

WEATHER IN PAKISTAN – POST MONSOON SEASON (OCTOBER-DECEMBER, 2005)

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Introduction:

During the post monsoon season, few westerly low-pressure waves passed across the country. Anti cyclonic circulation prevailed on most of the days during the month of November and December over the country. A severely destructive earthquake struck Pakistan, Afghanistan and some parts of India in the morning of October 8, 2005 having 7.5 magnitude on International Richter Scale. This was the strongest earthquake in the area during the last hundred years. The epicenter of this earthquake was at 34.41° N & 73.42° E about 11 km north northeast of Muzaffarabad. The earthquake was felt in many parts of Pakistan. About eighty thousands people killed, more than one hundred thousands got injuries and approximately 4 million people in the area became homeless. Fog phenomenon was also observed during last ten days of December in North Punjab which badly disrupted road traffic and national and international flights schedules. The lowest visibility of 10 meters was recorded at Lahore Airport on 21, 23, 24 & 30th December.

Seasonal rainfall (October-December);

Seasonal rainfall out of 56 meteorological observing stations (except missing from Balakot and Garhi Dupatta due to severely affected by the earthquake) in the whole country was in large excess in 2, normal in 4, moderate deficit in 9 and in large deficit in 39. Rainfall was in large excess in Gupis and Karachi (A/P), normal in Chitral, Dir, Drosh and Padidan, moderate deficit in Chilas, Astor, Kakul, Peshawar, Risalpur, Cherat, Chaklala, Murree and Jhelum and was in large deficit in Gilgit, Skardu, Bunji, Muzaffarabad, Kotli, Parachinar, Saidu Sharif, Kohat, D.I.Khan, Sialkot, Mianwali, Sargodha, Faisalabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Dalbandin, Nokkundi, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Pasni, Jiwani, Moenjodaro, Jacobabad, Rohri, Nawabshah, Hyderabad, Badin, Chhor and Karachi (Masroor). The Principal amounts of rainfall during the month of October, November and December 2005 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.

* Pakistan Meteorological Department.

Rain/thunderstorms occurred almost at the all the places or at a number of places on 4 days each in Malakand, Hazara and Rawalpindi regions, on 1-2 days in FATA, Kohat, Peshawar, Gujranwala and Sargodha regions. Rain/thunderstorms also occurred at a few places or at isolated places on 7 days in Malakand region, on 1-2 days in FATA, Peshawar, Rawalpindi, Faisalabad and Lahore regions.

Rain fall distribution:

The rainfall was in large excess in 6 meteorological observing stations (Gupis, Chitral, Dir, Drosh, Cherat and Jhelum); moderate excess in 3 meteorological observing stations (Kakul, Risalpur and Murree); slight excess in 1 meteorological observing station (Chaklala); normal in 4 meteorological observing stations (Parachinar, Nokkundi, Jiwani and Karachi (Masroor)); slight deficit in 1 meteorological observing station (Sargodha); moderate deficit in 3 meteorological observing stations (Kotli, Saidu Sharif and Peshawar) and in large deficit in 36 meteorological observing stations (Gilgit, Skardu, Bunji, Chilas, Astor, Muzaffarabad, Kohat, D.I.Khan, Sialkot, Mianwali, Faisalabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Dalbandin, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Pasni, Moenjodaro, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor and Karachi(A/P). The principal amount of rainfall during the month is given in table-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	Nil
3	Nil	Nil	Nil
4	Malam Jabba 42.	Nil	Nil
5	Nil	Nil	Nil
6	Nil	Nil	Nil
7	Nil	Nil	Nil
8	Nil	Nil	Nil
9	Dir 32 & Rawalakot 30.	Nil	Nil
10	Nil	Nil	Nil
11	Nil	Nil	Nil
12	Nil	Nil	Nil
13	Nil	Nil	Nil
14	Nil	Nil	Nil
15	Nil	Nil	Nil

