

Pakistan Meteorological Department

Drought Bulletin of Pakistan July-September 2013



National Drought Monitoring Centre

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Drought Bulletin

July – September ,2013

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Quarterly Drought Bulletin **July – September ,2013**

By

National Drought/Environment Monitoring & Early Warning Centre,
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1. Introduction

Pakistan has a long latitudinal extent and the rainfall variability during different seasons is considerably high. The climate of the country in its lower southern half is arid and hyper-arid. Some regions of the country in each seasons, remain drastically dry and area always vulnerable to drought. If subsequent seasons fail to generate significant precipitation, the drought conditions then are sure to take the vulnerable regions in the grip. All the provinces of Pakistan have a history of facing major droughts in the past.

Drought differs from other natural disaster (e.g. flood, tropical cyclones, tornadoes and earthquakes etc) in the sense that the effects of drought often accumulate slowly over a considerable period of time and may linger for years even after the termination of the event. Because of this drought is often referred to as a “Creeping Phenomena”. Drought impacts are less obvious and are spread over large geographical areas than are the damages that results from other natural hazards. Consequently drought affects more people than any other environmental hazard.

Unfortunately, no organizations dealing with the drought issues exist in Pakistan and the responses to drought for the distressed economic and social sector, whenever such situation arose, were taken on emergency and on adhoc basis. It is thus inevitable need of the time and Pakistan Meteorological Department (PMD) took an initiative to establish National Drought/Environment monitoring and Early Warning Centre (NDMC) in 2004-05 after the worst drought during 1999-2001 in Pakistan. The main objective is to monitor on drought situation in the country and issue advisory before time. Its national centre is in Islamabad which covers almost 25 canals adjacent to the existing Pakistan Meteorological Head office while four Regional Drought Monitoring Centers (RDMC's) are in Lahore, Karachi, Peshawar and Quetta. These four RDMC's cover those region which comes under their jurisdiction. These centers serve as a hub for the collection, consolidation

and analysis of drought related data from all the possible sources in the country. In order to strength the network, 50 Automatic weather stations (AWS) have been installed in different regions particularly the drought prone areas of the country. The data of eleven meteorological parameters (air temperature, humidity, wind speed, wind direction, dew point, sea level pressure, station level pressure, solar radiations, soil moisture at standard depths(5,10,20,50,100) and snow level are transmitted through satellite and GPRS technology after 3 hours. So, it has now become easy to access the data of remote areas of the country. NDMC has installed 335 Ordinary Rainguages have been installed at districts level in four provinces as shown in figure-1

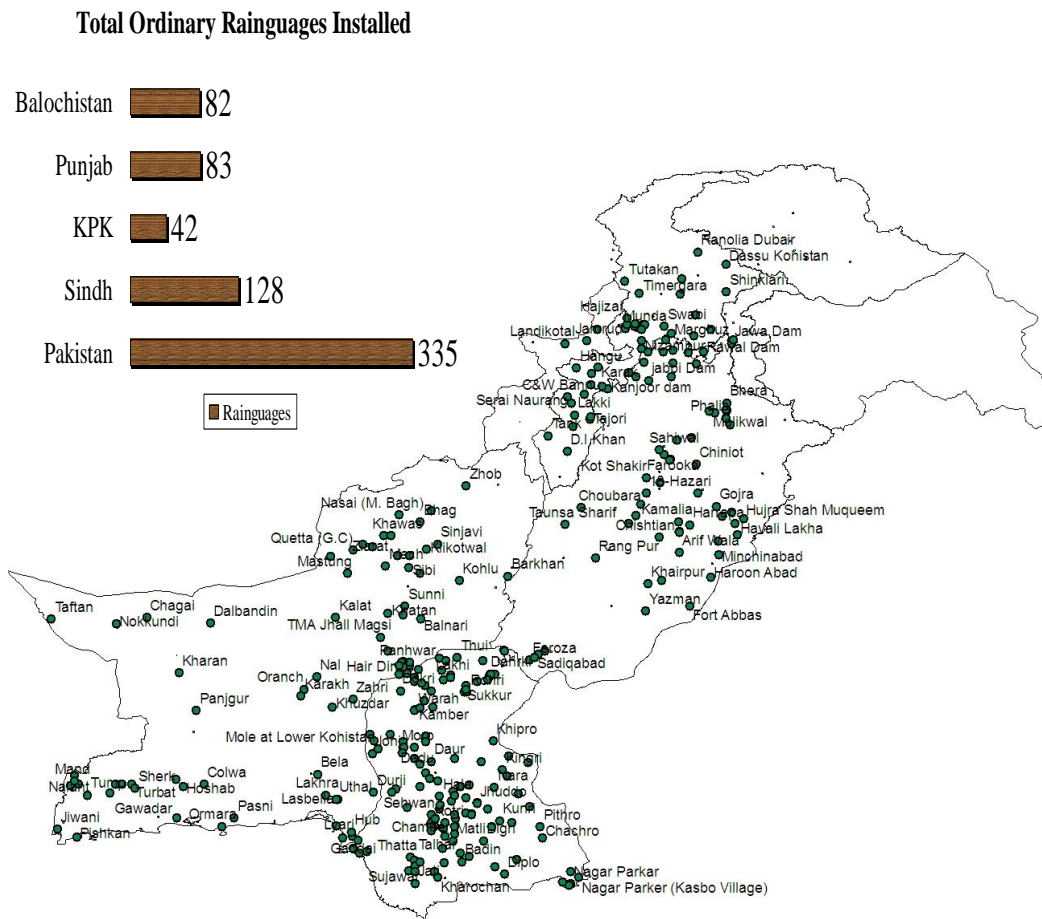


Figure-1 Rain-gauges Network of Pakistan by NDMC

NDMC also monitoring the water level situation of small dams in Barani areas of the country. NDMC using different indices like SPI, NDVI, CPA, RAI, Percent of normal, Probability of occurrence, Percentage departure and soil moisture analysis etc to monitor drought. NDMC issues fortnightly drought bulletin in different regions of the country especially the drought vulnerable

areas. Negotiations are underway with NGO's and National Disaster Management Authority (NDMA) for utilization of drought advisories / bulletin to end users.

2. Historical Background.

The Indian sub-continent is predominantly characterized by a tropical monsoon climate and entire regime is distinguished mainly by the differences in rainfall both in quantity and distribution. The most important feature is the regional and temporal alteration of atmospheric flow patterns associated with monsoon. There are two rainfall systems operating in the region (a) the southwest or summer monsoon and (b) the northeast or the winter monsoon.

Fortunately Pakistan also falls in this region which receive heavy amount of rainfall in summer due to SW monsoon and in winter due to western disturbances. The summer monsoon accounts for 70 to 80% of the annual rainfall over major parts of South Asia (IMD, 2009). In Pakistan, summer monsoon accounts 60 to 70% of the annual rainfall during July to September (Chaudhry, 1992). There is a large variability in the monsoon rainfall on both space and time scales.

Droughts in Pakistan region are mainly due to various kinds of failures of rains from southwest monsoon. Also there seems to be some association between El Nino and La Nina events and weak monsoons. Pakistan frequently experiences several droughts. The Punjab province experienced the worst droughts in 1899, 1920 and 1935. Khyber Pakhtunkhwa (KPK) experienced the worst droughts in 1902 and 1951, while Sindh had its worst droughts in 1871, 1881,1899,1931,1947 and 1999. Over more than hundred year's period between 1871-1988, 11 out of 21 drought years were El Nino years. The El Nino phase of the Southern Oscillations (ENSO) has direct impact on drought in Pakistan as it poses mainly negative impact on summer monsoon.

