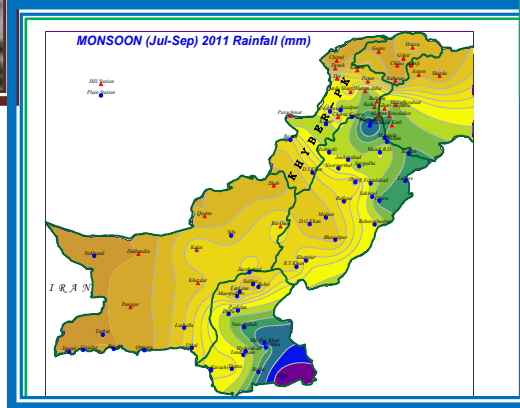




Government of Pakistan
Ministry of Defence
PAKISTAN METEOROLOGICAL DEPARTMENT



SPECIAL REPORT ON PAKISTAN'S MONSOON 2011 RAINFALL

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Special Report on Pakistan's Monsoon 2011 Rainfall

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INTRODUCTION

In Pakistan the summer monsoon period is taken from July to September. The rainfall during the monsoon season accounts for 50 % of the total annual rainfall. The monsoon normally reaches the eastern border of Pakistan around first of July. Being an agriculture country, Pakistan's economy, in general and, water and crop availability in particular, are largely dependent on the monsoon rainfall. Hence a little variation in the monsoon rainfall, over the country, may adversely affect water resources, agriculture sector and hydro-power generation. The excessive monsoon rainfall during the past two years (2010 & 2011) had caused severe flash flooding in some parts of the country and resulted devastating impact on the economy of Pakistan. Similarly the deficient monsoon rainfall, in the recent years, had left adverse socio-economic impact.

The main feature, which make monsoon 2011 rainfall significant, was the record breaking rainfall over some parts of Sindh. During the season, PMD rain gauges, installed in the area, recorded heaviest rainfall which exceeded the historical records, such as Mithi (1348 mm), Mirpur Khas (866 mm), Nawabshah (650 mm), Chhor (552 mm) and Dadu (485 mm). These devastating rains resulted in unprecedented flood situation in Sindh. These unusual and heavy floods affected millions of people, damaged millions of houses and destroyed crops on hundreds of thousands of acres besides leaving hundreds of people dead. The volume of rainwater, received by Sindh during the four-week monsoon spell, is estimated to be over 49 million acre feet — almost equal to the capacity of six Tarbela dams — (Dr Qamar-uz-Zaman Chaudhry),

HIGH LIGHTS OF THE SEASON

Normally, the summer monsoon sets over the north eastern parts of country around 1st July with standard deviation of five days. The summer monsoon 2011 was set on 28th June at the eastern border of Pakistan and was with in the normal range. During this period wide spread rainfalls of 35-75 mm per day were reported by number of stations. The monsoon, then subsequently advanced to other part of the country.

The seasonal rainfall (during July to September 2011) over Pakistan, was 72 %, i.e. excessively above normal (1961-1990) and is ranked fifth heaviest monsoon rainfall during past 51 years. Similarly, the seasonal rainfall was 11% (slightly above normal) over the province of Khyber Pakhtunkhwa, 48% (moderately above normal) over Punjab, 39.2% (moderately above normal) over Balochistan and 248% (exceptional above normal) over the province of Sindh. The recent monsoon rainfall over Sindh was the second heaviest recorded during the period 1961-2011. The distribution of seasonal rainfall over the country and provinces are given in Table-1. The performance of the country's monsoon rainfall, during the period 1961 to 2011, is given in Figure-1.

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Table-1

Region	Area Weighted Monsoon Rainfall (mm)		Percentage Departure
	Normal	2011	
<i>Pakistan</i>	137.5	236.5	72.
<i>Khyber-PK</i>	225.2	249.2	11
<i>Punjab</i>	235.7	348.7	48
<i>Balochistan</i>	58.8	81.9	39
<i>Sindh</i>	127.5	443.9	248.

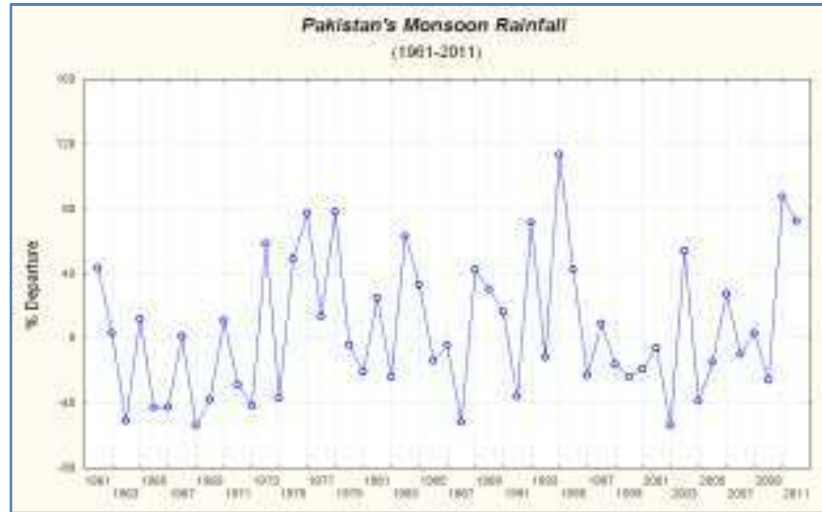


Fig.1: Pakistan Monsoon rainfall during 1961-2011

During the monsoon season (2011), the rainfall of Sindh remained largely above normal, though the rainfall in July was largely below normal but the rainfall contribution during August and September 2011, made it highly above normal. Some anomalous synoptic features observed during the season are as under:

- a) The position of the seasonal/heat low, mostly remained over northwestern parts or northern parts of Balochistan. Which ultimately made most of the monsoon lows to penetrate further in Sindh and Eastern Balochistan having average central pressure being 988-989 hpa in July & August, which is around 2-4 hpa lower than the average pressure. This lower pressure may be one of the reasons for attracting the low-pressure systems towards Sindh.
- b) A number of Mid-Tropospheric Cyclones (MTC) formed over Northeastern Arabian Sea and adjoining Saurashtra and Kuch region, during August and first half of September which also contributed heavy rainfall in Sindh and adjoining areas.
- c) A prominent Sub-Tropical high pressure at 200-hpa level was observed over Tibetan Platu, with its orientation being northeast to southeast during most of the period, which resulted in a prominent east northeasterly flow. Another noticeable aspect was the position of a Sub-tropical high pressure at the same level, which was exactly lying over Southern parts of Pakistan and the ridge line was passing through 26-28°N during the active

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precipitation period, which resulted into a prominent easterly flow over southern parts of Pakistan.

- d) The position of the monsoon trough, which usually extends from Eastern parts to northwestern parts of India. During this monsoon season, particularly in August/September the orientation of monsoon trough remained east-west in lower latitudes over India. The lows/depressions formed over Head Bay of Bengal, moved westwards instead of their normal northwest movement which ultimately resulted in heavy rains persistence over Sindh.

Table-2
Sindh Monsoon 2011 Rainfall (mm) and historical records

SN	Station (record period)	July			August		
		Actual	Normal	Highest	Actual	Normal	Highest
1	Mithi (2004-2010)	9.0	78.2	303.8 (2009)	562.8*	150.7	346.3 (2006)
2	Mirpur Khas (2004-2010)	0.1	112.8	112.8 (2010)	263.1*	71.1	229.1 (2006)
3	Nawabshah (1954-2010)	22.0	50.9	326.4 (1956)	275.2*	46.0	234.4 (1994)
4	Badin (1931-2010)	31.4	67.6	302.9 (2003)	331.2	92.5	459.0 (1979)
5	Chhor (1931-2010)	8.0	79.3	354.3 (2003)	276.0	69.3	356.1 (1990)
6	Dadu (2004-2010)	3.0	33.0	132.0 (2010)	134.1	29.0	93.0 (2008)
7	Padidan (1933-2010)	0.2	40.5	207.0 (1956)	251.2	40.5	300.1 (1992)
8	Hyderabad (1931-2010)	7.0	45.5	273.6 (1956)	162.2	63.0	284.6 (1994)
9	Karachi Airport (1931-2010)	7.7	66.2	429.3 (1967)	61.1	60.0	262.5 (1979)
10	Thatta (2004-2010)	0.0	73.5	181.1 (2010)	131.0	73.8	148.0 (2007)
11	Jacobabad (1931-2010)	31.0	42.8	332.5 (1956)	29.2	35.4	298.3 (1988)
12	Karachi Masroor (1957-2010)	0.5	83.7	509.3 (1967)	44.0	50.9	272.0 (2007)
13	Larkana (1988-2010)	10.2	69.4	306.0 (1994)	83.2	31.1	207.0 (2010)
14	Rohri (1931-2010)	42.0	45.5	336.1 (1978)	42.2	25.1	142.2 (1933)
15	Sukkur (1997-2010)	8.0	20.8	117.6 (2006)	47.0	20.4	130.0 (2008)
16	Moin-Jo-Daro (1931-2010)	0.0	44.8	213.5 (1989)	53.0	31.0	160.0 (1994)

SN	Station (record period)	September			July-September			
		Actual	Normal	Highest	Actual	Normal	%Dep	Highest
1	Mithi (2004-2010)	776.1*	58.6	220.0 (2006)	1347.9*	287.5	368.8	669.8 (2006)
2	Mirpur Khas (2004-2010)	603.0*	12.3	67.2 (2006)	866.2*	196.2	341.5	381.2 (2006)
3	Nawabshah (1954-2010)	353.2*	16.2	238.7 (1994)	650.4*	113.1	475.1	544.2 (1994)
4	Badin (1931-2010)	284.0	27.1	347.7 (1970)	646.6	187.2	245.4	806.3 (1994)
5	Chhor (1931-2010)	268.0	37.3	381.6 (1998)	552.0*	185.9	366.0	521.0 (2003)
6	Dadu (2004-2010)	348.1*	6.0	33.2 (2005)	485.2*	68.0	613.5	158.0 (2006)
7	Padidan (1933-2010)	172.0*	13	135.7 (1976)	423.4	93.6	352.4	478.4 (1992)
8	Hyderabad (1931-2010)	240.2	12.6	286.0 (1962)	409.4	121.1	238.1	457.7 (1994)
9	Karachi Airport (1931-2010)	212.2	10.1	315.7 (1959)	281.0	136.3	106.2	597.3 (1959)
10	Thatta (2004-2010)	114.0*	25.7	88.7 (2006)	245.0	173.0	41.6	343.0 (2010)
11	Jacobabad (1931-2010)	183.1*	11.0	107.0 (1976)	243.3	89.2	172.8	332.0 (1956)
12	Karachi Masroor (1957-2010)	159.2	19.4	200.4 (1959)	203.7	154.0	32.3	706.9 (1967)
13	Larkana (1988-2010)	79.0*	5.5	72.0 (1994)	172.4	106.0	62.6	510.0 (1994)
14	Rohri (1931-2010)	49.0	11.8	155.2 (1976)	133.2	82.4	61.7	400.0 (1994)
15	Sukkur (1997-2010)	48.0*	0.9	16.0 (2008)	103.0	42.1	144.7	146.0 (2008)
16	Moin-Jo-Daro (1931-2010)	48.1	6.7	83.3 (1994)	101.1	82.5	22.5	376.6 (1994)

