WEATHER IN PAKISTAN POST MONSOON SEASON (OCTOBER - DECEMBER 2006)

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Introduction:

During the post monsoon season, few westerly low pressure waves passed across the country. A strong western disturbance affected the country from 2nd to 7th in the month of December. Dust storms have also been reported at a few places in plains of the country during the quarter. Fog phenomena were also observed in the second week of December in North Punjab. Lahore observed lowest visibility of 20 meters in Fog on December 31.

Seasonal Rainfall (October-December):

Seasonal rainfall out of 56 meteorological observing stations in the whole country, was in large excess in 47, moderate excess in 1, slight excess in 3, slight deficit in 1, moderate deficit in 3 and in large deficit in 1.

Rainfall was in large excess in Muzaffarabad, Garhi Dupatta, Kotli, Parachinar, Chitral, Dir, Drosh, Saidu Sharif, Kakul, Balakot, Kohat, Peshawar, Risalpur, Cherat, D.I.Khan, Chaklala (Rawalpindi), Murree, Jhelum, Sialkot, Mianwali, Sargodha, Faislabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Quetta, Dalbandin, Nokkundi, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Pasni, Jiwani, Moenjodaro, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Karachi (A/P), and Karachi(Masroor), moderate excess in Gupis, slight excess in Gilgit, Bunji, and Chilas, slight deficit in Astor, moderate deficit in Skardu, Khanpur and Chhor and was in large deficit in Badin. The principal amounts of rainfall during the month of October, November and December 2006 are given in Table 1. Seasonal station wise percentage rainfall departures are given in Fig. 1 and percentage departure in

Table 2 whereas province wise graphic representation of rainfall is given in Fig. 2.

Monthly Features:

October:

Weather and Associated Synoptic Features:

Details of weather systems formed during the month are given in Table 3.

Rain/thundershowers with a few duststorms in plains occurred almost at all the places or at a number of places on 4 – 5 days in Hazara and Sargodha regions,

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on 1 – 3 days in FATA, Kohat, Malakand, Bannu, D.I.Khan, Peshawar, Rawalpindi, Gujranwala, Lahore, Faisalabad, Multan and Zhob regions. Rain/thunderstorms with a few duststorms in plains also occurred at a few places or at isolated places on 5 days in Malakand region, on 1 – 3 days in FATA, Hazara, Peshawar, Bannu, Rawalpindi, Faisalabad D.G.Khan, Kalat, Zhob and Mekran regions.

Rainfall Distribution:

The rainfall was in large excess in 13 meteorological observing stations

(Muzaffarabad, Kotli, Parachinar, Peshawar, D.I.Khan, Chaklala, Sialkot, Sargodha, Faisalabad, Lahore (PBO), Lahore (A/P), Barkhan and Khuzdar); moderate excess in 1 meteorological observing station (Risalpur); slight excess in 3 meteorological observing stations (Bunji, Saidu Sharif, and Kohat); normal in 3 meteorological observing stations (Gilgit, Jhelum, and Nokkundi); slight deficit in 5 meteorological observing stations (Gupis, Cherat, Murree, Mianwali and Multan); moderate deficit in 4 meteorological observing stations (Astor, Kakul, Balakot and Shorekot) and in large deficit in 27 meteorological observing stations (Skardu, Chilas, Garhi Dupatta, Chitral, Dir, Drosh, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Dalbandin, Zhob, Sibbi, Kalat, Panjgur, Pasni, Jiwani, Moenjodaro, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor, Karachi (A/P) and Karachi (Masroor).