Due to climate change, wet and dry cycles some years we receive more rains in wet spell and in dry spell we receive less rain. Due to less rain we have drought and heavy rain we have floods (flash flood, urban flood, costal flood and river flood)

3. Monsoon 2013

- **Rainfall Distribution (July-September) 2013**

During Third quarter of the year (July-September) 2013, Normal (11 %) precipitation was observed over Pakistan. During the quarter high temporal and spatial variable precipitation was observed. Normally July and August are the wettest months in the country and this year heavy spell of rainfall observed during the month of August and it was the wettest month in the country This heavy rainfall developed the flash flood situation in hill torrents region in the country while

some of the urban cities (Lahore, Karachi, Sialkot, Peshawar, Noshera) were also influenced urban flooding. In August 2013, the country received good amount of rainfall which overcome the moisture stress conditions of July 2013. These monsoonal rainfalls lessen the moisture stress in the country along with some strong winds. The evaporation rate was less as compare to the previous quarter. Pakistan Meteorological department predicated normal rainfall in their seasonal outlook during this quarter.

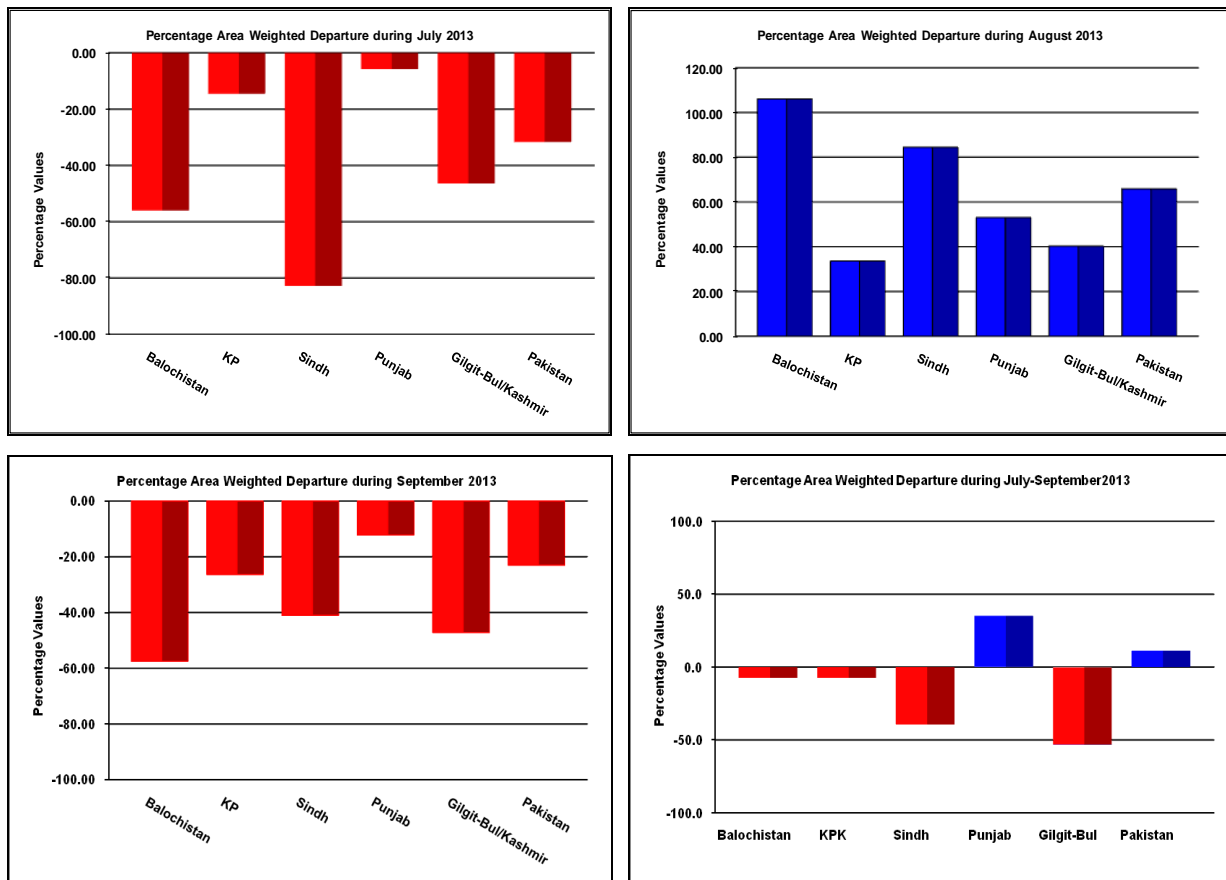


Figure-2 Percentage departure of rainfall during (July-September) 2013

During July 2013, 32% below normal rainfall received in the country and in Sindh it was almost -83%. Rainfall received in Balochistan (-56%), Gilgit-Baltistan (-46%), and KP (-15%) respectively. During August 2013, rainfall again in the country was well above normal (66%) the maximum of which was in Balochistan (106%), Sindh (84%), Punjab (53%), Gilgit-Baltistan and Kashmir (40%) and KP (34%). During September 2013, Amount of rainfall was below normal in the country (-23%), Maximum below normal rainfall was observed in Balochistan (-57%), Gilgit-Baltistan and Kashmir (-47%), Sindh (-41%) and KP (-26%), while in Punjab it was normal.

The figures-2 shows percentage area weighed departure rainfall occurred during (July-September) 2013. The amount of rainfall was normal (11%) in the country during 3rd quarter of the year. Viewing the rainfall distribution on province basis, over Punjab, it was above-normal (35%) while well below normal in Gilgit-Baltistan and Kashmir (-53%), Sindh (-39%). however normal rainfall observed in Balochistan, Khyber-Pakhtunkhaw. The spatial distribution of monthly and seasonal analyses of Pakistan is as shown below in figure-3.