* new record; Normal= 1961-1990 or averaged over the available period

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During the recent monsoon season, the area of Mithi and Mirpur Khas received record breaking rainfall of 1,348 millimeters (53.07 inch) and 866.2 millimeters (34.10 inch) during the season, respectively. The earlier maximum rainfall recorded in these two cities were 669.8 millimeters (26.4 inch) and 381.2 millimeters (15.0 inch) both in 2006, respectively; whereas District Badin of Sindh province received rainfall of 587.2 millimeters (23.19 inch) during the monsoon spell, placing it at second heaviest rainfall of the season. The present and past rainfall records of Sindh's stations are illustrated in Table-2. The detail of the historical driest and wettest monsoon years of Pakistan and Sindh, are illustrated in the Table-3.

Table-3
Driest & wettest Monsoon years (1961-2011)

Pakistan					Sindh				
SN	Driest		Wettest		SN	Driest		Wettest	
	Year	Dep(%)	Year	Dep(%)		Year	Dep(%)	Year	Dep(%)
1	1968	-54	1994	113	1	2002	-95	1994	280
2	2002	-54	2010	87	2	1974	-95	2011	248
3	1987	-52	1978	78	3	1991	-94	1961	152
4	1963	-51	1976	77	4	1987	-91	1992	151
5	1965	-43	2011	72	5	1969	-91	2003	132
6	1966	-43	1992	71	6	2004	-87	1978	126
7	1972	-42	1983	63	7	1968	-83	2006	118
8	2004	-39	1973	58	8	1999	-82	1967	92
9	1969	-38	2003	54	9	1980	-79	1970	83
10	1974	-37	1975	49	10	1996	-78	1976	81

Figure-2 depicts the spatial distribution of actual, normal & departure from normal rainfall during the season. Stations' rainfall actual along with its corresponding normal and departure values for each month of the monsoon season 2011 and for whole season are given in Table-7.

The heavy rainfall & cloud bursts during the months of August & September caused sever flooding specially in the major part of Sindh province. Due to these floods several cities, towns, villages and land covering the area of 6.687 millions acres were inundated. Standing crop on an area of 2.166 million acres, cattle and poultry farms were destroyed. Due to floods trees, house roofs and transmission lines/poles fell in the affected areas. According to National Disaster Management Authority (NDMA) reports, heavy rain and floods took a toll of 449 lives besides affecting 8.943 million people. It may be recalled, that the monsoon rainfall during last year, over whole country, was excess of 87 per cent and was highest since 1994 and ranked second highest during last 50 years of period. These unusual & heavy downpours led to flash flooding in the area and had also caused damage to crops, property and took several of lives.

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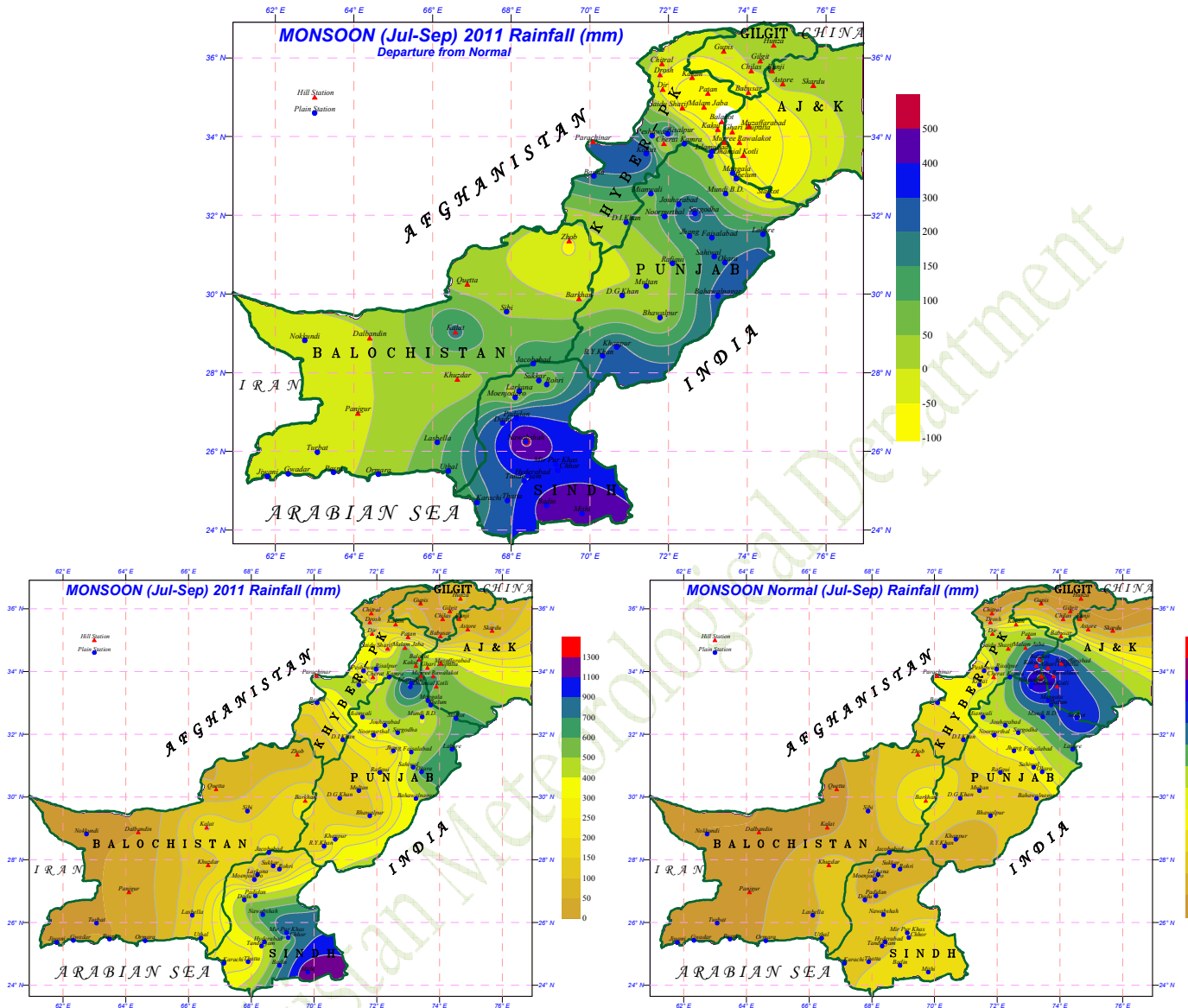