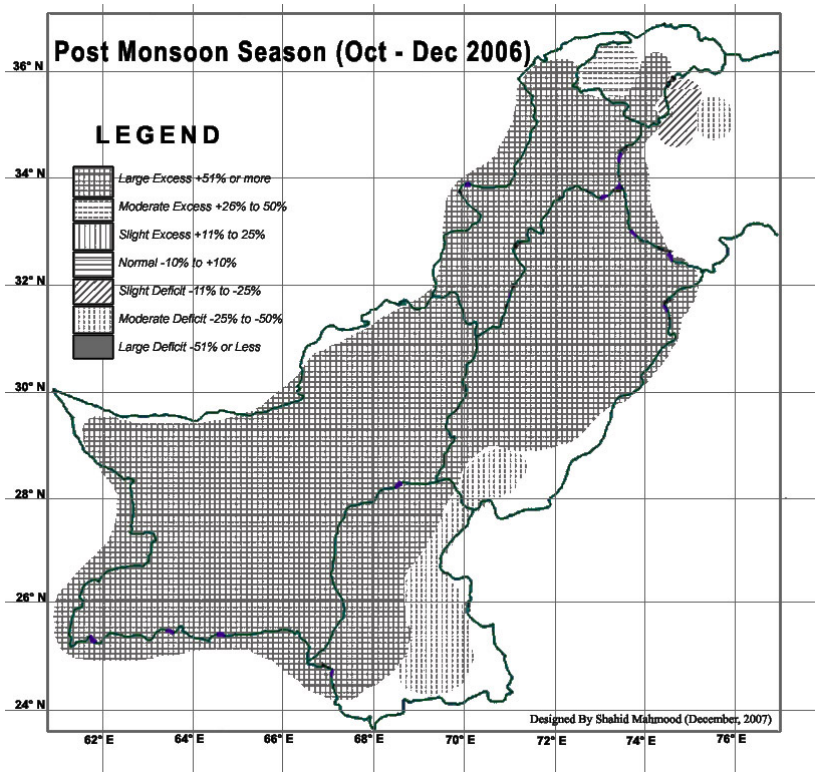

Figure 1

Table 1: **Principal amounts of rainfall (30 mm and above)**

Date	October	November	December
(1)	(2)	(3)	(4)
1	Nil	Nil	Nil
2	Nil	Nil	Jiwani 48.
3	Nil	Nil	Ormara 135, Gawadar 83, Pasni 69, Turbat 60, Panjgur 49, Kalat 34, Kalam & Khuzdar 33 & Dir 32.
4	Nil	Nil	Lasbella 39, Dir & Kalam 38, Kalat 32, Dadu 31 & Khuzdar 30.
5	Nil	Nil	Rawalpindi 116, Islamabad 102, Mangla 97, Mandi Bahauddin 83, Muzaffarabad & Murree 80, G. Dupatta 78, Cherat 72, Kotli 71, Sargodha 68, Dir 67, Balakot 66, Kakul 62, Kalam & Jhelum 57, Peshawar 56, Kamra 52, Parachinar & Risalpur 42, Faisalabad 40, Bannu 37, Karachi (A/P) 36, M. Jabba 33 & Sialkot 30.
6	Nil	Nil	G. Dupatta 68, Balakot 57, Rawalakot 49, Kakul 49, Murree 41, Chitral 33, Muzaffarabad 33 & Kotli 30.
7	Nil	Nil	Kohat 52.
8	Nil	Nil	Nil
9	Nil	Nil	Nil
10	Nil	Nil	Nil
11	Nil	Dir 36, Kalam 34, Parachinar 31 & Risalpur 30.	Nil
12	Nil	Muzaffarabad 44, Dir & Kalam 32.	Nil
13	Rawalpindi 43 & Muzaffarabad 33.	Rawalakot & Kalam 31 & M. Jabba 30.	Nil
14	Barkhan 45.	Nil	Nil

Date	October	November	December
(1)	(2)	(3)	(4)
15	Nil	Nil	Nil
16	Nil	Nil	Nil
17	Nil	Dir 38 & M. Jabba 30.	Nil
18	Nil	Nil	Nil
19	Nil	Nil	Nil
20	Sialkot 45, Saidu Sharif 37, Lahore (A/P) 36, Kotli & Rawalpindi 35 & Lahore (PBO) 30.	Nil	Nil
21	Nil	Nil	Nil
22	Nil	Nil	Muzaffarabad 33.
23	Nil	Nil	Nil
24	Nil	Nil	Nil
25	Nil	Nil	Nil
26	Bannu 38.	Nil	Dir 44, Kalam 36, Chitral 32 & M. Jabba 30.
27	Mangla 35.	Nil	Nil
28	Nil	Nil	Nil
29	Nil	Nil	Nil
30	Nil	Nil	Nil
31	Nil	__	Nil