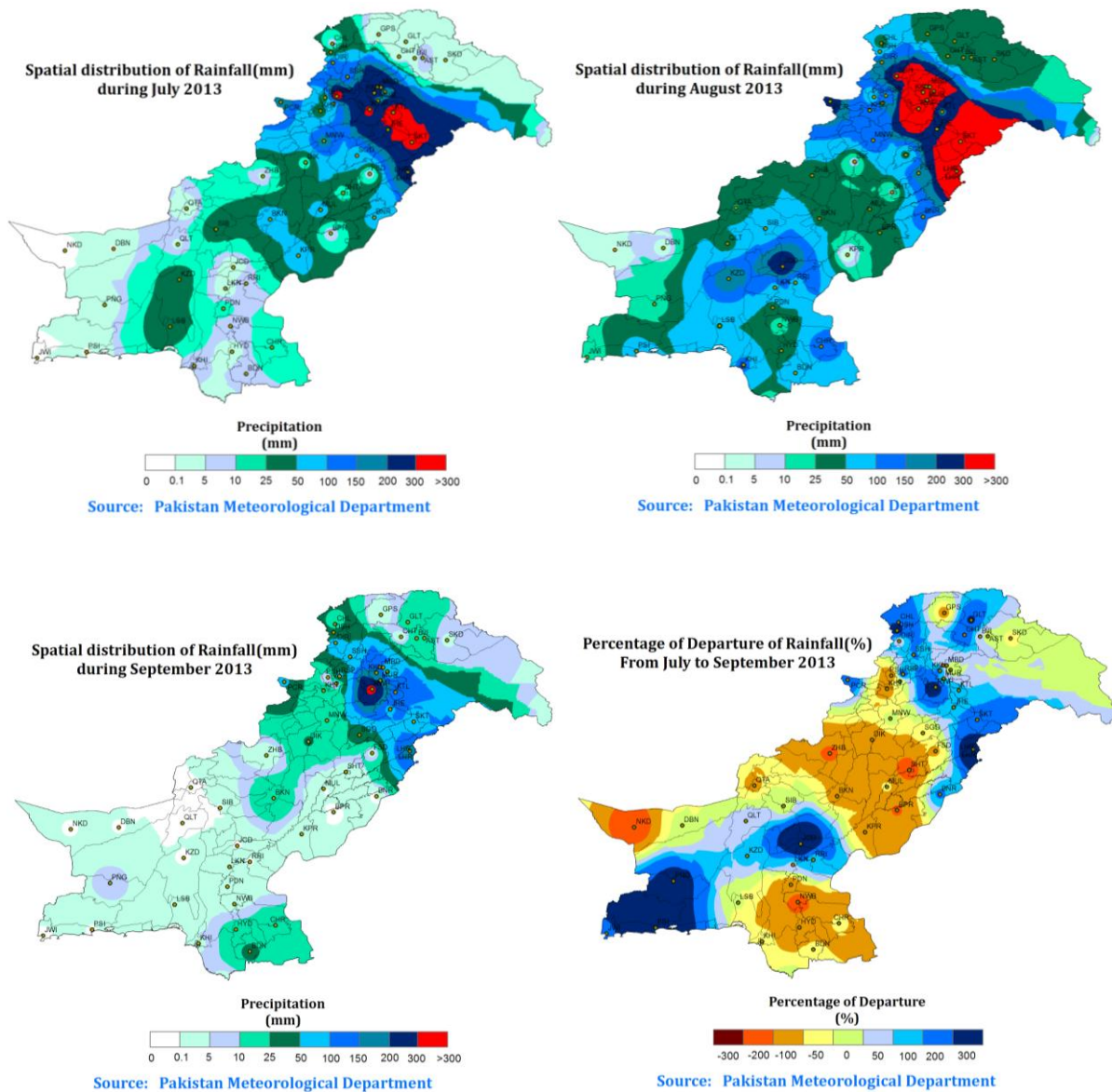
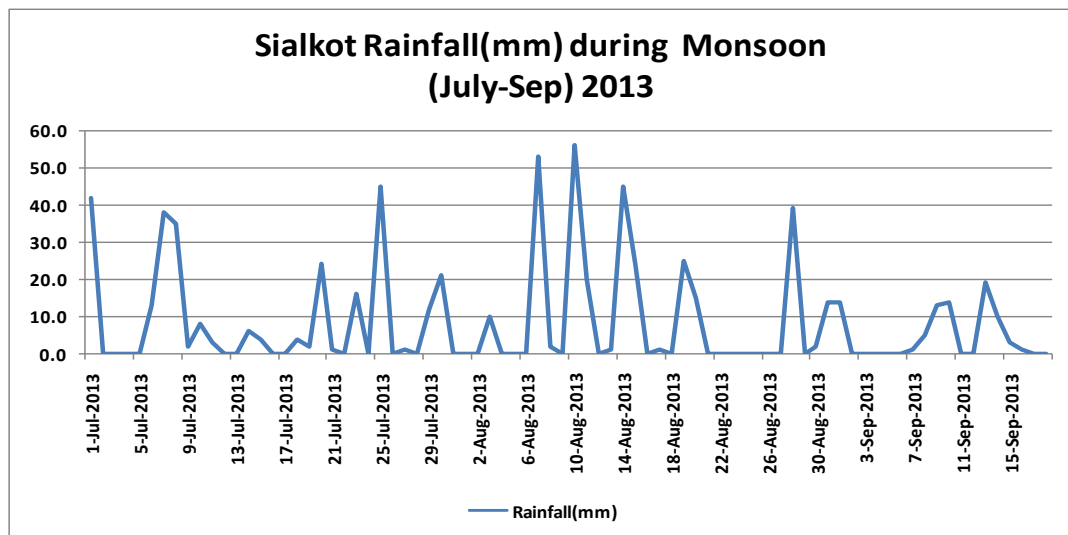
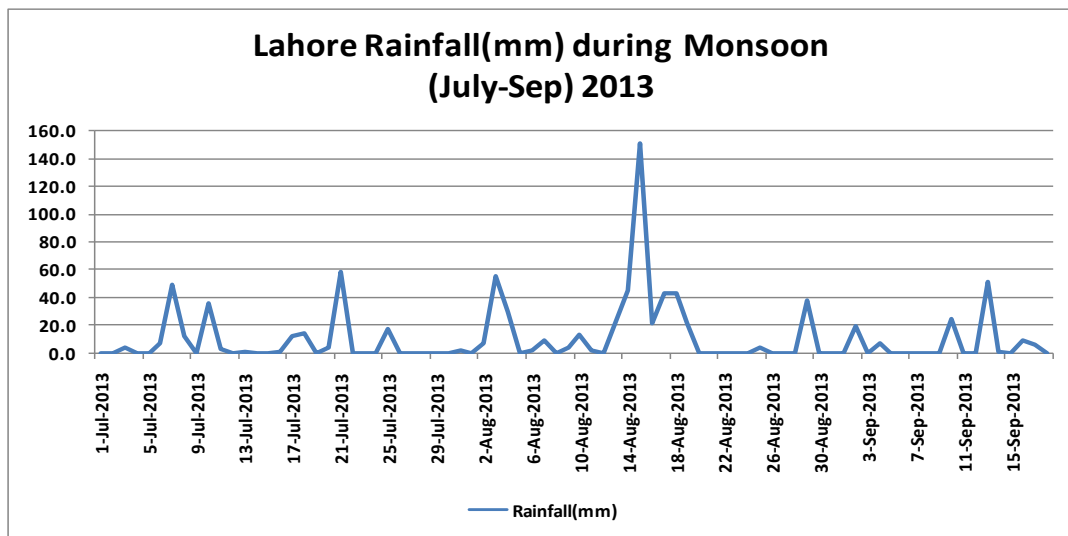
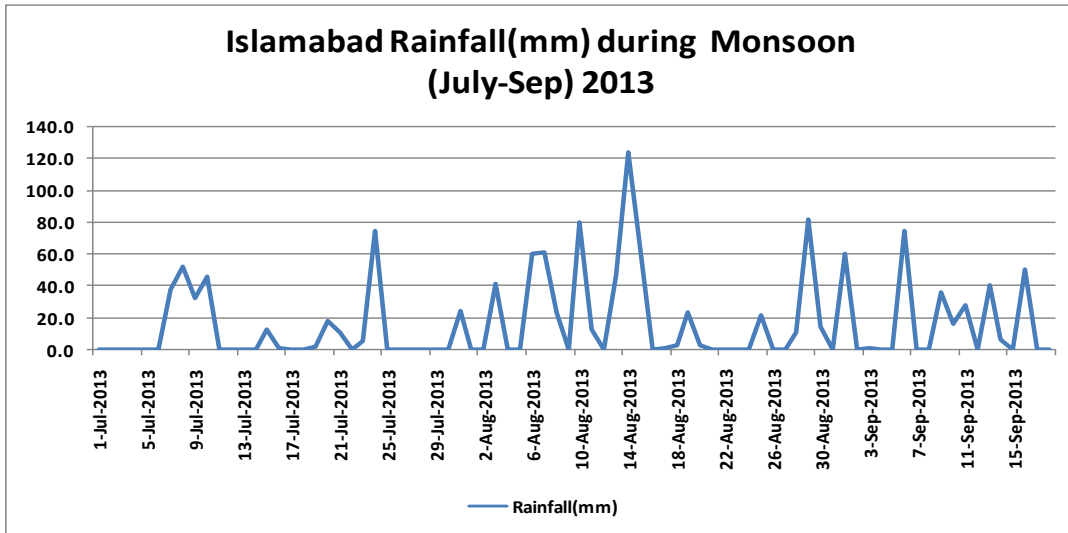
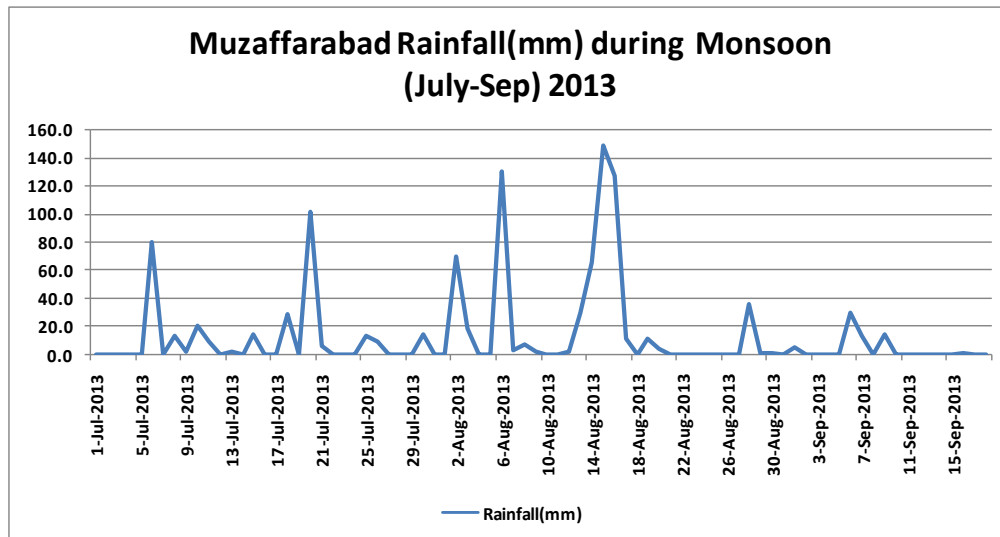