Fig.2: Distribution of seasonal Rainfall

JULY 2011

In Pakistan, July is the wettest month of the monsoon season. The percentage rainfall contribution for the month of July to monsoon season rainfall has been found to be generally 45.

Four westerly low-pressure waves passed across northern parts of the country from 1st to 5th, 7th to 11th, 14th to 19th, 22nd to 24th & 26th to 31st. A monsoon low moved westwards from India and affected Sindh and adjoining Balochistan from 25th to 27th, July. Monsoon currents also penetrated into Northern and Central parts of the country during the month. Under the influence of these systems rain/thundershowers, with a few moderate to heavy and isolated very heavy fall, have occurred at a number of places almost at all the places in northern parts of the country and at a few places in southern parts of the country during the month.

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On the national scale, in July, slightly below normal (-18%) rain was recorded. Table-4 shows the rainfall deviation from normal (1961-1990) during July over the provinces; Khyber-Pakhtunkhwa (1%) and Punjab (1%) was minimal whereas, Balochistan & Sindh were largely in deficit i.e. -36% & -72%, respectively. Figure-3 depicts the distribution of July rainfall over the country.

Table-4

Region	Area Weighted July Rainfall (mm)		Percentage Departure
	Normal	2011	
Pakistan	62.5	51.4	-18
Khyber-PK	95.4	96.2	1
Punjab	108.4	109.7	1
Balochistan	28.6	18.2	-36
Sindh	56.9	15.9	-72

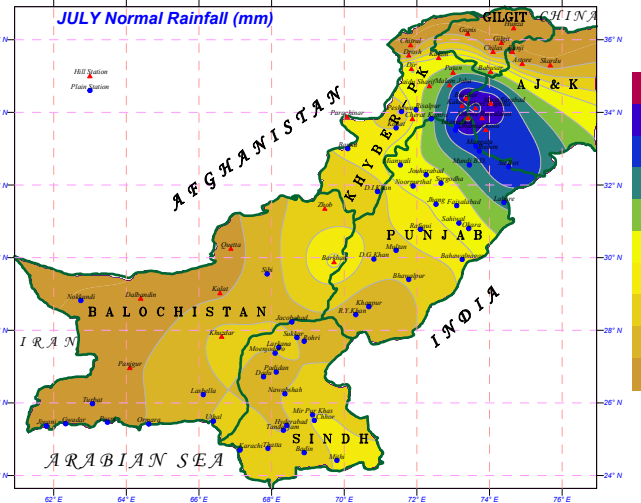
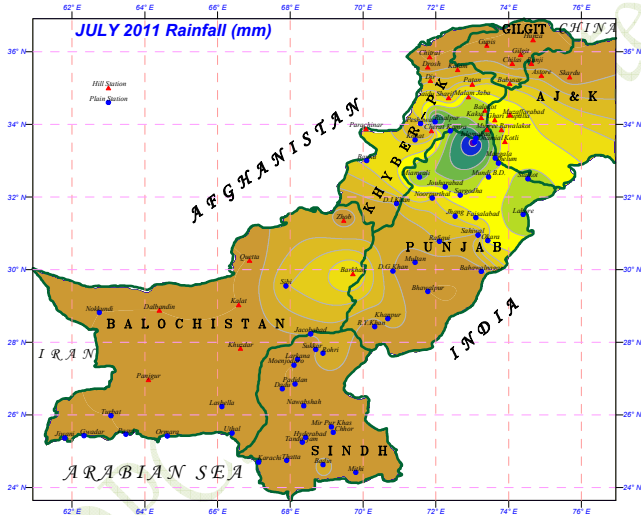
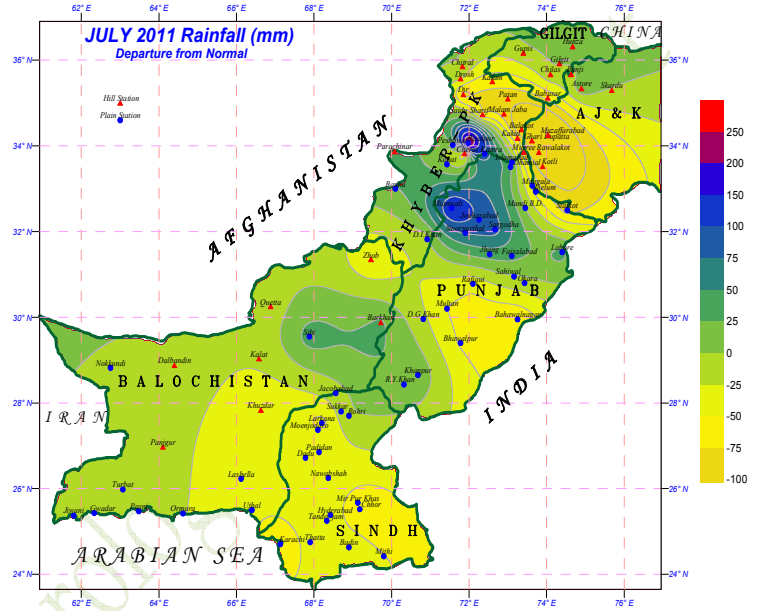


