

WEATHER IN PAKISTAN (January – March 2003)

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Introduction:

During the northeast monsoon season of 2003, eleven westerly low-pressure waves passed across the country. Winter rains commenced over the entire country about weeks later than the expected date.

The most significant weather spell occurred during the period from 16 to 21 in the month of February 2003. It was the wettest spell during the last three decades. Under the influence of related weather system, heavy to very heavy rains occurred almost at all the places in the northern parts of the country and at an isolated place in southern parts of Sindh. Apart from the above system, two strong weather systems influenced the northern parts of the country during first and last four days of March 2003. Under their influence, heavy to very heavy rains occurred at a number of places in northern parts of the country.

Foggy weather prevailed over Punjab and adjoining areas during a number of days in January and February 2003. In January, fog-phenomenon was the major factor causing disruption in road, train and air traveling activities. Under the influence of thick fog several train and road accidents occurred resulting in many casualties. Schedule of many domestic and international flights were affected due to poor visibility caused by thick fog.

Seasonal Rainfall (January – March):

Seasonal rainfall in 56 meteorological observing stations was in large excess in 20, moderate excess in 9, slight excess in 1, normal in 8, slight deficit in 6, moderate deficit in 7 and in large deficit in 5.

Rainfall was in large excess in Gupis, Gilgit, Bunji, Chilas, Kotli, Kakul, Kohat, Peshawar, Risalpur, Jhelum, Sialkot, Mianwali, Sargodha, Faisalabad, Shorekot (Rafiqui), Lahore (PBO), Lahore (A/P), Khanpur and Chhor, in moderate excess in Muzaffarabad, Garhi Dupatta, Drosh, Balakot, Chaklala, Murree, Bahawalnagar, Dalbandin and Badin, in slight excess in Parachinar. Normal in Chitral, Dir, Saidu Sharif, Cherat, Multan, Kalat, Jacobabad and Karachi (Airport), in slight deficit in D.I.Khan, Quetta, Zhob, Barkhan, Pasni and Moenjodaro, in moderate deficit in Skardu, Astor, Bahawalpur, Sibbi, Khuzdar, Jiwani, Padidan and it was in large deficit in Nokkundi, Panjgur, Rohri, Nawabshah and Karachi (Masroor). Seasonal station-wise percentage rainfall departures are given in Fig. 1 and percentage departures in Table 1. Whereas province-wise graphic representation of rainfall is given in Fig. 2

Monthly Features:

January 2003

Commencement of Northeast Monsoon Rains:

Northeast monsoon rains commenced over Balochistan on 18th and rest of the country on 26th January, about 17 days later than the expected date i.e.1 January.

Storm / Depression:

Nil

Weather and associated synoptic features:

Table 2 gives details of synoptic features for the month of January 2003.

A low formed over southeast Iran and adjoining areas on 15th morning, with its trough extending upto West Balochistan. The low persisted over there for three days and then moved east/southeastwards and lay over West Balochistan and adjoining areas on 18, system causing rains over Quetta and Makran division. A Western disturbance moved across the country during 26 to 31 and caused rains over Pakistan.

No heavy rainfall amount recorded in the month of January 2003

Monthly Rainfall:

Monthly rainfall was in large excess in 6, moderate excess in 2, normal in 4, slight deficit in 6, moderate deficit in 5 and large deficit in 33 Meteorological observing stations.

Rainfall was in large excess in Kohat, Pasni Dalbandin, Jiwani, Padidan and Chhor, moderate excess in Peshawar and Sargodha, normal in Jhelum, Moenjodaro, Karachi (Airport) and Karachi (Masroor), slight deficit in Risalpur, Cherat, Chaklala, Sibbi, Kalat and Khuzdar, moderate deficit in D.I.Khan, Mianwali, Shorekot (Rafiqui), Quetta, and Zhob, large deficit in Gupis, Gilgit, Skardu, Bunji, Chilas, Astor, Muzaffarabad, Garhi Dupatta, Kotli, Parachinar, Chitral, Dir, Drosh, Saidu Sharif, Kakul, Balakot, Murree, Sialkot, Faisalabad, Lahore(PBO), Lahore(A/P), Multan, Bahawalpur Bahawalnagar, Khanpur, Nokkundi, Barkhan, Panjgur, Jacobabad, Rohri, Nawabshah, Hyderabad, and Badin. The principal amounts of rainfall (mm) during the month are given in Table-5

TABLE 1

Station wise rainfall(mm) for each month and season as a whole (January -March 2003)