Table 2: **Station wise rainfall (mm) for each month and season as a whole (Oct. – Dec. 2006)**

		Oct			Nov			Dec			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	5	6	-17	0	2	-100	9	3	200	14	11	27
2	Gilgit	6	6	0	4	3	33	6	4	50	16	13	23
3	Skardu	3	9	-67	1	8	-87	19	17	12	23	34	-32

		Oct			Nov			Dec			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)
4	Bunji	9	8	13	1	3	-67	8	5	60	18	16	13
5	Chilas	1	7	-86	2	7	-71	26	10	160	29	24	21
6	Astor	13	23	-43	28	19	47	18	27	-33	59	69	-14
7	Muzaffar-abad	62	40	55	105	37	184	187	70	167	354	147	141
8	Garhi Dupatta	22	48	-54	67	47	43	234	71	229	323	166	95
9	Kotli	56	32	75	50	25	100	141	49	188	247	106	133
10	Parachinar	54	32	69	98	17	476	128	29	341	280	78	259
11	Chitral	3	19	-84	57	29	97	109	34	221	169	82	106
12	Dir	19	62	-69	173	55	215	225	75	200	417	192	117
13	Drosh	8	31	-74	54	27	100	132	38	247	194	96	102
14	Saidu Sharif	62	51	21	54	28	93	158	45	251	274	124	121
15	Kakul	37	53	-30	85	29	193	172	56	207	294	138	113
16	Balakot	34	47	-28	93	41	127	188	73	157	315	161	96
17	Kohat	25	22	14	27	9	200	79	17	365	131	48	173
18	Peshawar	34	19	79	24	11	118	91	17	435	149	47	217
19	Risalpur	25	18	39	41	14	193	78	22	255	144	54	167
20	Cherat	17	19	-11	14	15	-7	111	26	327	142	60	137
21	D.I.Khan	10	6	67	32	2	1500	23	9	155	65	17	282
22	Chaklala	92	30	207	20	16	25	133	31	329	245	77	218
23	Murree	50	66	-24	74	34	118	172	76	126	296	176	68
24	Jhelum	18	19	-5	25	10	150	85	27	215	128	56	129
25	Sialkot	81	18	350	8	9	-11	39	24	63	128	51	151
26	Mianwali	13	15	-13	28	4	600	26	13	100	67	32	109
27	Sargodha	27	10	170	11	7	57	77	9	755	115	26	342
28	Faisalabad	20	4	400	9	3	200	46	6	667	75	13	477
29	Shorekot	3	6	-50	26	3	767	32	5	540	61	14	336
30	Lahore (P.B.O)	46	15	207	9	7	29	31	10	210	86	32	169