Figure-3 Spatial distribution of rainfall during (July-September) 2013

Comparing the daily intensities of rainfall and number of rainy days during the period, it depicts that monsoon systems were fairly deep enough to precipitate in somewhat cloud burst proportion especially over Islamabad, Sialkot, Lahore and Muzaffarabad areas during July to September 2013 and as depicted in following graphs.





- **Rainfall spell**

- ***July-2013***

Light rain showers in wide spread spells were observed in July, 2013. However, Khyber Pakhtunkhwa, Gilgit/Baltistan and Azad Kashmir received slightly higher rainfall than Punjab, Sindh and Balochistan. Variable monsoon systems across different provinces observed in July-2013.

In Punjab, five distinct spells of rains were observed during 6-11, 14-15, 17- 18, 19-21 and 24-26 July. In Sindh, two distinct spells of rains were observed during 4-7 and 12-15 July while in Khyber Pakhtunkhwa, two distinct spells of rains were observed during 6-12 and 14-18 July. Balochistan has received the least monsoon rainfall during 10-14 July 2013.

- ***August-2013***

Wide spread spells of rains were observed during August, 2013. Khyber Pakhtunkhwa, Gilgit/Baltistan and Azad Kashmir received slightly higher rainfall than Punjab, Sindh and Balochistan. Monsoon rain events have caused flooding in river Indus, Chenab and Sutlej within the river bed. Flash floods in Nullah Aik and Deakh have been recorded in major Basmati rice growing areas.

This month witnessed above normal monsoon systems across provinces. In Punjab, three distinct spells of rains were observed during 2-4, 6-7 and 11- 18 August. In Sindh, two distinct spells of rains were observed during 3-4 and 14-15 August while in Khyber Pakhtunkhwa, three distinct spells of rains were observed during 2-3, 6-8 and 10-15 July. Balochistan has received rain spells during 2-5 and 8-15 August, 2013, but intensity was much less as compared to Sindh and Punjab.

➤ **September-2013**

Three wide spread spells of rain 1-3, 13-16 and 27-30 September, 2013 were observed. Khyber Pakhtunkhwa, Gilgit/Baltistan and Azad Kashmir received slightly higher rainfall than Punjab, Sindh and Balochistan.

• **Rainy days**

Rainy Days of Punjab										
S.No.	Station Name	Normal (1971-2000)				2013				2012
		July	August	September	July-Sep	July	August	September	July-Sep	July-Sep
1	Bhawalnagar	6.2	4.1	2.2	4.2	2.0	4.0	0.0	2.0	4.3
2	Bhawalpure	4.1	2.5	0.9	2.5	1.0	4.0	0.0	1.7	1.7
3	Faisalabad	7.4	5.6	2.8	5.3	1.0	4.0	0.0	1.7	4.3
4	Islamabad	15.3	16.3	8.3	13.3	10.0	16.0	8.0	11.3	8.0
5	Jhelum	15.3	14.8	7.1	12.4	13.0	10.0	4.0	9.0	9.0
6	Khanpur	2.6	1.8	1.2	1.9	1.0	0.0	0.0	0.3	2.3
7	Lahore	13.6	11.9	6.0	10.5	11.0	15.0	6.0	10.7	4.3
8	Mianwali	9.6	8.3	4.4	7.4	7.0	3.0	2.0	4.0	3.7
9	Multan	4.4	3.5	1.7	3.2	2.0	3.0	0.0	1.7	3.7
10	Murree	19.5	18.3	9.8	15.9	12.0	16.0	9.0	12.3	12.7
11	Sargoda	9.5	8.9	4.3	7.6	6.0	4.0	2.0	4.0	4.7
12	Sialkot	15.1	14.2	6.8	12.0	11.0	13.0	4.0	9.3	8.0
13	Shorkot	7.1	6.0	2.4	5.2	2.0	2.0	0.0	1.3	3.7

Rainy Days of Sindh										
S.No.	Station Name	Normal (1971-2000)				2013				2012
		July	August	September	July-Sep	July	August	September	July-Sep	July-Sep
1	Badin	2.2	2.6	0.9	1.9	2.0	3.0	0.0	1.7	2.3
2	Chorr	3.3	3.2	1.4	2.6	2.0	2.0	0.0	1.3	3.3
3	Hyderabad	2.0	2.4	0.8	1.7	0.0	1.0	0.0	0.3	1.3
4	Jacobabad	2.1	1.3	0.4	1.3	0.0	5.0	0.0	1.7	1.7
5	Karachi	3.4	2.8	0.8	2.3	0.0	1.0	0.0	0.3	2.7
6	Larkana	1.5	1.5	0.1	1.0	0.0	3.0	0.0	1.0	1.7
7	Moenjodaro	1.8	1.5	0.4	1.2	0.0	2.0	0.0	0.7	2.0
8	Shaheed Banazirabad	1.3	1.6	1.0	1.3	1.0	2.0	0.0	1.0	2.3
9	Padidan	2.5	2.0	0.6	1.7	1.0	2.0	0.0	1.0	2.3
10	Rohri	1.8	1.2	0.5	1.2	1.0	3.0	0.0	1.3	1.3

Rainy Days of Balochistan

S.No.	Station Name	Normal (1971-2000)				2013				2012
		July	August	September	July-Sep	July	August	September	July-Sep	July-Sep
1	Barkhan	8.3	4.9	3.3	16.5	6.0	3.0	0.0	3.0	14.0
2	Dalbandi	0.2	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
3	Jiwani	0.2	0.5	0.1	0.8	0.0	1.0	0.0	0.3	0.0
4	Kalat	2.2	1.1	0.3	3.6	1.0	1.0	0.0	0.7	3.0
5	Khuzdar	0.5	3.4	1.5	5.4	7.0	9.0	0.0	5.3	6.0
6	Lasbela	1.9	1.5	0.1	3.5	4.0	3.0	0.0	2.3	5.0
7	Nokundi	0.2	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
8	Ormara	0.9	0.4	0.3	1.6	0.0	0.0	0.0	0.0	0.0
9	Pasni	0.5	0.2	0.2	0.9	0.0	1.0	0.0	0.3	0.0
10	Punjar	1.7	0.5	0.4	2.6	0.0	2.0	7.0	3.0	2.0
11	Quetta	1.9	1.5	0.4	3.8	0.0	2.0	0.0	0.7	0.0
12	Sibbi	1.9	1.7	0.6	4.2	4.0	4.0	0.0	2.7	9.0
13	Zhob	5.1	3.7	1.2	10.0	1.0	3.0	0.0	1.3	14.0