	January			February			March			Season		
	Actual (mm)	Normal (mm)	Dep % (mm)	Actual (mm)	Normal (mm)	Dep% (mm)	Actual (mm)	Normal (mm)	Dep% (mm)	Actual (mm)	Normal (mm)	Dep% (mm)
1	Gupis	0	5	-100	37	7	429	45	9	82	21	290
2	Gilgit	0	4	-100	33	6	450	19	13	52	23	126
3	Skardu	0	21	-100	20	24	-17	38	40	58	86	-32
4	Bunji	0	4	-100	47	6	683	28	16	75	26	188
5	Chilas	0	8	-100	74	13	469	35	30	109	51	114
6	Astor	2	35	-94	64	49	31	35	83	101	167	-39
7	Muzaffarabad	31	94	-67	357	135	164	179	157	567	386	47
8	Garhi Dupatta	29	96	-70	404	151	167	172	184	606	431	41
9	Kotli	27	76	-64	333	99	236	348	119	707	294	140
10	Parachinar	19	43	-56	138	74	86	117	121	274	238	15
11	Chitral	7	37	-81	103	63	63	103	107	213	207	3
12	Dir	25	111	-77	251	173	45	198	242	474	526	-10
13	Drosh	4	42	-90	104	68	53	174	113	282	223	26
14	Saidu Sharif	32	76	-58	217	103	111	140	180	389	359	8
15	Kakul	31	65	-52	282	114	147	199	142	511	321	59
16	Balakot	23	95	-76	324	153	112	227	187	575	435	32
17	Kohat	46	25	84	135	42	221	103	86	283	153	85
18	Peshawar	33	26	27	131	43	205	66	78	231	147	57
19	Risalpur	28	35	-20	173	53	226	91	80	292	168	74
20	Cherat	30	36	-17	66	67	-1	139	111	235	214	10
21	D.I.Khan	5	10	-50	35	17	106	8	35	48	62	-23
22	Chaklala	42	56	-25	173	73	137	110	90	325	219	48
23	Murree	48	127	-62	400	145	176	177	177	626	449	39
24	Jhelum	34	34	0	171	50	242	43	61	248	145	71
25	Sialkot	11	39	-72	165	44	275	71	55	247	138	79

26	Mianwali	15	24	-37	41	24	71	115	57	102	171	105	63
27	Sargodha	18	13	37	89	23	287	37	35	6	144	71	103
28	Faisalabad	0	11	-100	84	20	320	55	26	111	189	57	231
29	Shrekot	4	7	-43	61	12	408	44	25	76	109	44	148
30	Lahore(P.B.O)	1	23	-96	104	29	259	60	41	46	164	93	77
31	Lahore(A/P)	1	21	-95	124	29	327	57	43	33	183	93	96
32	Multan	3	7	-57	27	9	200	5	19	-74	35	35	0
33	Bahawalpur	0	6	-100	19	11	73	1	9	-89	20	26	-23
34	Bahawalnagar	0	4	-100	51	16	219	0	15	-100	51	35	46
35	Khanpur	0	4	-100	23	5	360	0	6	-100	23	15	53
36	Quetta	35	57	-39	95	49	94	10	55	-82	140	161	-13
37	Dalbandin	36	16	125	2	18	-89	35	19	84	73	53	38
38	Nokkundi	0	11	-100	3	8	-63	5	8	-37	8	27	-70
39	Zhob	11	18	-39	45	26	73	24	48	-50	80	92	-13
40	Barkhan	1	16	-94	6	21	-71	55	33	67	62	70	-11
41	Sibbi	6	7	-14	17	10	70	4	25	-84	27	42	-36
42	Kalat	21	24	-13	38	27	41	21	25	-16	80	76	5
43	Khuzdar	15	18	-17	15	24	-37	18	29	-38	48	71	-32
44	Panjgur	0	16	-100	8	16	-50	6	16	-63	14	48	-71
45	Pasni	45	19	137	0	19	-100	0	14	-100	45	52	-13
46	Jiwani	47	27	74	0	33	-100	0	10	-100	47	70	-33
47	Moenjodaro	0	0	0	4	5	-20	2	2	0	6	7	-14
48	Jacobabad	0	3	-100	19	7	171	2	10	-80	21	20	5
49	Rohri	0	3	-100	5	8	-37	0	6	-100	5	17	-71
50	Nawabshah	0	2	-100	0	2	-100	0	3	-100	0	7	-100
51	Padidan	3	1	200	3	5	-40	0	5	-100	6	11	-45
52	Hyderabad	0	1	-100	106	4	255	0	5	-100	106	10	960
53	Badin	0	1	-100	10	4	150	0	2	-100	10	7	43
54	Chhor	2	1	100	19	2	850	0	5	-100	21	8	163
55	Karachi(A/P)	6	6	0	22	10	120	0	12	-100	28	28	0
56	Karachi(Masroor)	4	4	0	1	6	-83	0	8	-100	5	18	-72