Fig.3: Distribution of July 2011 rainfall

AUGUST-2011

August is also one of the wettest months of monsoon season. The rainfall contribution for the month of August to monsoon season is 45%. Four westerly low-pressure waves passed across northern parts of the country from 7th to 9th, 11th to 16th, 18th to 23rd & 25th to 31st, August.

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Table-5

Region	Area Weighted August Rainfall		Percentage Departure
	Normal	2011	
Pakistan	55.4	88.0	59
Khyber-PK	94.0	102.3	9
Punjab	93.6	109.1	17
Balochistan	23.0	28.0	22
Sindh	52.4	194.6	271

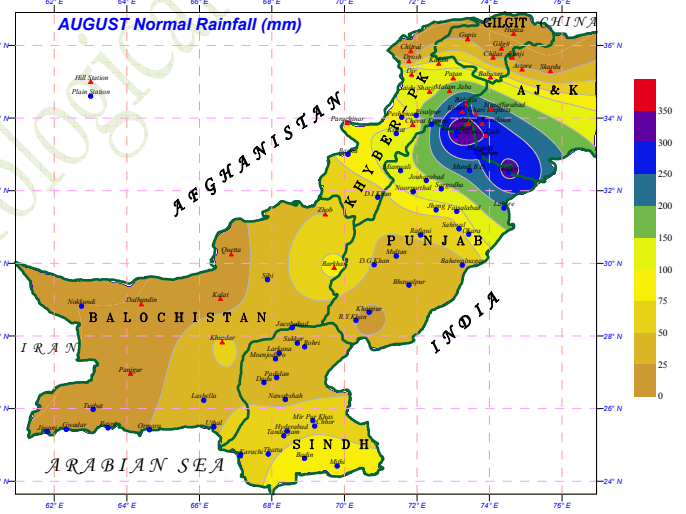
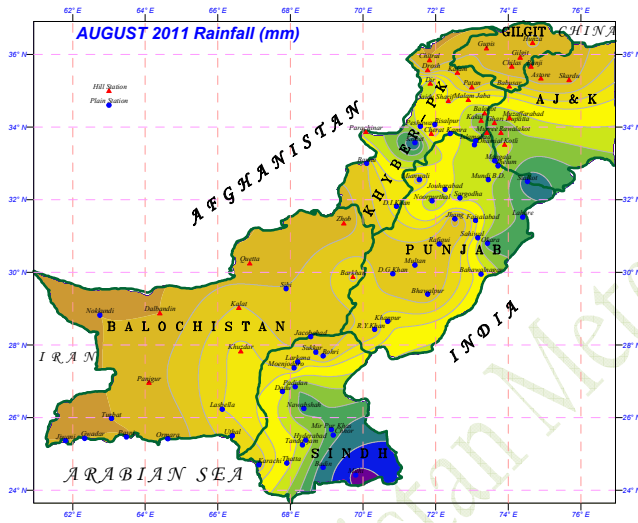
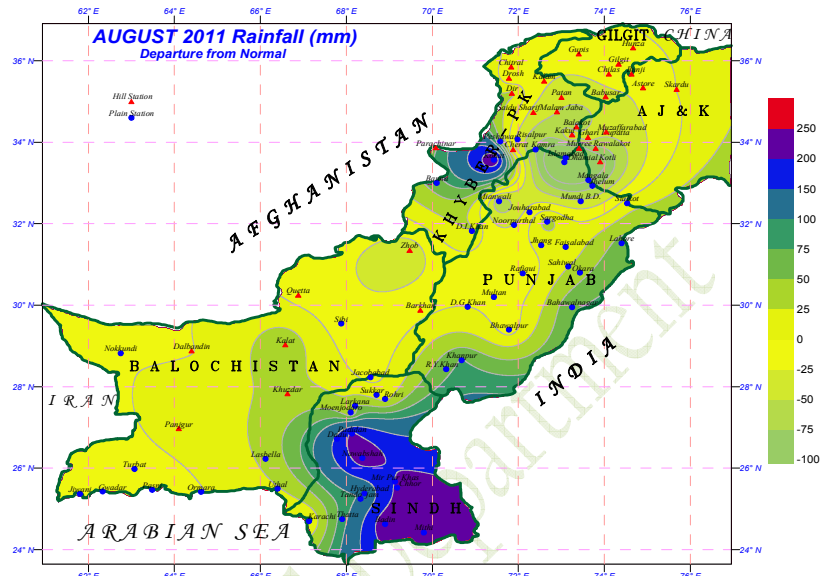


Fig.4: Distribution of August 2011 rainfall

A series of strong monsoon lows moved westwards, from India, towards Sindh and caused widespread heavy to very heavy rain/thundershowers and strong gusty winds, particularly in Sindh and to some extent in South Punjab and East Balochistan from 2nd week of August to the end of the month, with intervals. Monsoon currents also penetrated into northern and central parts of the country on most of the days, during the month. Under the combined influence of westerly waves and monsoon currents, rain/thundershowers with a few moderate to heavy falls and gusty winds, also occurred in northern parts of the country on most of the days during the month.