Date	October	November	December
(1)	(2)	(3)	(4)
16	Murree 37, Rawalakot 35, Kakul 32 & Kalam 30.	Nil	Nil
17	Rawalakot 50.	Nil	Nil
18	Nil	Nil	Nil
19	Nil	Nil	Nil
20	Nil	Nil	Nil
21	Nil	Nil	Nil
22	Nil	Nil	Nil
23	Nil	Nil	Nil
24	Nil	Nil	Nil
25	Nil	Nil	Nil
26	Kalam 31.	Nil	Nil
27	Nil	Dir 49.	Nil
28	Nil	Nil	Nil
29	Nil	Nil	Nil
30	Nil	Nil	Nil
31	Nil	Nil	Nil

Table 2: Station wise rainfall (mm) for each month and season as a whole (Oct - Dec 2005)

		October			November			December			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	17	04	325	00	00	-100	00	04	-100	17	08	113
2	Gilgit	00	08	-100	04	02	100	00	04	-100	04	14	-71
3	Skardu	00	10	-100	01	06	-83	08	14	-43	09	30	-70
4	Bunji	00	11	-100	05	03	67	02	04	-50	07	18	-61
5	Chilas	00	13	-100	09	04	125	09	11	-18	18	28	-36
6	Astor	00	30	-100	15	14	07	32	26	23	47	70	-33
7	Muzaffar- abad	08	51	-84	19	35	-46	00	77	-100	27	163	-83
8	Garhi Dupatta	N/A	64	-	18	45	-60	00	79	-100	18	188	-
9	Kotli	19	37	-49	02	27	-93	00	60	-100	21	124	-83
10	Parachinar	27	29	-07	13	20	-35	00	33	-100	40	82	-51
11	Chitral	35	16	119	34	19	79	02	41	-95	71	76	-07
12	Dir	105	54	94	92	51	80	00	91	-100	197	196	01
13	Drosh	44	28	57	51	26	96	04	47	-91	99	101	-02
14	Saidu Sharif	30	55	-45	38	31	23	00	56	-100	68	142	-52
15	Kakul	79	57	39	21	32	-34	00	61	-100	100	150	-33
16	Balakot	N/A	45	-	35	46	-24	00	81	-100	35	172	-
17	Kohat	10	26	-61	04	11	-64	00	23	-100	14	60	-77
18	Peshawar	05	10	-50	20	12	67	00	23	-100	25	45	-44
19	Risalpur	18	14	29	16	16	00	00	21	-100	34	51	-33
20	Cherat	30	14	114	20	18	11	00	37	-100	50	69	-27
21	D.I.Khan	00	05	-100	00	02	-100	00	10	-100	00	17	-100
22	Chaklala	36	29	24	06	18	-67	00	37	-100	42	84	-50
23	Murree	92	70	31	16	33	-51	00	70	-100	108	173	-37
24	Jhelum	32	12	167	00	10	-100	00	30	-100	32	52	-38
25	Sialkot	03	15	-80	00	09	-100	00	31	-100	03	55	-95
26	Mianwali	00	10	-100	00	04	-100	00	14	-100	00	28	-100
27	Sargodha	06	08	-25	02	06	-67	00	21	-100	08	35	-77
28	Faisalabad	00	04	-100	00	03	-100	00	09	-100	00	16	-100
29	Shorekot	00	02	-100	00	04	-100	00	06	-100	00	12	-100

October			November			December			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)