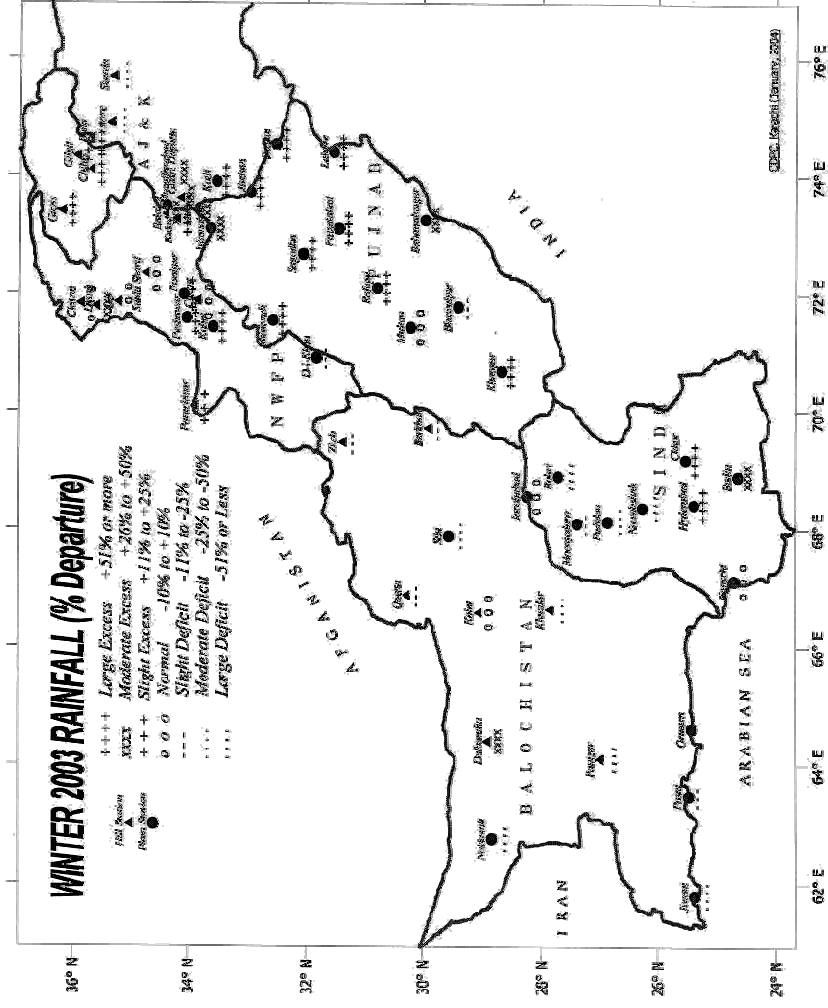


TABLE 2
Details of the weather systems during January 2003

S.No	System	Period	Place of the first location	Direction of Movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Low pressure area						
1	Low pressure area	17- 19	Southeast Iran and adjoining West Balochistan	Eastwards	Balochistan and adjoining areas	Became less-marked on 20
2	Do	18- 20	Upper NWFP	Eastwards	Kashmir	Became less marked on 21
3	Do	20-23	Do	Do	South Punjab and adjoining areas	Became less-marked on 24
4	Do	24-27	Balochistan and adjoining areas	Southeastwards	Southeast Sindh	Moved away eastwards
5	Do	28-31	Do	Eastwards	Eastern Sindh and adjoining northwest Rajasthan	Became less-marked on 1 Feb.

Western disturbances/eastward moving systems

1	Low pressure area	1-4	Southeast Iran and adjoining areas	Eastwards	Upper NWFP and adjoining Kashmir	Moved away east northeastwards on 5
2	Mid tropospheric level	5-8	Southeast Iran and adjoining Balochistan	Northeastwards	Kashmir and adjoining areas	Moved away northeastwards on 9
3	Low pressure area	28-31	North Punjab and adjoining areas	Northeastwards	Kashmir and adjoining areas	Moved away northeastwards on 1 Feb.

Temperature

Cold wave conditions prevailed on 10 days in FATA and on 1 day each in some parts of Hazara and Lahore divisions. Night temperatures were appreciably to markedly below normal on 10 to 12 days in some parts of FATA and Mirpurkhas division, on 4 to 7 days in Malakand, D.I.Khan and Rawalpindi divisions and on 1 to 2 days in Peshawar, Hazara, Gujranwala, Sargodha, Faisalabad, Multan, Mekran and Hyderabad divisions. They were appreciably to markedly above normal on 6 to 9 days in some parts of Peshawar, Multan, Quetta, and Mekran divisions, on 3 to 5 days in Lahore, Rawalpindi, Sargodha, Faisalabad, Sukkur, Larkana, Karachi and Hyderabad divisions and on 1 to 2 days in D.I.Khan, Malakand, Hazara, Bahawalpur, Mirpurkhas, and Sibbi divisions. They were considerably above normal on 1 to 3 days in some parts of Bahawalpur, Sibbi, Mekran, Mirpurkhas, Karachi and Hyderabad divisions. They were generally normal or slightly below to above normal over the rest of the country on the remaining days.

The month's lowest minimum temperature in the plains of the country was -1.5°C recorded at Kamra (Rawalpindi division) on 11 January 2003.