		Oct			Nov			Dec			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)
31	Lahore (A/P)	54	19	184	11	7	57	19	11	73	84	37	127
32	Multan	4	5	-20	3	2	50	31	3	933	38	10	280
33	Bahawal-pur	0	5	-100	5	4	25	15	3	400	20	12	67
34	Bahawal-Nagar	0	8	-100	4	3	33	24	3	700	28	14	100
35	Khanpur	0	27	-100	2	0	0	19	3	533	21	30	-30
36	Quetta	0	7	-100	72	4	1700	35	37	-5	107	48	123
37	Dalbandin	0	2	-100	11	3	267	43	10	330	54	15	260
38	Nokkundi	0	0	0	0	0	0	4	2	100	4	2	100
39	Zhob	0	6	-100	62	3	1967	32	11	191	94	20	370
40	Barkhan	47	9	422	11	5	120	50	6	733	108	20	440
41	Sibbi	0	4	-100	2	2	0	39	5	680	41	11	273
42	Kalat	0	5	-100	14	5	180	73	34	115	87	44	98
43	Khuzdar	29	7	314	3	5	-40	81	14	479	113	26	335
44	Panjgur	0	3	-100	3	2	50	83	9	822	86	14	514
45	Pasni	0	3	-100	0	1	-100	110	20	450	110	24	358
46	Jiwani	0	1	-100	0	4	-100	72	23	213	72	28	157
47	Moenjo-daro	0	2	-100	0	1	-100	18	1	1700	18	4	350
48	Jacobabad	0	2	-100	1	1	0	39	3	1200	40	6	567
49	Rohri	0	3	-100	0	1	-100	12	1	1100	12	5	140
50	Nawab-shah	0	5	-100	0	1	-100	31	2	1450	31	8	287
51	Padidan	0	2	-100	0	2	-100	27	2	1250	27	6	350
52	Hyderabad	0	3	-100	0	2	-100	11	1	1000	11	6	83
53	Badin	0	5	-100	0	3	-100	4	1	300	4	9	-55
54	Chhor	1	6	-83	0	4	-100	5	0	500	6	10	-40
55	Karachi (A/P)	0	2	-100	3	1	200	62	4	525	65	7	829
56	Karachi (Masroor)	0	1	-100	0	1	-100	25	6	933	25	8	213

Table 3: **Detail of weather systems during October 2006**

S.No	System	Period	Place of the first location	Direction of Movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
B) Western disturbance/eastward moving systems						
1)	Trough of Low	1- 2	Upper NWFP & adjoining areas	Northeastwards	Kashmir and adjoining areas	Moved away Northeastwards on 3.
2)	Do	10- 11	Do	Stationary	Upper NWFP & adjoining areas	Became less marked on 12.
3)	Low pressure area extended upto mid-troposph eric level	13-15	Do	Northeastwards	Kashmir and adjoining areas	Moved away Northeastwards on 16.
4)	Do	20-21	Upper NWFP & adj. areas. Its trough extended southwards	Northeastwards	Do	Moved away Northeastwards on 22.
5)	Do	25-27	Northeast Afghanistan & adj. areas	Eastwards	Do	Moved away Northeastwards on 28.

Temperature Distribution:

Night temperatures were appreciably to markedly below normal on 1 – 3 days in Kohat, Hazara, Peshawar, Quetta and Mekran regions. They were appreciably to markedly above normal on 23-26 days in Quetta, Mekran and Larkana regions on 15 – 19 days in Multan, Bahawalpur, Sukkur and Karachi regions, on 8 – 12 days in Rawalpindi, Sargodha, Lahore, Kalat, Sibbi, Mirpurkhas and Hyderabad regions, on 6 – 7 days in FATA and Peshawar regions. They were considerably above normal on 2 days in Quetta region. The month's lowest minimum temperature in plains of the country was 10.7°C recorded at Risalpur (Peshawar region) on October 21, 2006.

Disastrous Weather Events and Associated Damages:

According to press reports at least 16 people were injured when a fierce storm followed by rain lashed Lahore on the evening of October 12. The storm uprooted many trees, billboards and electric poles and made aviation at the airport difficult, delaying many flights and forcing diversion of many to other cities. The velocity of storm was recorded 98 km per hour at the airport and 74 km an hour in the main city.

November:

Weather and Associated Synoptic Features:

Details of weather systems formed during the month are given in Table 4.

Rain/thundershowers occurred almost at all the places or at a number of places on 4 – 7 days in FATA, Malakand, Hazara, Rawalpindi, Sargodha, Peshawar, Kohat, Quetta and Zhob regions, on 1 – 3 days in D.I.Khan, Bannu, Faisalabad, Lahore Gujranwala, and D.G.Khan, regions. Rain/thunderstorms also occurred at a few places or at isolated places on 4 – 6 days in Malakand, Bannu, Rawalpindi, and Quetta regions, on 1 – 3 days in FATA, Hazara, Peshawar, D.I.Khan, Kohat, Gujranwala, Sargodha, Bahawalpur, D.G.Khan, Faisalabad, Multan, Kalat, Zhob, Sibbi, Mekran, Larkana and Karachi regions.