Rainy Days of Khyber Pakhtunkhwa

S.No.	Station Name	Normal (1971-2000)				2013				2012
		July	August	September	July-Sep	July	August	September	July-Sep	July-Sep
1	Balakot	16.2	14.2	7.5	12.6	11.0	13.0	8.0	10.7	11.7
2	Cherat	6.3	7.4	3.3	5.7	3.0	9.0	0.0	4.0	4.7
3	Chitral	2.5	3.2	3.5	3.1	0.0	4.0	0.0	1.3	1.3
4	DI Khan	5.9	5.6	2.1	4.5	2.0	1.0	1.0	1.3	3.7
5	Dir	11.2	11.6	8.8	10.5	8.0	11.0	6.0	8.3	8.7
6	Drosh	5.4	4.7	4.8	5.0	2.0	5.0	2.0	3.0	2.7
7	Kakul	19.4	18.4	9.6	15.8	13.0	16.0	7.0	12.0	10.7
8	Parachinar	11.9	12.5	8.4	10.9	4.0	7.0	6.0	5.7	12.0
9	Peshawar	6.9	7.7	4.4	6.3	1.0	4.0	1.0	2.0	3.3
10	Saidu sharif	10.3	10.1	6.4	8.9	11.0	13.0	8.0	6.3	7.0
11	Kohat	9	9.4	5.7	8.0	3.0	9.0	0.0	3.0	3.3
12	Risalpur	9.9	11.6	5.7	9.1	0.0	4.0	0.0	6.0	4.3

Rainy Days of Azad Kashmir & Gilgit Baltistan

S.No.	Station Name	Normal (1971-2000)				2013				2012
		July	August	September	July-Sep	July	August	September	July-Sep	July-Sep
1	Astore	5.3	6.2	3.5	5.0	1.0	6.0	2.0	3.0	3.3
2	Bunji	5.1	5.4	3.3	4.6	0.0	5.0	1.0	2.0	2.0
3	Chilas	4.4	5.4	2.8	4.2	0.0	3.0	1.0	1.3	2.0
4	G-Dupatta	16.3	15.8	8.3	13.5	11.0	8.0	2.0	7.0	10.0
5	Gilgit	5.5	4.9	3.0	4.5	1.0	5.0	1.0	2.3	2.0
6	Gupis	2.1	2.1	1.4	1.9	0.0	6.0	0.0	2.0	3.3
7	Kotli	16.8	15.6	8.0	13.5	14.0	9.0	6.0	9.7	11.3
8	Muzaffarabad	17.8	15.7	8.8	14.1	14.0	10.0	7.0	10.3	10.3
9	Skardu	4.6	4.8	2.7	4.0	0.0	4.0	0.0	1.3	1.3

• **Temperature**

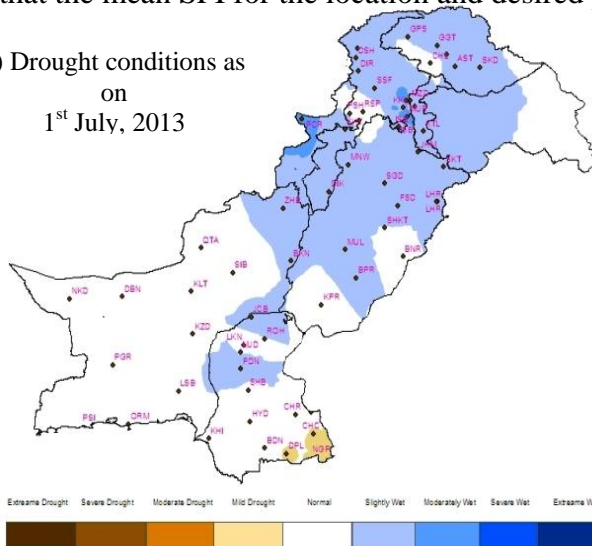
Both maximum and minimum temperature remained higher in May up to early June, 2013 than last two years. After 12th June, 2013 temperature tends to decreased due to pre-monsoon rains. Rainfall in 2nd and 3rd week, the humidity factor increased on different stations. Due to frequent rainfall maximum and minimum temperatures remained normal during August 2013. Maximum temperature remained 2-4 degree higher during first three weeks of September, 2013 as compared to last two years. The minimum temperature remained normal during first three weeks but in the last week, it was 2-4 degree higher than last two years.

4. Drought tools

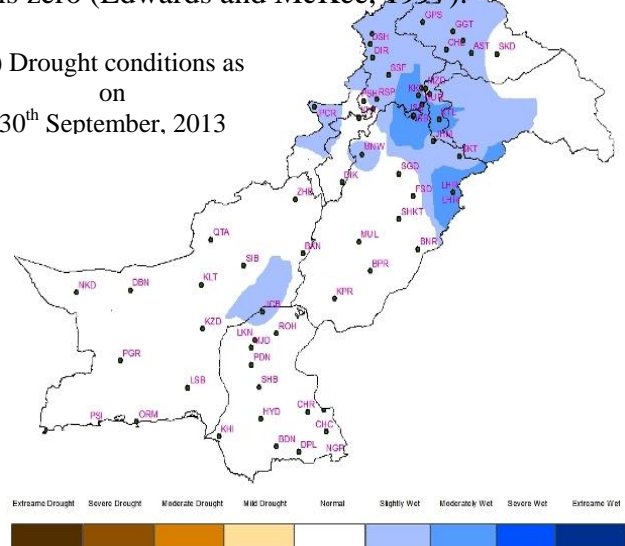
I. Standardized Precipitation Index (SPI)

The Standardized Precipitation Index (SPI) was developed for the purpose of defining and monitoring drought (McKee *et al.*, 1993). The SPI calculation for any location is based on a series of accumulated precipitation for a fixed time scale of interest (i.e. 1, 3, 6, 9, 12, months). Such a series is fitted to a probability distribution, which is then transformed into a normal distribution so that the mean SPI for the location and desired period is zero (Edwards and McKee, 1997).

a) Drought conditions as on 1st July, 2013



b) Drought conditions as on 30th September, 2013



Positive SPI values indicate greater than median precipitation, and negative values indicate less than median precipitation. Because the SPI is normalized, wetter and drier climates can be represented in the same way, and wet periods can also be monitored using the SPI. Here we are including 1month and seasonal maps to show the drought conditions for the monsoon season in the country.

II. Cumulative Precipitation Anomaly (CPA)

Due to intense monsoon precipitation, rainfall observed almost 11% above normal during monsoon season (July to September) as forecasted by PMD. Soil moisture conditions are good especially in the central and southern parts of the country. However a negative anomaly can be seen in the upper and southwestern parts of the country.