30	Lahore (P.B.O)	01	12	-92	00	04	-100	00	14	-100	01	30	-97
31	Lahore (A/P)	00	17	-100	00	05	-100	00	15	-100	00	37	-100
32	Multan	00	02	-100	00	02	-100	00	07	-100	00	11	-100
33	Bahawal-pur	00	01	-100	00	04	-100	00	03	-100	00	08	-100
34	Bahawal- Nagar	00	01	-100	03	03	00	00	04	-100	03	08	-63
35	Khanpur	00	01	-100	00	01	-100	00	03	-100	00	05	-100
36	Quetta	00	04	-100	04	05	-20	00	31	-100	04	40	-90
37	Dalbandin	00	01	-100	00	03	-100	00	08	-100	00	12	-100
38	Nokkundi	00	00	00	00	00	00	00	02	-100	00	02	-100
39	Zhob	00	03	-100	00	04	-100	00	13	-100	00	20	-100
40	Barkhan	00	05	-100	00	05	-100	00	08	-100	00	18	-100
41	Sibbi	00	01	-100	00	01	-100	00	03	-100	00	05	-100
42	Kalat	00	01	-100	00	02	-100	00	07	-100	00	10	-100
43	Khuzdar	00	04	-100	00	06	-100	00	17	-100	00	27	-100
44	Panjur	00	01	-100	00	01	-100	00	09	-100	00	11	-100
45	Pasni	00	02	-100	00	00	00	00	22	-100	00	24	-100
46	Jiwani	00	00	00	00	05	-100	00	20	-100	00	25	-100
47	Moenjo-daro	00	04	-100	00	00	00	00	01	-100	00	05	-100
48	Jacobabad	00	02	-100	00	01	-100	00	04	-100	00	07	-100
49	Rohri	00	01	-100	00	01	-100	00	04	-100	00	06	-100
50	Nawab-shah	00	03	-100	00	01	-100	00	03	-100	00	07	-100
51	Padidan	00	02	-100	00	02	-100	07	03	133	07	07	00
52	Hyderabad	00	01	-100	00	02	-100	00	02	-100	00	05	-100
53	Badin	00	04	-100	00	02	-100	00	01	-100	00	07	-100
54	Chhor	00	02	-100	00	04	-100	00	01	-100	00	07	-100
55	Karachi (A/P)	00	01	-100	00	02	-100	17	04	325	17	07	143
56	Karachi (Masroor)	00	00	00	00	02	-100	00	05	-100	00	07	-100