Day temperatures were considerably above normal on 3 to 6 days in some parts of Malakand and Hazara divisions, on 1 day each in Drosh, Rawalpindi, Gujranwala, Quetta, and Zhob divisions. They were appreciably to markedly above normal on 10 to 16 days in some parts of FATA, Malakand, Hazara, Peshawar, Zhob, Mekran, Quetta, Sibbi and Sukkur, divisions, on 5 to 9 days in Rawalpindi, Karachi, Larkana and Hyderabad divisions and 1 to 4 days in D.I.Khan, Gujranwala, Bahawalpur and Mirpurkhas divisions. They were appreciably to markedly below normal on 8 to 12 days in some parts of Rawalpindi, Gujranwala, Lahore and Faisalabad divisions, on 4 to 6 days in D.I.Khan, Sargodha and Multan divisions, on 1 to 3 days in FATA, Hazara, Peshawar, Sialkot, Jhelum, Bahawalpur, Zhob, Sukkur and Hyderabad divisions.

They were considerably below normal on 4 to 6 days in Gujranwala, Faisalabad, Lahore, and Sargodha, divisions, on 1 to 3 days in Sialkot, D.I.Khan, Rawalpindi, Multan, Malakand and Kohat divisions. They were generally normal to slightly above to below normal over the rest of the country on the remaining days.

The month's highest maximum temperature in the plains of the country was 32.50°C recorded at Lasbella (Kalat division) and Chhor (Mirpurkhas division) on 24 January 2003.

Disastrous weather events and associated damage

No such major report appeared in the national press during this month.

February 2003

Storm/depressions

Nil.

Weather and associated synoptic features:-

Details of synoptic features for the month of February 2003 are given in Table 3.

Under the influences of low-pressure areas over northern parts of Pakistan on 1 & 2 and again on 7 & 8, a good amount of rain occurred over the NWFP, northern areas of the Punjab and Kashmir. A low-pressure system formed over southeast Iran on 14 with its trough extending to West Balochistan. Next day system moved east/southeastwards and located as a well-marked low-pressure area over Balochistan and neighborhood. This occurred under the influence of a deep westerly trough developed over mid tropospheric level. The system moved slowly across the country during the period from 17 to 19 and caused heavy to very heavy rains in various divisions of Pakistan.

Principal amounts of rainfall (mm) are: -

17 Feb	Garhi Dupatta 61, Quetta 54, Malam Jabba 52, Muzaffarabad 49, Peshawar & Murree 46 each and Kamra 44.
18 Feb	Malam Jabba 140, Kamra 132, Murree 122, Muzaffarabad 114, Balakot 113, Kakul 104, Saidu Sharif 99, Dir 98, Risalpur 85, Hyderabad 71, Mandi Bahauddin 67, Drosh 59, Kotli & Jhelum 56 each, Peshawar 55 and Kohat 45.
19 Feb	Murree 121, Muzaffarabad and Jhelum 93 each, Kakul 89, Balakot 84, Sialkot 83, Malam Jabba 72, Mandi Bahauddin 65, Lahore (A/P) 63 and Lahore (PBO) and Kalam 56 each and Islamabad 55.

A westerly low-pressure area continued to persist over northern parts of the country during the period from 23 to 28 and caused rains in the NWFP, Punjab and Kashmir.

Monthly rainfall

Monthly rainfall was in large excess in 39, moderate excess in 3, normal in 1, slight deficit in 2, moderate deficit in 4 and large deficit in 7 Meteorological observing stations.

Rainfall was in large excess in Gupis, Gilgit, Bunji, Chilas, Muzaffarabad, Garhi Dupatta, Kotli, Parachinar, Chitral, Drosh, Saidu Sharif, Kakul, Balakot, Kohat, Peshawar, Risalpur, D.I.Khan, Chaklala, Murree, Jhelum, Sialkot, Mianwali, Sargodha, Faisalabad, Shorekot (Rafiqui), Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Zhob, Sibbi, Jacobabad, Hyderabad, Badin, Chhor, and Karachi (Airport), moderate excess in Astor, Dir and Kalat, normal in Cherat, Slight deficit in Skardu and Moenjodaro, moderate deficit in Khuzdar, Panjgur, Rohri and Padidan, large deficit in Dalbandin, Nokkundi, Barkhan, Pasni, Jiwani, Nawabshah and Karachi(Masroor). The significant amounts of

rainfall (mm) during the month are given in Table 5.

Temperature

Cold wave condition prevailed on 2 days in FATA and on 1 day in

Faisalabad division. Night temperatures were appreciably to markedly below normal on 6 to 8 days in some parts of FATA, Hazara and Rawalpindi divisions and on 1 to 3 days in D.I.Khan, Gujranwala, Quetta, Sukkur, Hyderabad and Mirpurkhas divisions. They were appreciably to markedly above normal on 9 to 13 days in some parts of Lahore, Bahawalpur, Multan, Sukkur, Larkana, Hyderabad, Karachi, Quetta and Mekran divisions, on 5 to 8 days in some parts of Rawalpindi, Faisalabad, Sibbi and Mirpurkhas divisions and on 1 to 2 days in FATA, Peshawar, Sargodha and Gujranwala divisions. They were considerably above normal on 4 to 6 days in Quetta, Mekran and Karachi divisions and on 1 day each on Rawalpindi, Hyderabad and Mirpurkhas divisions. They were generally normal or slightly below to above normal over the rest of the counter on the remaining days.