Rainfall Distribution:

The rainfall was in large excess in 26 meteorological observing stations (Muzaffarabad, Kotli, Parachinar, Chitral, Dir, Drosh, Saidu Sharif, Kakul, Balakot, Kohat, Peshawar, Risalpur, D.I.Khan, Murree, Jhelum, Mianwali, Sargodha, Faislabad, Shorekot, Lahore (A/P), Quetta, Dalbandin, Zhob, Barkhan, Kalat and Karachi (A/P); moderate excess in 7 meteorological observing stations (Gilgit, Astor, Garhi Dupatta, Lahore (PBO), Multan, Bahawalnagar and Panjgur); slight excess in 2 meteorological observing stations (Chaklala and Bahawalpur); normal in 5 meteorological observing stations (Cherat, Khanpur Nokkundi, Sibbi and Jacobabad); slight deficit in 1 meteorological observing station (Sialkot); moderate deficit in 1 meteorological observing station (Khuzdar) and in large deficit in 14 meteorological observing stations (Gupis, Skardu, Bunji, Chilas, Pasni, Jiwani, Moenjodaro, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor, and Karachi(Masroor)).

Temperature Distribution:

Severe cold wave conditions prevailed on 1 day in Hazara region. Night temperatures were appreciably to markedly below normal on 5 - 7 days in Hazara and Quetta regions, on 1 – 3 days in Malakand, Peshawar, Bahawalpur, Kalat, Zhob, Sibbi, Mekran, Sukkur and Mirpurkhas regions. They were appreciably to markedly above normal on 16 - 19 days in Rawalpindi, Bahawalpur, Larkana and Mekran regions, on 13 – 15 days in Peshawar, Multan, Quetta, Sukkur and Hyderabad regions, on 7 – 10 days in Lahore,

Sargodha, Faislabad, Kalat and Sibbi regions, on 1 – 4 days in FATA, D.I.Khan, Mirpurkhas and Karachi regions. They were considerably above normal on 13 days in Quetta region, on 7 days in Sargodha region and on 1 – 3 days in Rawalpindi, Faisalabad, Bahawalpur, Multan, Kalat, Sukkur and Karachi regions. During the month, the lowest minimum temperature in plains of the country was 2.0° C recorded at Nokkundi (Quetta region) on November 25 & 26, 2006.

Table 4: **Details of the weather system during November 2006**

S. No	System	Period	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A) Low Pressure Area						
1)	Trough of Low	28-29	Northeast Arabian Sea & adj. areas.	Stationary	Northeast Arabian Sea & adj. areas	Became less-marked on 30
B) Western disturbances/eastward moving systems						
1)	Low pressure area extending upto mid-tropospheric level	10-13	Upper NWFP and adjoining areas	Eastwards	Kashmir and adjoining areas	Moved away Northeast-wards on 14
2)	Do	15-19	Balochistan & adj. Areas. Its trough extended northeast-wards	Northeastwards	Do	Moved away Northeast-wards on 20
3)	Do	21-22	NWFP & adj. Areas. Its trough extended southwards	Eastwards	Do	Moved away Northeast-wards on 23
4)	Low pressure area	28-30	Northeast Afghanistan & adj. NWFP	Do	Do	Moved away Northeast-wards on 1st of next month

Disastrous Weather Events and Associated Damages:

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

December:

Weather and Associated Synoptic Features:

Details of weather systems formed during the month are given in Table 5.