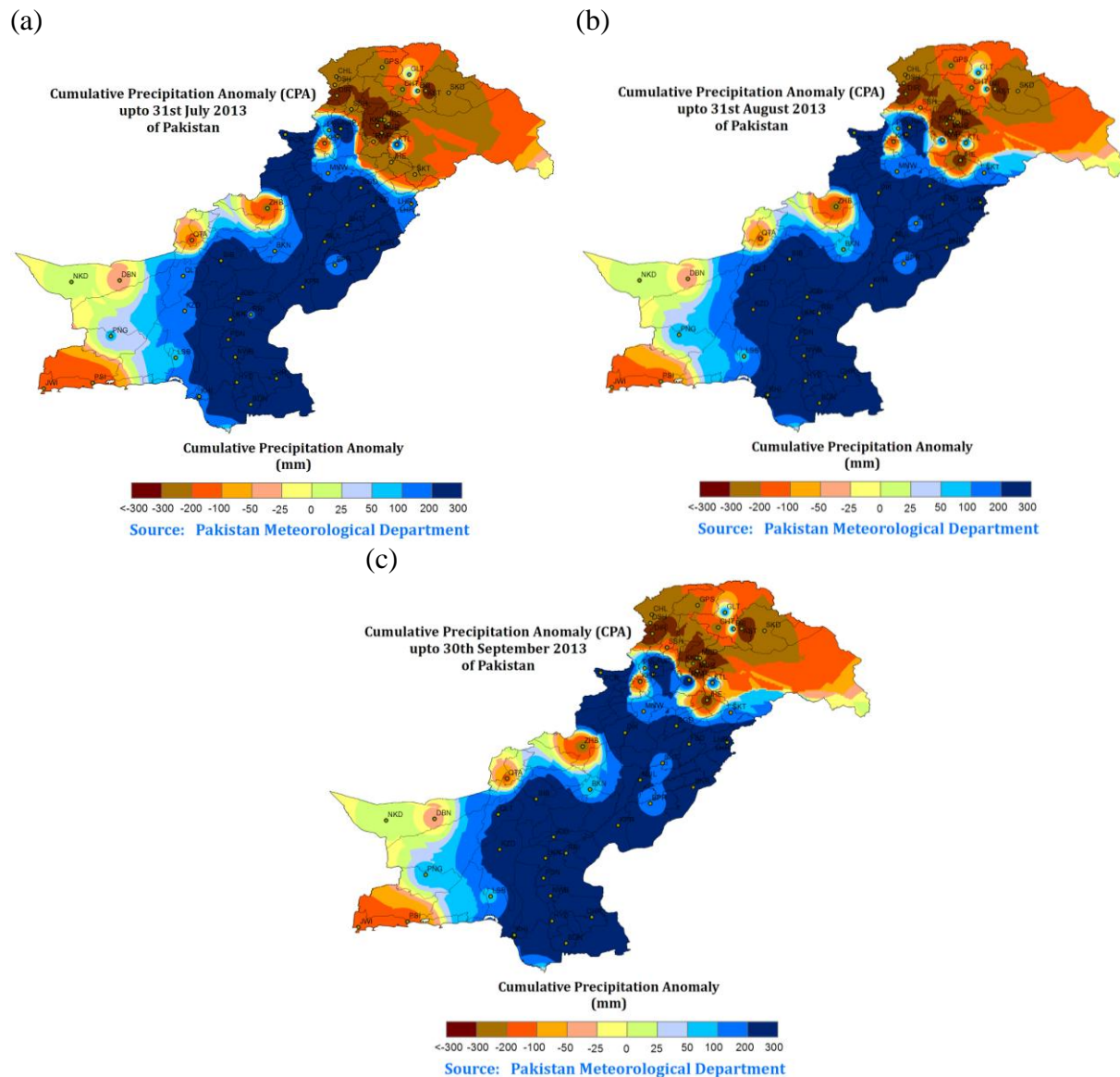


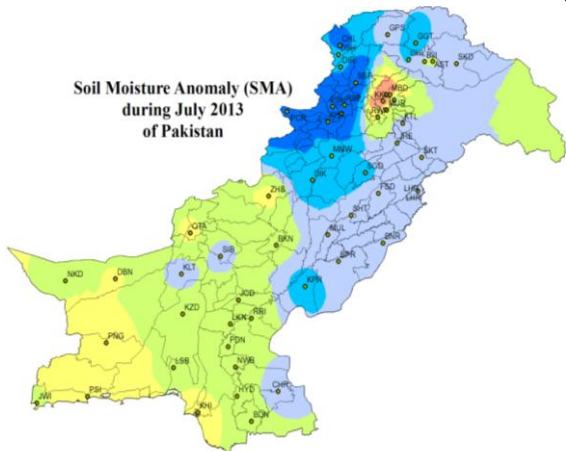
Figure-5 Cumulative precipitation anomaly during (July-September) 2013 of Pakistan

This positive anomaly in rainfall will be sufficient to provide enough moisture to the soil and fulfill the sowing of Rabi crops in these regions. Most parts of Eastern Sindh and southern Punjab districts (Ranjan Pur and D.G.Khan) are under flood water due to intense rainfall in the region.

III. Soil Moisture Anomaly (SMA)

Due to the normal rainfall (11%) during July-September, 2013 in the country, most of the moisture stress was observed in some districts of KP, Potwar region and southwest Balochistan as shown in figure-6. Soil moisture conditions in north eastern Punjab including Barani areas and central and north western parts of the country were normal.

(a)



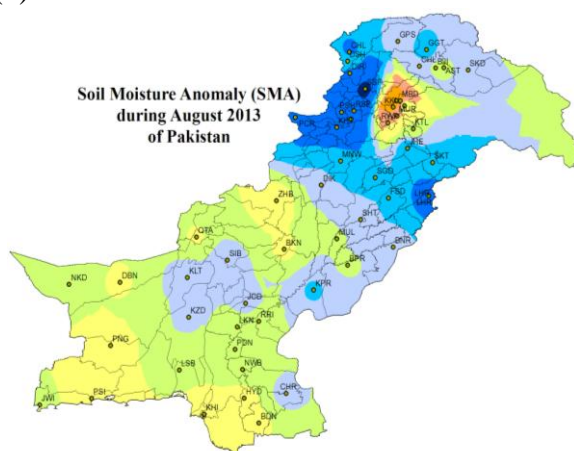
Soil Moisture Anomaly (SMA) during July 2013 of Pakistan

Soil Moisture Anomaly (mm)

<math><-300</math> -300 -200 -100 -50 -25 0 25 50 100 200 300

Source: Pakistan Meteorological Department

(b)



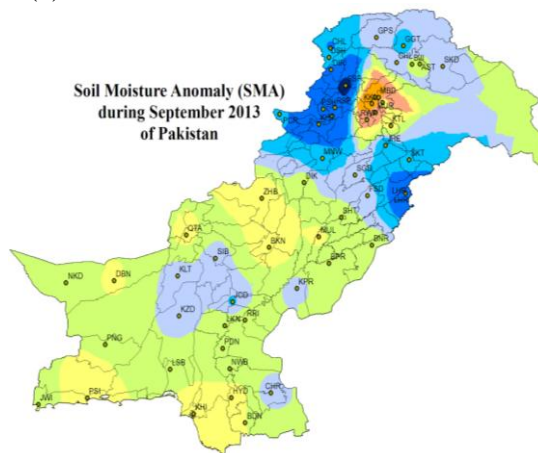
Soil Moisture Anomaly (SMA) during August 2013 of Pakistan

Soil Moisture Anomaly (mm)

<math><-300</math> -300 -200 -100 -50 -25 0 25 50 100 200 300

Source: Pakistan Meteorological Department

(c)



Soil Moisture Anomaly (SMA) during September 2013 of Pakistan

Soil Moisture Anomaly (mm)

