dhalandi* rivers following torrential rains which took a toll of eight human lives and several cattle heads. Damage to standing crop was also reported. A severe local storm with wind speed of 140 kmph and heavy rain killed 25 people in Nowgong district on 22. Traffic on the NH No. 36 and 37 were disrupted due to falling of trees at a number of places.

Rabi crops were damaged and pissiculture seriously affected due to saline inundation as a result of sudden breach in the embankment of river *Roymangal* resulting in flash flood in south 24-Pargana.

5. May

5.1. *Storms and depressions*

A tropical storm (16-19) formed over central Bay on 16 and crossed Arakan coast on 19 morning.

It formed as a well marked low pressure area over southwest and adjoining southeast Bay on 15 and concentrated into a depression on 16 morning near Lat. 11.5° N/Long. 87.5° E. Moving in a northerly direction, it intensified into a deep depression on 17. Further moving in a northeasterly direction, it intensified into a cyclonic storm centred at 0300 UTC of 18 near Lat. 15.0° N/Long. 88.5° E. It crossed Arakan coast in the noon of 19 and weakened into a depression over Myanmar coast the same evening. Its peak intensity was T 3.0 on Dvorak's scale at the time of estimated from satellite cloud imagery crossing the Myanmar coast on 19. The track of the system is shown in Fig. 2. No damage or significant weather was reported over India.

5.2. *Weather and associated synoptic features*

North-south trough in the lower levels was observed over Peninsular India during the first fortnight and last week of the month. An east-west trough in the lower levels was observed from Bihar plains to northeast Assam and from northwest Rajasthan to northwest Bay across Madhya Pradesh with embedded cyclonic circulations on most of the days of the month. Four western disturbances and 3 induced cyclonic circulations were affected north India.

Pre-monsoon thundershower activities occurred on most of the days during the month in Assam and adjoining States, West Bengal, Orissa, Vidarbha, Andhra Pradesh, Tamil Nadu, Kerala, Lakshadweep and Bay islands. Rain or thundershowers occurred either almost at all places or at many places on 10 to 12 day in Bay islands, Sub-Himalayan West Bengal & Sikkim and Kerala, on 5 to 6 days in West Bengal, Orissa and Lakshadweep and on 1 to 3 days in east Uttar Pradesh, hills of west Uttar Pradesh, Himachal Pradesh, west Rajasthan, Marathwada, Rayalaseema and Tamil Nadu. They occurred at a few places or at one or two places on 25 to 27 days in Vidarbha, coastal Andhra Pradesh, Telangana and Tamil Nadu and on 15 to 20 days in Andaman & Nicobar islands, West Bengal, Himachal Pradesh, east Rajasthan, Rayalaseema and Kerala and on 5 to 10 days in Uttar Pradesh, Punjab, Haryana, Chandigarh and Delhi, West Rajasthan, Konkan, Madhya Maharashtra, Marathwada and Lakshadweep.

5.3 *Rainfall*

Rainfall during the month was in excess in 6, normal, in 17, deficient in 9 and scanty in 3 sub-divisions.

Month's rainfall was excess in Orissa, Bihar plains, Himachal Pradesh, Madhya Pradesh and north interior Karnataka, normal in Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Bihar plateau, east Uttar Pradesh, Haryana, Chandigarh and Delhi, Punjab, Jammu & Kashmir, Rajasthan, Madhya Maharashtra, Vidarbha, Telangana, Rayalaseema, Tamil Nadu, south interior Karnataka, Kerala and Lakshadweep; scanty in Gujarat State and Konkan & Goa and deficient over rest of the country.

The significant amounts of rainfall (cm) are given in Table 5.

5.4. *Advance of southwest monsoon*

Southwest monsoon advanced into south Andaman sea and adjoining southeast Bay on 20. The southwest monsoon further advanced into some more parts of

southeast Bay and north Andaman sea on 23. It did not set in over the mainland of India till the last day of this month. The northern limit of monsoon passed through 5°N/86°E, 10°N/90°E, Maya Bandar and 15°N/98°E, on the last day of the month.

5.5. *Temperature*

Heat wave conditions prevailed over west Rajasthan for 4 days from 12 to 15 and in plains of west Uttar Pradesh and west Madhya Pradesh for 2 days during the same period. Heat wave conditions also prevailed for 1 to 2 days in Bihar plains, Himachal Pradesh and Vidarbha during the second and third week of the month. Day temperature were generally above normal over Peninsular India during the month. They were below normal over the central and northern parts during the month except between 10 and 20 where above normal temperatures prevailed. Highest day temperature of 47°C (dep. +5) recorded at Agra on 15 and at Bikaner and Anupgarh on 26 in the plains while Mahabaleshwar recorded highest day temperature of 37°C (dep.+7° C) over the hills on 1 and 3.

5.6. *Disastrous weather events and damages*

Four persons died in Rajasthan due to heat wave during the month. Dust storm accompanied with hail-storm took a toll of 3 children. Many buildings and dwelling houses were damaged due to squall in Jorhat, Kamrup and Nowgong district of Assam. A report from Dhubri town states that extensive damage worth Rs. 50 lakhs was caused due to severe storm on 17. A number of places in Himachal Pradesh experienced heavy rain accompanied with a squall disrupting power supply and telecommunication services.