The month's lowest minimum temperature in the plains of the country was 0.30 C recorded at Nokkundi (Quetta division) on 19 February 2003.

Day temperatures were considerably above normal on 2 to 4 days in Bahawalpur, Sukkur, Larkana and Sibbi divisions, on 1 day each on Malakand, Quetta, Zhob, Mekran, Hyderabad and Mirpurkhas divisions. They were appreciably to markedly above normal on 15 to 18 days in some parts of

Quetta and Mekran divisions, on 7 to 9 days in Peshawar, Rawalpindi, Faisalabad, Zhob and Mirpurkhas divisions, on 4 to 6 days in Malakand, Hazara, D.I.Khan, Gujranwala, Sargodha, Multan, Sukkur, Sibbi, Karachi and Hyderabad divisions, on 1 to 3 days in FATA, Lahore, Bahawalpur and Larkana divisions. They were appreciably to markedly below normal on 4 to 7 days in some parts of Hazara, Rawalpindi, Bahawalpur, Multan, Sibbi, Sukkur and Hyderabad divisions, on 1 to 2 days in Fata, Malakand, Peshawar, D.I.Khan, Lahore, Sargodha, Gujranwala, Faisalabad, Quetta, Mekran, Larkana, Mirpurkhas and Karachi divisions. They were considerably below normal on 2 to 3 days in some parts of Hazara and Rawalpindi divisions, on 1 day each in FATA, Peshawar, D.I.Khan Gujranwala, Bahawalpur, Multan, Quetta, Mekran, Larkana, Sukkur and Mirpurkhas divisions.

The month's highest maximum temperature in the plains of country was 38.50C recorded at Padidan (Sukkur division) on 28 February 2003.

TABLE 3
Details of the weather system during February 2003

S. No	System	Period	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Low pressure area						
1	Low pressure area	1-2	NWFP and adjoining areas	Eastwards	Kashmir	Moved away eastwards on 3
2	Do	6-7	North Balochistan and adjoining areas	Southeastwards	South Punjab and adjoining areas	Became less-marked on 8
3	Do	22-28	Southeast Iran and adjoining West Balochistan	Eastwards	Eastern Sindh	Moved away southeastwards on 1 March
4	Do	24-28	Punjab and adjoining areas	Northeastwards	Kashmir	Moved away northeastwards on 1 March
Western disturbances/eastward moving systems						
1	Low pressure area with induced cyclonic circulation upto mid-tropospheric level	14-21	Southeast Iran and adjoining West Balochistan	Initially East/southeastwards and then northeastwards	Kashmir	Moved away northeastwards on 22

Disastrous weather events and associated damage

According to press reports, torrential rain and heavy snowfall over hills claimed 22 lives and left more than 70 persons injured in different parts of the country. A number of buildings and several poultry farms were also damaged badly due to the effect of violent windstorm near Karachi.

March 2003:

Storm / Depression

Nil.

Weather and Associated Synoptic Features:-

Table 4 gives the details of synoptic features for the month of March 2003.

A low-pressure area formed over Balochistan on 1 caused some rains over there and moved to South Punjab on 2. Another low formed over Kashmir on 1 with its trough extending to northern areas of the Punjab and neighborhood. These systems were extended upto mid tropospheric level. Heavy to very heavy rain occurred at many places in Kashmir, northern areas of the Punjab and at a few places in the upper NWFP on 2 and at isolated place in Kashmir on 3.

Principle amounts of rainfall (mm) are:-

2 Mar Kotli 168, Mianwali 93, Murree 84, Chaklala 76, Islamabad 72, Kamra 65, Balakot 55, Garhi Dupatta 53, Muzaffarabad 51, Kakul 48 and Barkhan 44.

3 Mar Kotli 68

A low pressure area formed over the NWFP and adjoining areas on 9 which next day moved eastwards and lay over Kashmir and adjoining northern areas of the Punjab and persisted over there for two days and caused rains at many places in Kashmir, Upper NWFP, at a few places in sub montane areas of the Punjab and at an isolated place in northeast Balochistan. Two westerly low-pressure systems persisted over the NWFP and adjoining Kashmir from 14 to 16 and 22 to 26. Systems caused rains at many places in the Upper NWFP, Kashmir and at few places in northern areas of the Punjab. During the period 22 to 26, a low was formed over East Iran on 22, after two days it moved to southeastwards and lay over Balochistan, it then slowly moved across southern

areas of the Punjab and adjoining Upper Sindh on 25, caused rains at a few places in Balochistan and Upper Sindh. A low was located North of Afghanistan on 27, next day it moved eastwards and lay over the Upper NWFP, its trough was extended southwards and became well marked under the influence of a deep westerly trough extended upto mid-tropospheric level. The system persisted over there for 5 days and then moved eastwards. Widespread rains occurred in Kashmir, NWFP and Punjab and at few places in Balochistan and Sindh.