Rain/thundershowers with a number of moderate to heavy and few very heavy falls and few falls of snow over hill occurred almost at all the places or at a number of places on 8 days each in Malakand and Hazara regions, on 4 – 6 days in FATA, Peshawar, Rawalpindi, Gujranwala, Quetta, Zhob and Mekran regions, on 1 – 3 days in Bannu, Kohat, D.I.Khan, Sargodha, Faisalabad, Lahore, Multan, Bahawalpur, D.G.Khan, Sibbi, Kalat, Larkana, Sukkur, Hyderabad, and Karachi regions. Rain/thunderstorms with a few falls of snow over hills have also occurred at a few places or at isolated places on 3 – 4 days in Malakand, Rawalpindi, Quetta, Kalat, Mekran and Mirpurkhas regions, on 1 – 2 days in FATA, Hazara, Bannu, Peshawar, D.I.Khan, Gujranwala, Sargodha, Lahore, Bahawalpur, D.G.Khan, Sibbi, Larkana, and Hyderabad regions.

Rainfall Distribution:

The rainfall was in large excess in 52 meteorological observing stations (Gupis, Bunji, Chilas, Muzaffarabad, Garhi Dupatta, Kotli, Parachinar, Chitral, Dir, Drosh, Saidu Sharif, Kakul, Balakot, Kohat, Peshawar, Risalpur, Cherat, D.I.Khan, Chaklala, Murree, Jhelum, Sialkot, Mianwali, Sargodha, Faislabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Khanpur, Dalbandin, Nokkundi, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Pasni, Jiwani, Moenjodaro, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor, Karachi (A/P) and Karachi (Masroor); moderate excess in 1 meteorological observing station (Gilgit); slight excess in 1 meteorological observing station (Skardu); normal in 1 meteorological observing station (Quetta) and moderate deficit in 1 meteorological observing station (Astor).

Table 5: **Details of the weather system during December 2006**

S. No	System	Period	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	A) Low pressure area					
1)	Trough of Low	25-26	North Arabian Sea & adj. Sindh	Stationary	North Arabian Sea & adj. Sindh	Became less-marked on 27.
	B) Western disturbances/eastward moving systems					
1)	Low pressure area extending upto mid-tropospheric level	2-5	Balochistan & adj. North Arabian Sea.	Eastwards	Eastern Sindh & adj. areas.	Moved away Eastwards on 6.
2)	Do	3-7	Northeast Afghanistan& adj. areas.	Do	Kashmir & adj. areas.	Moved away NE-wards on 8.

S. No	System	Period	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	Low pressure area	10-12	NWFP & adj. areas.	Do	Do	Moved away NE-wards on 13.
4)	Do	20-22	Do	Do	Do	Moved away NE-wards on 23.
5)	Low pressure area extending upto mid-tropospheric level	24-27	Northeast of Afghanistan & adj. areas.	Southeast-wards	Do	Moved away NE-wards on 28.

Temperature Distribution:

Severe cold wave conditions prevailed on 1 day in Zhob region. Slight to moderate cold wave conditions prevailed on 12 - 15 days in FATA and Hazara regions, on 4 – 5 days in Malakand, Quetta and Mekran regions, on 1 – 3 days in Peshawar, Sibbi, Kalat, Zhob, Larkana, and Karachi regions. Night temperatures were appreciably to markedly above normal on 12 days in Quetta region, on 5 – 7 days in Rawalpindi, Sargodha, Multan, Sukkur, Mekran, Larkana and Mirpurkhas regions, on 1 – 4 days in Hazara, Peshawar, Lahore, Faisalabad, Bahawalpur, Sibbi, Zhob, Hyderabad and Karachi regions. They were considerably above normal on 1 day each in Rawalpindi and Mekran regions. The month's lowest minimum temperature in plains of the country was -0.5° C recorded at Nokkundi (Quetta region) on December 6, 2006.

Disastrous Weather Events and Associated Damages:

At least 17 people died in rain-related accidents as rains with thunder and lightning and a snowstorm struck many parts in the four provinces of the country on December 3, paralyzing life and wreaking havoc on the electricity and communications networks.

Two sisters were killed and three other people were injured when the roof of a house collapsed in torrential rains in northern areas on December 3.