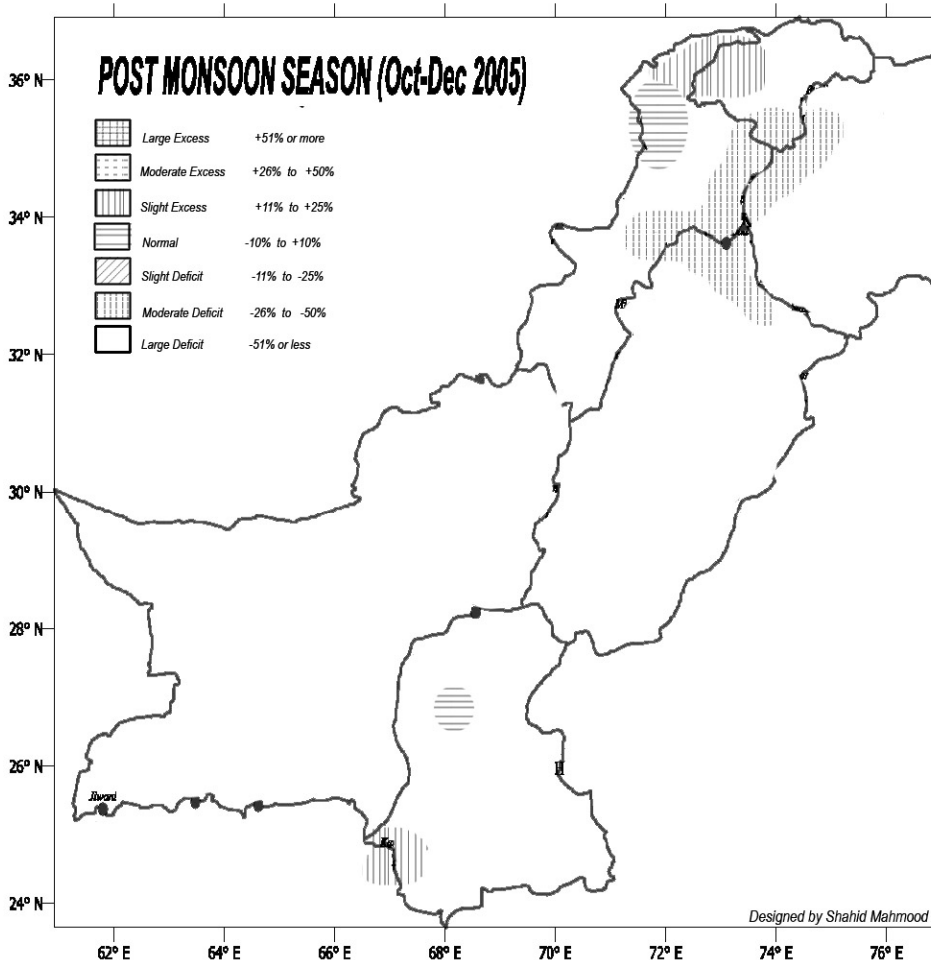


Fig 1

Temperature distribution

Night temperatures were appreciably to markedly below normal on 17 days in Hazara region, on 4-6 days in Peshawar, Mirpurkhas and Gujranwala regions, on 1-2 days in Sukkur, Rawalpindi, Malakand, Kohat, Quetta, Zhob and Karachi regions. They were appreciably to markedly above normal on 10-16 days in Lahore and Quetta regions, on 4-7 days in Rawalpindi, Mekran, Sibbi and Larkana regions, on 1-3 days in FATA, Bahawalpur, Faisalabad, Kalat, Sargodha, Multan, Sukkur, Mirpurkhas and Karachi regions.

The month's lowest minimum temperature in plains of the country was 7.7° C recorded at Islamabad (Rawalpindi region) on October 29.

Table 3: Detail of weather systems during October 2005

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	8-9	Upper NWFP and adj. areas	Stationary	Upper NWFP and adj. areas	Became less marked on 10.
2	Low pressure area	11-12	Punjab, adj. NWFP and Kashmir	Stationary	Punjab and adj. areas	Became less marked on 13.
3	Do	25-26	NWFP and adj. Kashmir	Eastwards	Kashmir and adj. areas	Moved away eastwards on 27.
B) Western Disturbance/Eastwards moving system						
1)	Low pressure area extended upto mid-tropospheric level	4-5	Upper NWFP and adj. areas	Eastwards	Kashmir and adj. areas	Moved away eastwards on 6.
2)	Do	14-17	North of NWFP and adj. areas	Southeastwards	Do	Moved away eastwards on 18.

Disastrous weather events and associated damages:

A devastating earthquake hit northern areas of Pakistan and Kashmir in the morning of 8th October 2005. It caused heavy damage to life and properties in northern areas especially in Balakot and district Bagh of Muzaffarabad. About eighty thousands people lost their lives, more than one hundred thousands got injuries and approximately 4 million people in the area became homeless.

November

Weather and associated synoptic features:

Detail of weather systems formed during the month is given in Table 4.

Rain/thunderstorms occurred almost at all the places or at a number of places on 4 days each in Malakand and Hazara regions, on 1-2 days in FATA, Bannu, Kohat, Peshawar and Rawalpindi regions. Rain/thunderstorms also occurred at a few places or at isolated places on 3-4 days in FATA, Malakand and

Rawalpindi regions, on 1-2 days in Hazara, Peshawar, Sargodha, Bahawalpur and Quetta regions.

Rainfall distribution:

The rainfall was in large excess in 7 meteorological observing stations, (Gilgit, Bunji, Chilas, Chitral, Dir, Drosh and Peshawar; slight excess in 2 meteorological observing stations (Saidu Sharif and Cherat); normal in 6 meteorological observing stations (Astor, Risalpur, Bahawalnagar, Nokkundi, Pasni and Moenjodaro); slight deficit in 2 meteorological observing stations Balakot and Quetta); moderate deficit in 3 meteorological observing stations (Muzaffarabad Parachinar and Kakul) and in large deficit in 36 meteorological observing stations (Gupis, Skardu, Garhi Dupatta, Kotli, Kohat, D.I.Khan, Chaklala, Murree, Jhelum, Sialkot, Mianwali, Sargodha, Faisalabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Khanpur, Dalbandin, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Jiwani, Jacobabad, Rohri, Nawabshah, Padidan, Hyderabad, Badin, Chhor, Karachi (A/P) and Karachi (Masroor);

The principal amount of rainfall during the month are given in Table-1

Table 4: Details of the weather system during November 2005

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	Low pressure area	20-21	Balochistan and adj. areas	Stationary	Balochistan and adj. areas	Became less marked on 22.
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B) Western Disturbance/Eastwards moving system

1)	Low pressure area extended upto mid tropospheric level	10-13	Upper NWFP and adj. areas	Eastwards	Kashmir and adj. areas	Moved away northeastwards on 14.
2)	Do	26-30	Do	Do	DO	Moved away northeastwards on 1 st of next month.