The monsoon activity was intensified during August over the country, especially south eastern parts, where monthly rainfall was +271% above normal in the province of Sindh, as evident in the Figure-4. As indicated in Table-5, the August rainfall was almost normal over Khyber-

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Pakhtonkwa (9%) and slightly above normal over Punjab (17%) & Balochistan (22%). The August monsoon rainfall, over province of Sindh (271 % above normal) is the heaviest recorded during the period 1961-2011.

SEPTEMBER 2011

Generally the month of September is not like the remaining two wettest months of the season and hence normally its contribution to the season is less. Four westerly low-pressure waves passed across northern parts of the country from 1st to 5th, 9th to 10th, 12th to 16th and 19th to 20th, September.

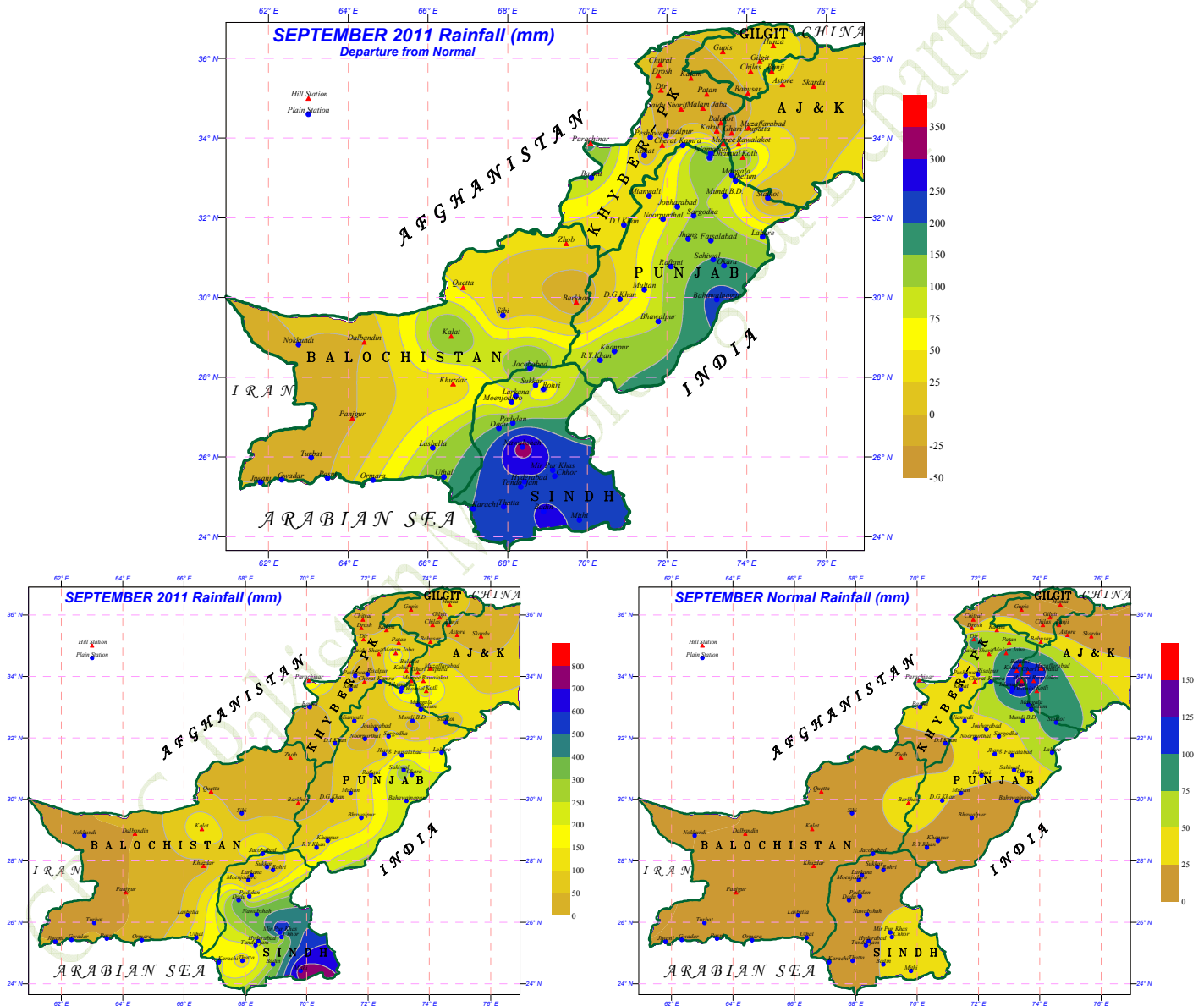


Fig.5: Distribution of September 2011 rainfall

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A series of strong monsoon lows moved westwards, from India, towards Sindh and resulted in widespread heavy to very heavy rain/thundershowers, with gusty winds in Sindh and at a few places in South Punjab and East Balochistan, mostly during the first fortnight of the month. Monsoon currents also penetrated into northern and central parts of the country during first three weeks of the month. Under the combined influence of westerly waves and monsoon currents rain/thundershowers, with a few moderate to heavy falls, have also occurred in northern parts of the country on a number of day during first three weeks of the month i.e. September 2011. During the month under review, the monsoon activity became more intense over most areas of the country, as shown in Figure-5. On whole country basis, the monthly rainfall was again excessively above normal and reached upto 308%. More or less similar conditions were observed on its provinces too, where monthly rainfall was +1182% in the province of Sindh, 42% over Khyber-Pakhtunkhwa, 286% over Punjab & 395% over Balochistan (Table-6). Again the September rainfall, over province of Sindh was the heaviest recorded during the period 1961-2011.