Principal amounts of rainfall (mm) are: -

29 Mar Cherat 90, Kalam 75, Malam Jabba & Kakul 73 each, Balakot 64, Muzaffarabad 62, Garhi Dupatta 56, Saidu Sharif 54 and Risalpur 52.

Monthly rainfall

Monthly rainfall was in large excess in 9, moderate excess in 5, slight excess in 7, normal in 7, slight deficit in 4, moderate deficit in 4 and large deficit in 20.

Rainfall was in large excess in Gupis, Bunji, Kotli, Drosh, Mianwali, Faisalabad, Shorekot (Rafiqui), Dalbandin, and Barkhan, moderate excess in Gilgit, Kakul, Sialkot, Lahore (PBO) and Lahore (A/P), slight excess in Chilas, Muzaffarabad, Balakot, Kohat, Risalpur, Cherat and Chaklala, normal in Skardu, Garhi Dupatta, Parachinar, Chitral, Murree, Sargodha and Moenjodaro, slight deficit in Dir, Peshawar, Saidu Sharif and Kalat, moderate deficit in Jhelum, Nokkundi, Zhob and Khuzdar, large deficit in Astor, D.I.Khan, Multan, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Sibbi, Panjgur, Pasni, Jiwani, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor, Karachi(A/P) and Karachi(Masroor). The significant amounts of rainfall (mm) during the month are given in Table 5.

TABLE 4
Details of weather system during March 2003

S.No (1)	System (2)	Period (3)	Place of first location (4)	Direction of movement (5)	Place of final location (6)	Remarks (7)
(A) Low pressure area						
1	Low pressure area	1-2	Balochistan and adjoining areas	Eastwards	South Punjab and adjoining northeast Rajasthan	Moved away eastwards on 3
2	Do	9-10	Upper Sindh and adjoining areas	Do	Rajasthan and adjoining areas	Became less-marked on 11
3	Do	14-15	Southeast Iran and adjoining areas	Southeastwards	Do	Became less-marked on 16
4	Do	18-21	Do	Do	Balochistan	Became less marked on 22
5	Do	22-25	East Iran and adjoining areas	Southeastwards	South Punjab and adjoining Upper Sindh	Became less marked on 26
6	Do	27-29	Balochistan and adjoining areas	Do	Upper Sindh and adjoining areas	Moved away eastwards on 30
7	Do	29-31	Southeast Iran and adjoining areas	Do	Balochistan	Became less-marked on 1 April

(B) Western disturbances/eastward moving systems

1	Low pressure area with cyclonic circulation upto mid tropo-spheric level	1-4	Upper NWFP and adjoining North Punjab	Eastwards	Kashmir and adjoining areas	Moved away eastwards on 5
2	Low pressure area	9-11	NWFP and adjoining North Punjab	Do	Do	Moved away east northeast-wards on 12
3	Do	14-16	North of Afghanistan	East-south-eastwards	Do	Moved away east-northeast-wards on 17
4	Do	18-20	Do	Do	Do	Moved away east northeast-wards
5	Do	22-26	Northeast Afghanistan and adjoining NWFP	Eastwards	Do	Moved away east northeast-wards on 27
6	Low pressure area with cyclonic circulation upto lower tropospheric level	27-31	North of Afghanistan	Southeastwards	Do	Moved away northeast-wards on 1 April

Temperature

Cold wave conditions prevailed on 2 to 4 days in some parts of Hazara, Quetta and Mirpurkhas divisions, on 1 day each in Malakand, Rawalpindi, Mekran and Sukkur divisions. Night temperatures were appreciably to markedly below normal on 8 to 12 days in some parts of FATA and Rawalpindi division, on 4 to 6 days in D.I.Khan, Bahawalpur, Multan, Sibbi, Mekran and Sukkur divisions, on 1 to 3 days in Hazara, Malakand, Gujranwala, Faisalabad, Quetta, Larkana, Mirpurkhas, Hyderabad, and Karachi divisions. They were appreciably to markedly above normal on 8 to 13 days in some parts of Lahore, Sibbi, Mekran and Karachi divisions, on 4 to 7 days in Rawalpindi, Faisalabad, Bahawalpur, Larkana, Sukkur and Mirpurkhas divisions, on 1 to 3 days in Hazara, Multan, Quetta, Kalat and Hyderabad divisions. They were considerably above normal on 2 to 3 days in some parts of Quetta and Mekran divisions. They were generally normal to slightly below to above normal over the rest of the country on the remaining days.

The month's lowest minimum temperature in the plains of the country was 0.0°C recorded at Nokkundi (Quetta division) on 3 March 2003.