Temperature distribution:

Night temperatures were considerably below normal on 1 day in Kalat region. They were appreciably to markedly below normal on 4-6 days in Malakand, Peshawar, Rawalpindi, Gujranwala, Quetta and Kalat regions, on 1-2 days in FATA, Kohat, Zhob, Sibbi, Mekran, Sukkur and Mirpurkhas regions. They

were appreciably to markedly above normal on 21 days in Lahore region, on 9-11 days in Quetta and Karachi regions, on 5-8 days in Rawalpindi, Sargodha, Mekran, Larkana and Hyderabad regions, on 1-4 days in FATA, Gujranwala, Multan, Bahawalpur, Sukkur, Sibbi, Kalat and Zhob regions. They were considerably above normal on 4 days in Quetta region, on 1 day each in Sargodha, Lahore, Faisalabad, Bahawalpur, Mekran, Larkana, Sukkur, Hyderabad, Mirpurkhas and Karachi regions. The month's lowest minimum temperature in plains of the country was 1.0° C recorded each at Risalpur (Peshawar region) on November 18 and Nokkundi(Quetta region) on November 30.

Disastrous weather events and associated damages:

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

December

weather and associated synoptic features:

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

Rain/thunderstorms occurred almost at all the place or at a number of places on 1 day in Karachi region and at a few places or at isolated places on 1-2 days in Malakand, Sukkur and Hyderabad regions.

Rainfall distribution:

The rainfall was in large excess in 2 meteorological observing stations (Padidan and Karachi (A/P)); slight excess in 1 meteorological observing station (Astor); slight deficit in 1 meteorological observing station (Chilas); moderate deficit in 2 meteorological observing stations (Skardu and Bunji) and in large deficit in 50 meteorological observing stations (Gupis, Gilgit, 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, Faisalabad, Shorekot, Lahore (PBO), Lahore (A/P), Multan, Bahawalpur, Bahawalnagar, Khanpur, Quetta, Dalbandin, Nokkundi, Zhob, Barkhan, Sibbi, Kalat, Khuzdar, Panjgur, Pasni, Jiwani, Moenjodaro, Jacobabad, Rohri, Nawabshah, Hyderabad, Badin, Chhor and Karachi (Masroor). The principal amount of rainfall during the month is given in Table-1.

Temperature distribution:

Night temperatures were considerably below normal on 1 day each in Quetta and Mirpurkhas regions. They were appreciably to markedly below normal on 10-16 days in Hazara, Kohat, Gujranwala, Zhob and Mirpurkhas regions, on 5-9 days in Peshawar, D.I.Khan, Rawalpindi, Bahawalpur, Quetta, Kalat, Mekran, Sukkur and Karachi regions, on 1-4 days in Malakand, Faisalabad, Multan, Sibbi, Larkana and Hyderabad regions. They were appreciably to markedly above normal on 1-3 days in Malakand, Multan, Bahawalpur, Lahore, Quetta, Kalat, Mekran, Sukkur, Larkana, Hyderabad, Mirpurkhas and Karachi regions. They were considerably above normal on 1 day in Quetta region. The month's

lowest minimum temperature in plains of the country was -3.5° C recorded at Risalpur (Peshawar region) on December 14.

Disastrous weather events and associated damages:

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

Table 5: **Details of the weather system during December 2005**

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	Low pressure area	19-20	South Balochistan and adj. Sindh	Stationary	South Balochistan and adj. Sindh	Became less marked on 21.
B) Western Disturbance/Eastwards moving system						
1)	Low pressure area	27-28	Afghanistan and adj. areas	Northeastwards	Upper NWFP and adj. areas	Moved away Northeastwards on 29.