Table-6

<i>Region</i>	<i>Area Weighted September Rainfall (mm)</i>		<i>Percentage Departure</i>
	<i>Normal</i>	<i>2011</i>	
<i>Pakistan</i>	19.5	97.0	398
<i>Khyber-PK</i>	35.8	50.7	42
<i>Punjab</i>	33.7	130.0	286
<i>Balochistan</i>	7.2	35.7	395
<i>Sindh</i>	18.2	233.4	1182

Acknowledgment

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Table-7 MONSOON 2011 RAINFALL (mm)

Stations	July			August			September			Monsoon Season		
	Actual	Normal	Dep	Actual	Normal	Dep	Actual	Normal	Dep	Actual	Normal	Dep
Astore	41.1	25.5	15.6	9.3	28.9	-19.6	44.1	21.6	22.5	94.5	76.0	18.5
Badin	31.4	67.6	-36.2	331.2	92.6	238.6	284.1	27.1	257.0	646.7	187.3	459.4
Balakot	228.3	372.0	-143.7	188.5	271.1	-82.6	77.2	113.2	-36.0	494.0	756.3	-262.3
Bannu	108.0	----	----	46.2	----	----	22.1	----	----	176.3	----	----
Barkhan	138.0	109.3	28.7	81.1	87.7	-6.6	14.1	44.5	-30.4	233.2	241.5	-8.3
Bhawalnagar	11.0	83.0	-72.0	115.1	43.2	71.9	242.1	13.4	228.7	368.2	139.6	228.6
Bhawalpur	0.2	53.6	-53.4	30.8	42.9	-12.1	105.2	12.4	92.8	136.2	108.9	27.3
Bunji	9.5	18.9	-9.4	5.0	21.5	-16.5	51.2	10.7	40.5	65.7	51.1	14.6
Cherat	57.0	93.4	-36.4	81.0	96.4	-15.4	57.0	34.5	22.5	195.0	224.3	-29.3
Chhor	8.0	79.3	-71.3	276.0	69.4	206.6	268.0	37.3	230.7	552.0	186.0	366.0
Chilas	8.3	14.1	-5.8	2.3	16.9	-14.6	24.0	7.8	16.2	34.6	38.8	-4.2
Chitral	0.0	5.5	-5.5	2.0	6.6	-4.6	7.0	13.4	-6.4	9.0	25.5	-16.5
Dadu	3.0	----	----	134.1	----	----	348.1	----	----	485.2	----	----
Dahmial	593.0	----	----	174.1	----	----	195.1	----	----	962.2	----	----
Dalbandin	0.0	2.6	-2.6	0.0	1.0	-1.0	0.0	0.2	-0.2	0.0	3.8	-3.8
D-G-Khan	24.3	----	----	24.5	----	----	53.0	----	----	101.8	----	----
D-I-Khan (AP)	55.0	60.5	-5.5	89.1	61.7	27.4	54.3	20.8	33.5	198.4	143.0	55.4
Dir	72.1	154.1	-82.0	186.0	156.0	30.0	74.0	90.6	-16.6	332.1	400.7	-68.6
Drosh	1.1	22.1	-21.0	2.0	20.1	-18.1	14.2	21.8	-7.6	17.3	64.0	-46.7
Faisalabad	150.0	117.0	33.0	90.2	84.7	5.5	165.0	37.7	127.3	405.2	239.4	165.8
Garhi Dupatta	159.0	265.6	-106.6	203.0	235.8	-32.8	67.0	104.3	-37.3	429.0	605.7	-176.7
Gawadar	0.0	----	----	0.0	----	----	0.0	----	----	0.0	----	----
Gilgit	16.7	16.2	0.5	12.0	17.0	-5.0	35.0	8.5	26.5	63.7	41.7	22.0
Gupis	6.0	14.0	-8.0	10.0	23.8	-13.8	18.0	11.8	6.2	34.0	49.6	-15.6
Hunza	16.0	----	----	31.6	----	----	67.2	----	----	114.8	----	----
Hyderabad	7.0	45.5	-38.5	162.2	63.1	99.1	244.2	12.7	231.5	413.4	121.3	292.1
Islamabad (AP)	335.2	305.3	29.9	164.2	348.1	-183.9	282.4	113.2	169.2	781.8	766.6	15.2
Jacobabad	31.0	42.8	-11.8	29.2	35.4	-6.2	183.1	11.1	172.0	243.3	89.3	154.0
Jhang	100.0	----	----	12.1	----	----	74.1	----	----	186.2	----	----
Jhelum	205.3	263.2	-57.9	170.8	251.7	-80.9	140.2	74.5	65.7	516.3	589.4	-73.1
Jiwani	0.0	8.6	-8.6	0.0	2.1	-2.1	0.0	0.3	-0.3	0.0	11.0	-11.0
Joharabad	217.0	----	----	131.0	----	----	24.0	----	----	372.0	----	----
Kakul	195.2	263.6	-68.4	257.0	266.5	-9.5	88.1	104.3	-16.2	540.3	634.4	-94.1
Kalam	17.0	----	----	34.0	----	----	60.1	----	----	111.1	----	----
Kalat	0.0	20.2	-20.2	53.0	9.1	43.9	155.0	2.1	152.9	208.0	31.4	176.6
Kamra	228.1	----	----	120.1	----	----	59.2	----	----	407.4	----	----
Karachi (Airport)	7.7	66.3	-58.6	61.1	60.1	1.0	212.2	10.2	202.0	281.0	136.6	144.4
Khanpur	45.0	25.8	19.2	94.4	17.5	76.9	140.3	14.6	125.7	279.7	57.9	221.8
Khuzdar	12.2	60.5	-48.3	86.1	57.4	28.7	32.0	7.9	24.1	130.3	125.8	4.5
Kohat	79.3	75.3	4.0	373.1	115.6	257.5	55.1	42.2	12.9	507.5	233.1	274.4
Kotli	170.0	285.8	-115.8	181.1	297.6	-116.5	228.1	92.1	136.0	579.2	675.5	-96.3
Lahore (PBO)	245.2	212.1	33.1	255.1	194.5	60.6	154.5	65.1	89.4	654.8	471.7	183.1
Larkana	10.2	69.4	-59.2	83.2	31.2	52.0	79.0	5.5	73.5	172.4	106.1	66.3
Lasbella	9.0	----	----	75.0	----	----	65.1	----	----	149.1	----	----
Malam Jaba	219.0	----	----	129.0	----	----	220.0	----	----	568.0	----	----
Mandi Bhauddin	164.7	----	----	192.4	----	----	16.0	----	----	373.1	----	----