A ten – year old boy was killed while his mother suffered serious injuries in a roof collapse following heavy rain at a village in Toba Tek Singh on December 4.

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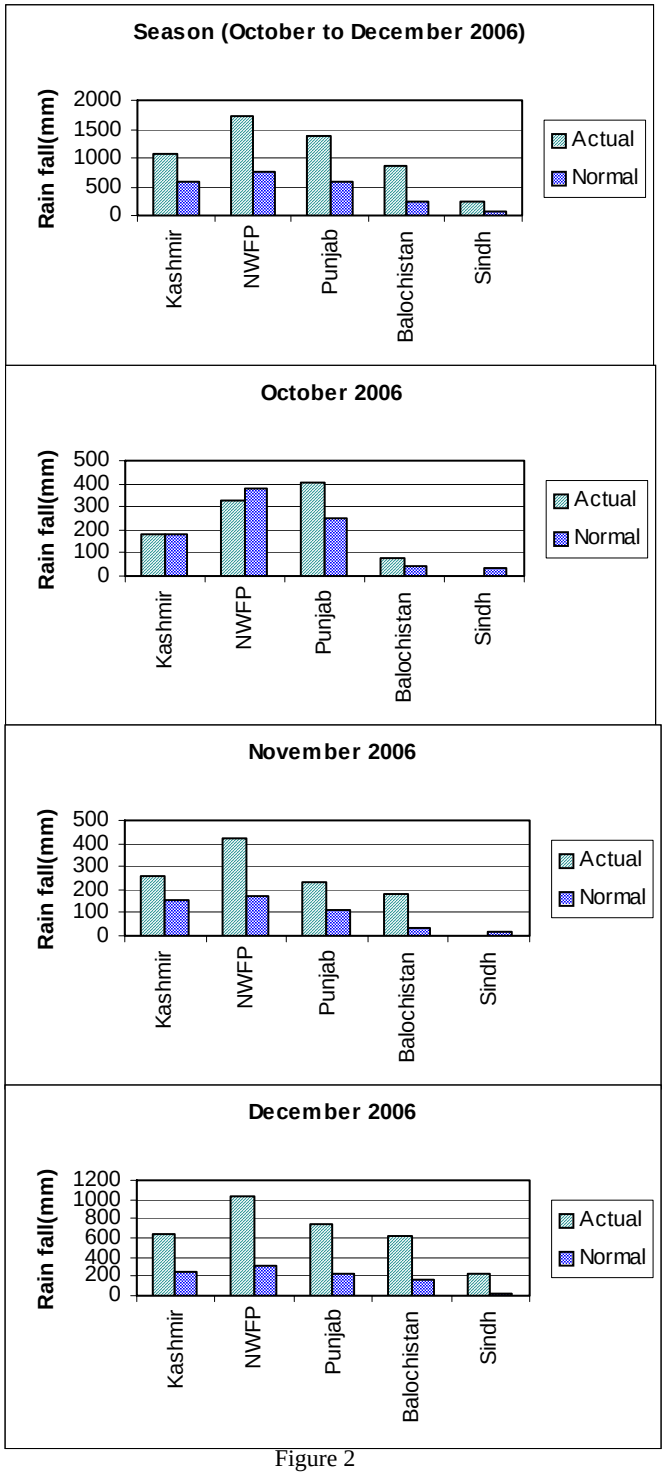
Season (October to December 2006)
Rain fall(mm)
2000
1500
1000
500
0
Kashmir
NWFP
Punjab
Balochistan
Sindh
Actual
Normal
October 2006
Rain fall(mm)
500
400
300
200
100
0
Kashmir
NWFP
Punjab
Balochistan
Sindh
Actual
Normal
November 2006
Rain fall(mm)
500
400
300
200
100
0
Kashmir
NWFP
Punjab
Balochistan
Sindh
Actual
Normal
December 2006
Rain fall(mm)
1200
1000
800
600
400
200
0
Kashmir
NWFP
Punjab
Balochistan
Sindh
Actual
Normal

Figure 2