Day temperatures were considerably above normal on 1 day in some parts of Mekran division. They were appreciably to markedly above normal on 9 to 11 days in some parts of Quetta and Karachi divisions, on 4 to 7 days in Malakand, Rawalpindi, Kalat, and Sukkur divisions, on 1 to 3 days in FATA, Bahawalpur, Zhob, Sibbi, Mekran, Larkana and Mirpurkhas divisions. They were appreciably to markedly below normal on 3 to 5 days in some parts of Malakand, D.I.Khan, Gujranwala, Lahore, Faisalabad, Multan, Bahawalpur, Quetta, Zhob, Larkana, Sukkur, Hyderabad and Mirpurkhas divisions, on 1 to 2 days in FATA, Hazara, Rawalpindi, Sibbi, Mekran and Karachi divisions. They were considerably below normal on 1 to 2 days in Hazara, D.I.Khan, Rawalpindi, Gujranwala, Lahore, Jhelum, Bahawalpur, Quetta, Zhob, Sibbi, Mekran and Sukkur divisions. They were generally normal or slightly above to below normal over the rest of the country on the remaining days.

The month's highest maximum temperature in the plains of the country was 40.4°C recorded at Chhor (Mirpurkhas division) on 26 March 2003.

Disastrous weather and associated damage.

No such report appeared in the national press during this month.

Table 5
Principal amounts of rainfall (30 mm and above)

Date (1)	January (2)	February (3)	March (4)
1	Nil	Nil	Lahore (PBO) 39 & Lahore (A/P) 35
2	Nil	Murree 38	Kotli 168, Mianwali 93, Murree 84, Chaklala 76, Islamabad 72, Kamra 65, Balakot 55, Garhi Dupatta 53, Kakul 48, Barkhan 44, Jhelum 35, Dir & Malam Jabba 31 each
3	Nil	Nil	Kotli 68, Drosh 42 & Sialkot 34
4	Nil	Nil	Kotli 59 & Malam Jabba 31
5	Nil	Nil	Nil
6	Nil	Nil	Nil
7	Nil	Nil	Nil
8	Nil	Nil	Nil
9	Nil	Nil	Nil
10	Nil	Nil	Kalam 37
11	Nil	Nil	Nil
12	Nil	Nil	Nil
13	Nil	Nil	Nil
14	Nil	Nil	Nil
15	Nil	Nil	Kalam 42, Dir 35 & Drosh 33

Date (1)	January (2)	February (3)	March (4)
16	Nil	Nil	Nil
17	Nil	Garhi Dupatta 61, Malam Jabba 52, Muzaffarabad 49, Peshawar 46, Murree 45, Kalam, Saidu Sharif, Kamra & Islamabad 43 each, Balakot 41, Dir & Chaklala 40 each, Kotli, Parachinar & Kakul 32 each & Risalpur 31	Nil
18	Nil	Malam Jabba 140, Kamra 132,, Murree 122, Muzaffarabad 114, Kakul 104, Dir & Saidu Sharif 98 each, Risalpur 85, Mandi Bahauddin 67, Islamabad 61, Drosh 59, Kotli & Jhelum 56 each, Peshawar 55, Kohat 45, Lahore (A/P) 42, Sialkot 40, Parachinar & Faisalabad 37 each & Bahawalnagar 36	Nil
19	Pasni 37	Murree 121, Muzaffarabad & Jhelum 93 each, Kakul 89, Balakot 84, Sialkot 83, Malam Jabba 72, Mandi Bahauddin 65, Lahore (A/P) 63, Kalam & Lahore (PBO) 56 each, Islamabad 55, Chaklala 48, Chilas 43, Kamra 37 & Faisalabad 34	
20	Nil	Kalam 43, Sialkot 36 & Kamra 34	Nil
21	Nil	Nil	Nil
22	Nil	Nil	Nil

Date (1)	January (2)	February (3)	March (4)
23	Nil	Nil	Nil
24	Nil	Nil	Nil
25	Nil	Lasbella 34	Kalam 35
26	Nil	Nil	Nil
27	Nil	Nil	Nil
28	Nil	Kohat 36	Dalbandin 35
29	Nil	Nil	Cherat 90, Kalam 75, Malam Jabba & Kakul 73 each, Balakot 64, Muzaffarabad 62, Garhi Dupatta 56, Saidu Sharif 54, Risalpur 52, Kamra 42, Murree 39 & Kohat 33
30	Kohat 41, Peshawar 32	Nil	Kalam 35 & Malam Jabba 31
31	Chaklala 39 & Islamabad 33	Nil	Nil