<math><-300</math> -300 -200 -100 -50 -25 0 25 50 100 200 300

Source: Pakistan Meteorological Department

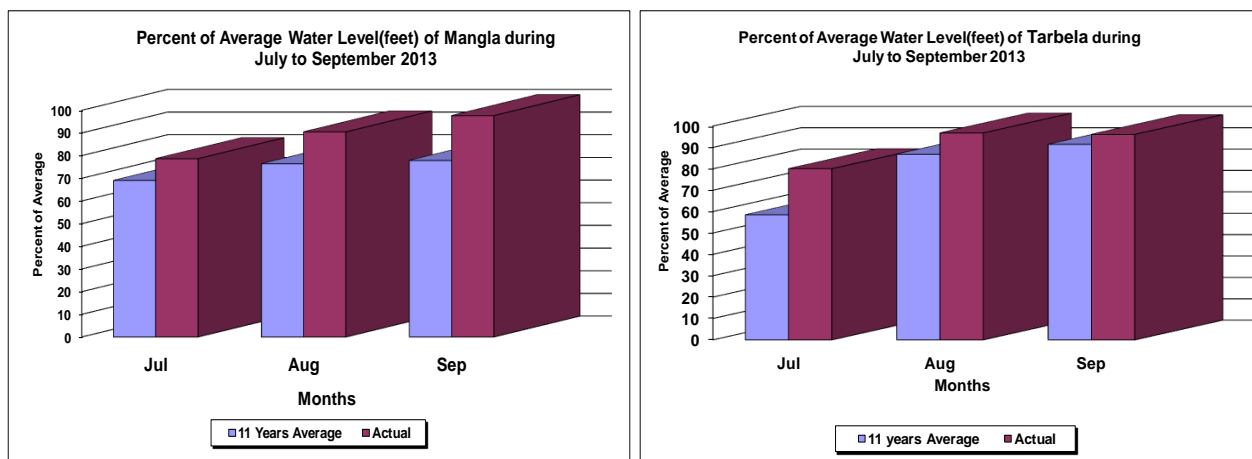
Figure-6 soil moisture anomaly during (July-September) 2013 of Pakistan

It was predicted that rainfall will be normal (10%) during July-September 2013 due to which soil moisture stress may be lessen especially in the rainfed and agricultural plains of the country. However the below normal rainfall during September caused a slight moisture stress in the country as shown in figure-6.

IV. Water Level of Reservoirs

Pakistan has two main reservoirs of water in the form of dam i.e. Tarbela and Mangla. The dead level of Tarbela is 1378feet while maximum conservation level is 1550feet while Mangla has dead level of 1040feet and maximum conservation level of 1242 feet. Due to good monsoon rains, reservoirs were filled to their capacity. Water situation in reservoirs is comparatively better than last year the end of July, the water levels in Tarbela and Mangla dams were 1531 and 1209.40 feet amsl, respectively. The sources of water storage in dams are rainfall and snow/glaciers melting from May to September. The water stored during this period is a major factor of irrigation water supply in the next Rabi 2013-14. Water accumulation in Tarbela and Mangla dams reservoirs started in early June 2013. Total water accumulated in both reservoirs is at 8.521MAF

In addition, small dams in various parts of the country were also filled to their capacity that would help boost agriculture and improve socio-economic activities in the country. Percentage of average water level during monsoon 2013 was calculated for both dams are shown below.



V. Water Discharge

AVERAGE WATER DISCHARGE AT KABUL DURING KHARIF		
S.No	Years	Water discharge (MAF)
1	Last 20	17.22
2	Last 10	14.77
3	Last 5	17.94

AVERAGE WATER DISCHARGE AT TERBELA DURING KHARIF		
S.No	Years	Water discharge (MAF)
1	Last 20	51.78
2	Last 10	48.28
3	Last 5	50.27
4	Average	50.53

This discharge indicates that this flow is gradually decreasing

AVERAGE WATER DISCHARGE AT MANGLA DURING KHARIF		
S.No	Years	Water discharge (MAF)
1	Last 20	17.01
2	Last 10	13.78
3	Last 5	15.51
4	Average	17.28

This discharge indicates that this flow is gradually decreasing

5. Agriculture

Agriculture is main livelihood of about 70% population of the country. Due to direct relationship between agriculture and water scarcity/drought, drought mapping data is of vital importance. Efforts are being made to inform farmers of drought information in a timely fashion for better utilization of data.

5.1 Crop Condition: July-2013

The perceptible features of Kharif season 2013 include (a) a cold regime extending into early Kharif season (b) slow down in glacier melts, reducing surface water supplies in the Indus River basin (c) delayed harvest of wheat crop affecting sowing of cotton and other crops and (d) nearly drought like situation of monsoon season up to end July.

The perceptible features of Kharif season 2013 mainly include (a) Strong heat wave extending into early season of cotton crop (b) Good pre-monsoon and monsoon rainfall in Punjab with few in Sindh and Balochistan provinces (c) Water shortage may have marginally reduced sown area in major cotton growing districts of Sindh (d) Sugarcane 2013-14 has better prospects in term of area and growing conditions in both Punjab and Sindh and (e) Rice transplantation in Punjab is almost complete while in Sindh some areas are affected by water shortage and are to be planted.

Economic Survey of Pakistan for year 2012-13 has been released by Ministry of Finance (MoF). The Agriculture sector is set to account for over 21.4 percent of GDP. The four major crops wheat (2.2%), maize (0.5%), rice (0.6%), cotton (1.5%) and sugarcane (0.7%) account for 5.4 percent on average to GDP. Among them, the three major crops cotton, rice and sugarcane are Kharif crops.

- **Cotton Crop**

Cotton in Pakistan is mainly concentrated in central & southern Punjab along left bank of Indus river in Sindh. The areas in Sindh include southern parts of Mirpur Khas, Sanghar, Umerkot, Khairpur, Sukkur and Shaheed Benazirabad. The early sown cotton crop cultivated during March/April was affected by high temperature during May and was mostly re-sown in Punjab.

This early sown cotton represent less than 5% of total Punjab production. The crop which received enough irrigation through canals/tube wells has reached flowering /boll opening stage. Normally, early sown cotton crop farmers practice cotton-fallow-cotton crop rotation and are considered progressive in farming community. This early sown cotton crop is mostly confined to Sahiwal division. Rest of southern Punjab farmers follow normal cotton cultivation during May-June after the harvesting of wheat. Cotton in southern parts is mostly affected by shortage of the irrigation water coupled with less rains and non availability of the underground water in Sindh. Stressed cotton with poor germinated fields have been observed in the districts of Sanghar, Umerkot and Mirpur Khas. Multiple picking of few maunds are very common practice of farmers in southern Sindh to increase the profits. Cotton can be picked for 10-16 times during entire season. Cotton in Shaheed Benazirabad, Sukkur, Ghotki and Khairpur is normal and picking is expected to start by end July or early August. A decrease in the cotton area has been reported against the targeted crop area in Sindh.

According to many cotton growers interviewed during survey, the main reason for decrease in the cotton cultivated area is shortage of irrigation water. Water shortage at the sowing time is also said to have resulted in lower plantation of the cotton crop. Insect pest attacks (thrips, whitefly for CLCV, bollworms and mealy bug) insect pest attacks have been reported by the local authorities in some areas of southern Sindh and Punjab. Appropriate measures have been taken to keep the crop damage within the economic threshold.

In major cotton growing districts of Punjab and Sindh, the monsoon rains have shown a significant difference in terms of impact on crop water requirement to sink the extreme temperature during day time and dissipate energy at night. However, there have been no frequent rains in the cotton growing belt of Southern Punjab and Sindh districts; therefore cotton crop was safe from the rain-

related pest / virus attacks. Only districts of Bahawalnagar, Jhang, Rahim Yar Khan, Multan and Mianwali have received above average rainfall. High humidity pockets may have required special measures for cotton pests control in the months of July and August

The early sown cotton crop (cultivated in March) is at picking stage in Sahiwal division of Punjab. The early cotton crop is mainly affected by heat wave (May) and insect pests. In rest of southern Punjab, farmers follow normal cotton cultivation during May-June. In southern Sindh, cotton is affected by the shortage of irrigation water coupled with less rains and brackish underground water. In some areas of southern Sindh & Punjab minor pest attacks of thrips, whitefly, bollworms and mealy bug have been reported by the local authorities.