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Stations	July			August			September			Monsoon Season		
	Actual	Normal	Dep	Actual	Normal	Dep	Actual	Normal	Dep	Actual	Normal	Dep
Mangla	197.2	----	----	212.5	----	----	146.3	----	----	556.0	----	----
Mianwali	271.4	134.8	136.6	55.3	130.2	-74.9	80.2	50.3	29.9	406.9	315.3	91.6
Mir Pur Khas	0.1	----	----	263.1	----	----	603.0	----	----	866.2	----	----
Mithi	9.0	----	----	562.6	----	----	776.1	----	----	1347.9	----	----
Moenjo Daro	0.0	44.8	-44.8	53.0	31.0	22.0	48.1	6.7	41.4	101.1	82.5	18.6
Multan	10.5	60.3	-49.8	31.5	36.4	-4.9	85.3	25.0	60.3	127.3	121.7	5.6
Murree	265.4	364.1	-98.7	216.2	335.5	-119.3	137.5	143.1	-5.6	619.1	842.7	-223.6
Muzaffarabad	201.2	359.4	-158.2	184.0	227.4	-43.4	119.4	108.1	11.3	504.6	694.9	-190.3
Nawabshah	22.0	51.0	-29.0	275.2	46.3	228.9	353.2	16.2	337.0	650.4	113.5	536.9
Nokkundi	0.0	2.0	-2.0	0.0	0.4	-0.4	0.0	0.0	0.0	0.0	2.4	-2.4
Noorpur thal	98.1	----	----	219.1	----	----	23.2	----	----	340.4	----	----
Okara	161.3	----	----	280.0	----	----	216.0	----	----	657.3	----	----
Ormara	6.0	----	----	1.0	----	----	13.0	----	----	20.0	----	----
Padidan	0.2	40.5	-40.3	251.2	40.5	210.7	172.0	12.6	159.4	423.4	93.6	329.8
Parchinar	145.0	99.4	45.6	170.0	97.4	72.6	223.1	55.4	167.7	538.1	252.2	285.9
Pasni	0.0	5.0	-5.0	0.0	11.5	-11.5	0.0	1.3	-1.3	0.0	17.8	-17.8
Pattan	82.0	----	----	33.0	----	----	55.1	----	----	170.1	----	----
Peshawar	58.3	46.1	12.2	122.1	72.6	49.5	38.3	22.2	16.1	218.7	140.9	77.8
Punjgar	7.0	21.2	-14.2	16.0	7.4	8.6	0.0	2.5	-2.5	23.0	31.1	-8.1
Quetta	1.1	16.3	-15.2	5.0	13.2	-8.2	47.0	2.5	44.5	53.1	32.0	21.1
Rafiqi	54.3	97.4	-43.1	37.5	54.8	-17.3	143.1	29.4	113.7	234.9	181.6	53.3
Rahim Yar Khan	1.1	----	----	57.5	----	----	116.1	----	----	174.7	----	----
Rawalakot	211.2	----	----	257.0	----	----	164.4	----	----	632.6	----	----
Risalpur	415.6	132.4	283.2	111.4	143.1	-31.7	30.3	47.5	-17.2	557.3	323.0	234.3
Rohri	42.0	45.5	-3.5	42.2	25.1	17.1	49.0	11.8	37.2	133.2	82.4	50.8
Sahiwal	41.2	----	----	120.4	----	----	296.0	----	----	457.6	----	----
Saidu Sharif	82.7	152.6	-69.9	92.0	125.9	-33.9	54.0	68.1	-14.1	228.7	346.6	-117.9
Sargodha (PAF)	198.0	113.6	84.4	170.2	131.7	38.5	131.2	27.7	103.5	499.4	273.0	226.4
Sialkot	218.7	304.1	-85.4	335.4	323.5	11.9	69.1	90.7	-21.6	623.2	718.3	-95.1
Sibbi	74.1	37.4	36.7	26.2	37.2	-11.0	24.0	9.0	15.0	124.3	83.6	40.7
Skardu	9.0	11.3	-2.3	14.8	14.2	0.6	20.6	8.7	11.9	44.4	34.2	10.2
Sukkar	8.0	----	----	47.0	----	----	48.0	----	----	103.0	----	----
Thatta	0.0	----	----	131.0	----	----	114.0	----	----	245.0	----	----
Turbat	0.0	----	----	0.0	----	----	0.0	----	----	0.0	----	----
Zhob	13.0	61.1	-48.1	10.0	49.7	-39.7	42.0	11.5	30.5	65.0	122.3	-57.3

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