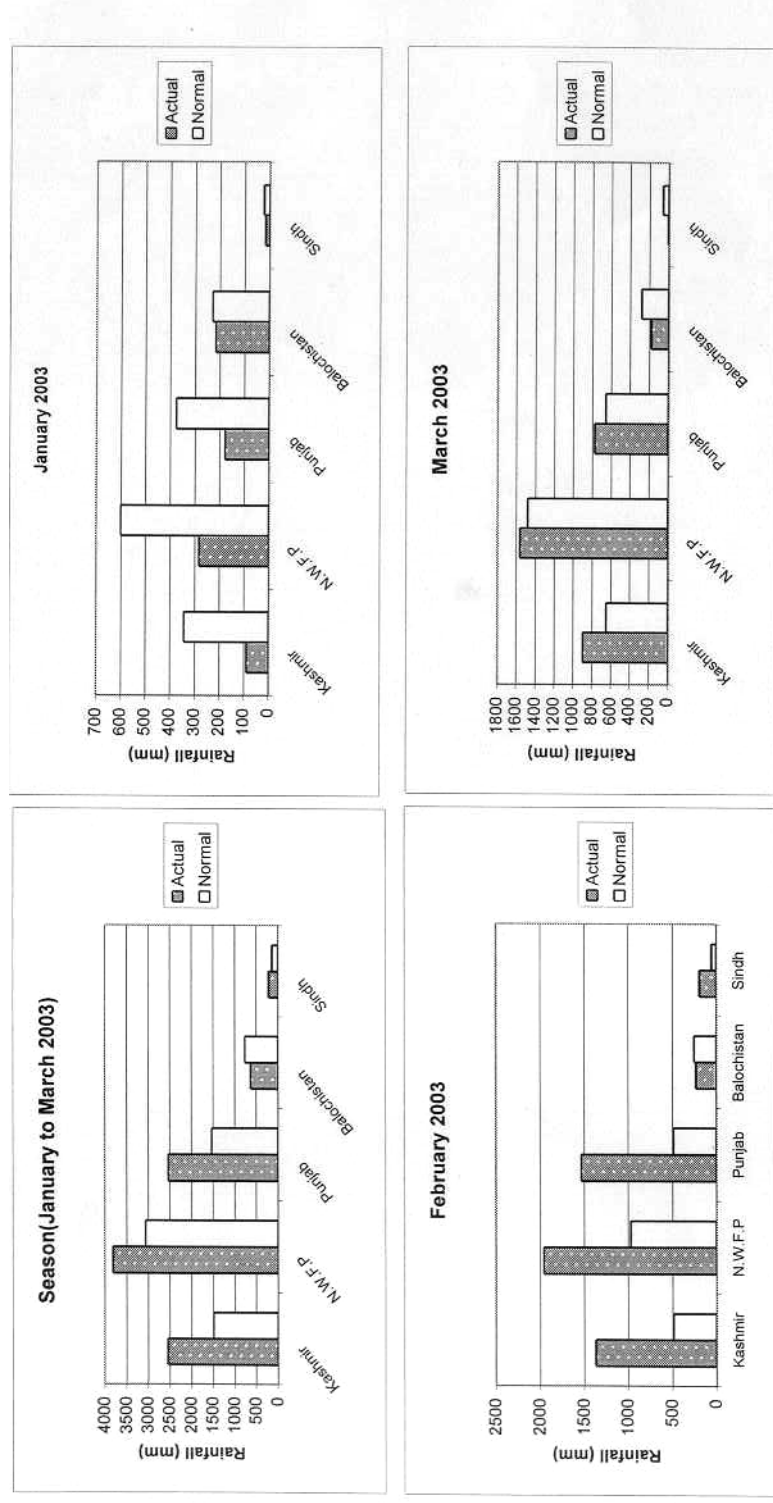


Fig 2

APPENDIX

Definition of the terms given in '*Italics*'

	<i>Rainfall</i>		<i>Temperature</i>
<i>Large excess</i>	Percentage departure from normal rainfall is + 51% or more.	<i>Cold wave</i>	Departure of minimum temperature form -8° C or less
<i>Moderate excess</i>	Percentage Departure from normal rainfall is + 26% to + 50%	<i>Markedly below normal</i>	Departure of temperature form normal is between -6° C to -7° C.
<i>Slight excess</i>	Percentage departure from normal rainfall is + 11% to +25%	<i>Appreciably below normal</i>	Departure of temperature form normal is between -4° C to -5° C.
<i>Normal</i>	Percentage departure from normal rainfall is – 10% to + 10%	<i>Slightly below normal</i>	Departure of temperature form normal is between -2° C to -3° C.
<i>Slight deficit</i>	Percentage departure from normal rainfall is -11% to -25%	<i>Normal</i>	Departure of temperature form normal is between -1° C to +1° C.
<i>Moderate deficit</i>	Percentage departure from normal rainfall is -26% to -50%	<i>Slightly above normal</i>	Departure of temperature form normal is between +2° C to +3° C.
<i>Large deficit</i>	Percentage departure from normal rainfall is -51% or less.	<i>Appreciably above Normal</i>	Departure of temperature form normal is between +4° C to +5° C.
<i>Heavy deficit</i>	Rainfall amount is from 44.5 mm to 88.9 mm in 24 hours	<i>Markedly above normal</i>	Departure of temperature form normal is between +6° C to +7° C.
<i>Very heavy rainfall</i>	Rainfall amount is 89.0 mm or more in 24 hours.	<i>Considerably above normal</i>	Departure of temperature form normal is +8° C or more.