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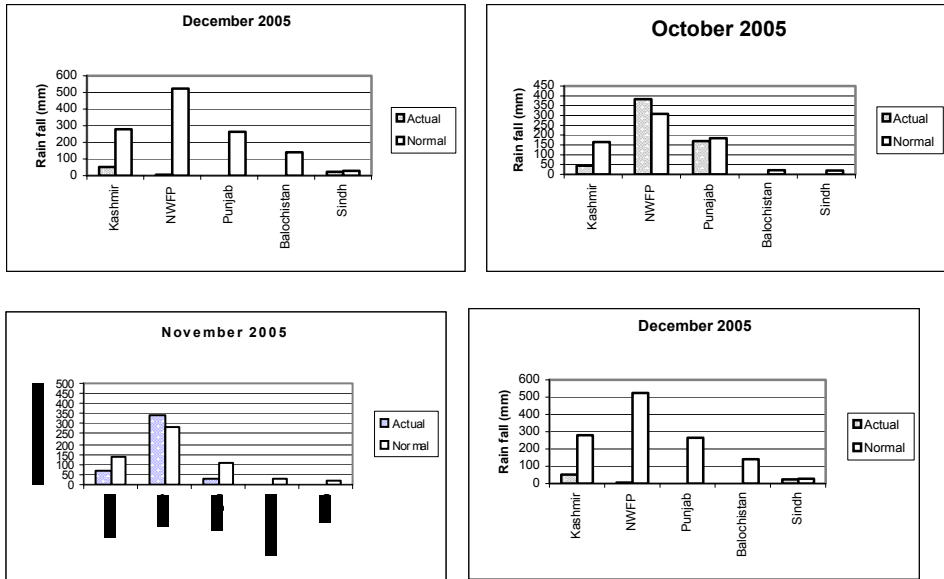


Fig 2

Appendix:

	<i>Rainfall</i>		<i>Temperature</i>
<i>Large excess</i>	percentage departure from normal rainfall is + 51% or more.	<i>Severe cold wave</i>	Departure of min. temperature from normal is - 8° C or less.
<i>Moderate excess</i>	percentage departure from normal rainfall is + 26% to + 50%.	<i>Considerably below normal</i>	Departure of min/max. temperature from normal is - 8° C or less.
<i>Slight excess</i>	percentage departure from normal rainfall is + 11% to + 25%.	<i>Markedly below normal</i>	Departure of min/max. temperature from normal is between - 6° C to - 7° C.
<i>Normal</i>	percentage departure from normal rainfall is - 10% to + 10%.	<i>Appreciably below normal</i>	Departure of min/max. temperature from normal is between - 4° C to - 5° C.
<i>Slight deficit</i>	percentage departure from normal rainfall is - 11% to - 25%.	<i>Markedly above normal</i>	Departure of max/min. temperature from normal is between + 6° C to + 7° C.
<i>Moderate deficit</i>	percentage departure from normal rainfall is - 26% to - 50%.	<i>Appreciably above normal</i>	Departure of max/min. temperature from normal is between + 4° C to + 5° C.
<i>Large deficit</i>	percentage departure from normal rainfall is - 51% or less.	<i>Considerably above normal</i>	Departure of max/min. temperature from normal is +8° C or more.
<i>Almost at all places reporting</i>	66 % or more stations of a meteorological division atleast 2.5 mm rainfall.		
<i>At a number of places reporting</i>	33 % to 66 % stations of a meteorological division atleast 2.5 mm rainfall.		
<i>At a few places reporting</i>	33 % or less stations of a meteorological division atleast 2.5 mm rainfall.		
<i>Isolated places</i>	One or two stations of a meteorological division.		
<i>Heavy rain</i>	rainfall amount is from 44.5 mm to 88.9 mm in 24 hour		
<i>Very heavy rainfall</i>	rainfall amount is 89.0 mm or more in 24 hours.		