- **Sugarcane Crop**

Sugarcane crop is performing relatively better, mainly because of more rainfall and less pest attacks in Punjab. However, in Sindh shortage of water was reported which may affect production slightly. The sugar mills are expected to start milling in November.

Sugarcane is a very important cash crop of Pakistan. It is mainly cultivated in central & southern Punjab and along left bank of Indus River in Sindh. The districts are Hyderabad, Matiri, Nausheroferoze, Tando Muhammad Khan, Tando Allah Yar, Sukkur, Khairpur and Naushahro Feroze. The major sugarcane growing districts of Punjab are Jhang, Faisalabad, Sargodha, Layyah, Toba Tek Singh, Chiniot, Mandi Bahauddin, Kasur, and Rahim Yar Khan. In Sindh, the sugarcane crop is mostly sown during September and the length of the growing cycle is around 12-14 months. Where as in Punjab, it is sown during February and the growing cycle is shorter by two months to that of Sindh. Furthermore, in Sindh the most distinctive phenomenon is the flowering in sugarcane which is not common in Punjab. Some parts of central Punjab, especially in Sargodha and surrounding districts, it is reported that crop is infested by red rot disease causing economic losses to the cane farmers.

Overall the crop is performing better due to sufficient rainfall and reduced pest attacks during the season in Punjab. These timely rains would be beneficial for increase in sugarcane production. However in Sindh, shortage of water reported may have a slightly detrimental effect on the production. There have been no frequent rains in the sugarcane growing belt of Central & Southern Punjab, Sindh and KP districts. Only districts of Mandi Bahauddin, Mianwali and Sargodha have received enough rainfall favorable for its growth. Most of the districts in Sindh have received less monsoon rains during July and the resulting decrease in canal irrigation will affect the final yield.

- **Rice Crop**

The transplantation of rice will be completed by mid-August depending upon supply of irrigation water. Due to availability of adequate water and early pre-monsoon rains, transplanting from nursery has almost been completed in the major basmati tract of Punjab. Sindh province is facing shortage of water to complete the rice transplantation in time. Almost 75% coarse rice has already been transplanted in major tract of Sindh and Balochistan. Remaining 25% will be completed by mid of August depending upon availability of irrigation water.

Third important kharif crop is rice which cultivates in all four provinces of Pakistan. The best Basmati rice is limited to the North Eastern parts of Punjab. The Coarse varieties of rice are sown at different acreage levels in Punjab, right bank districts of Sindh (Badin and Thatta). In Balochistan the major Coarse rice areas are Nasirabad and Jaffarabad. Coarse rice is also grown in different parts of KP, mainly Swat, Mansehra, Upper & Lower Dir and D.I.Khan. It is a water loving crop with shorter growing cycle. Due to availability of adequate water and early pre-monsoon, planting from nursery has been almost completed in the major basmati tract districts of Gujranwala, Hafizabad, Sheikhpura, Nankana Sahib, Sialkot, Narowal, Mandi Bahauddin and Gujarat. These districts produce best varieties of rice including Basmati 370, Super Basmati, Super Kernal, Basmati 386, Basmati 385 and Basmati 198. In rest of the Punjab, the sowing of coarse rice is completed by end of July.

Sindh province is facing shortage of water to complete the rice cultivation in time. Almost 75% coarse rice has already been transplanted in major tract of Sindh and Balochistan. Remaining 25% will be completed by mid August depending on availability of irrigation water. However, there have been frequent good rains in the basmati tract of Punjab. Whereas, coarse rice growing districts of Punjab and Sindh have received less than average rainfall and any deficit in canal irrigation will affect the final yield. Only districts of Mandi Bahauddin, Gujranwala, Sialkot, Gujrat, Lahore and Mianwali have received sufficient rainfall suitable for growth.

5.2 Crop Situation: August, 2013

During month of August, sugarcane, cotton and coarse rice in most parts of the country reached its peak growth stage. This year peak season vegetation indices are representing possible high crop productivity. The month of August is very crucial for cotton crop as picking season kicks off in most of Sindh and in few areas of Punjab. Heavy rainfall, floods, mealy bug and Cotton Curl

Leaf Curl Virus (CCLV) attacks in Punjab seem to have marginal effects on yield per acre. In Sindh, cotton crop looks promising although sporadic issues of insect pest attack have been reported.

The perceptible features of August-2013 of Kharif season mainly were the same as July 2013 however some inception river floods in Indus, Chenab and Sutlej mainly affecting Katcho area of Punjab & Sindh along with the flash floods in Nullah Deakh and Aik in basmati rice growing tract of Punjab.

The major Kharif crops include cotton, rice, sugarcane, maize, pulses, oilseeds, vegetables, fodders and others. The Kharif season started with a slowdown of surface water supplies and delayed harvest of wheat crop. This affected sowing of cotton, rice and other Kharif crops with stretched up sowing period. The shortfall in rainfall during July further exacerbated the growth of crops. In overall the rains are highly useful for sowing of Rabi crops as vegetables, oilseeds and other crops as this operation has already set in from mid-September onwards and there is sufficient soil moisture to pay off for sowing obligation of crops. The residual moisture from rains will also be especially useful for sowing of wheat and other Rabi crops, above all, in rain fed areas. Farmers have already started planking and other operation to conserve soil moisture. Given a good start for sowing of wheat and other Rabi crops, the prospects of national food security are seemingly bright.

- **Cotton Crop**

The month of August is very crucial for cotton crop as picking season starts to kick off in most of Sindh and in some parts of Punjab. Heavy rainfall, flooding, mealy bug and Cotton Curl Leaf Virus (CCLV) attacks in Punjab have marginally affected the yield per acre. The impacts of torrential rains on acreage have been observed in Southern parts of Punjab especially in Rajanpur, D.G Khan and Muzaffargarh. In Sindh, most of cotton is promising although sporadic issues of insect pest have been reported. However, the flowering of cotton plants in September when rains subside would bring some improvement and exact determination of the crop size would then be possible.

There have been medium amount of rains in the cotton growing districts of Punjab and Sindh. Okara, Sahiwal, Mianwali, Faisalabad and Dera Gazi Khan Districts have received above average rains in August. Rest of other districts received positive cotton productive rainfall i.e. Bahawalpur, Bahawalnagar, Sanghar etc.

- **Sugarcane Crop**

Sugarcane is a very important cash crop of Pakistan. It is mainly cultivated in central & southern Punjab and along left bank of Indus River in Sindh. In Sindh, the sugarcane crop is mostly sown during September and the length of the growing cycle is around 12-14 months. Whereas in Punjab, it is sown during February and the growing cycle is shorter by two months to that of Sindh. Some parts of central Punjab, especially in Sargodha and surrounding districts, it is reported that crop is infested by red rot disease causing economic losses to the cane farmers. Sugar cane crop benefitted from the rains during monsoon 2013. Sugarcane grown closer or inside the active river flood plains of Indus basin may have minor impacts on acreage as well as crops sugar productivity. Overall prospects of sugarcane are promising. There have been frequent rains in the sugarcane growing belt of Central & Southern Punjab, Sindh and KP districts. Districts of Faisalabad, Bahawalpur, Bahawalnagar, Mandi Bahauddin, Mianwali and Sargodha have received enough rainfall favorable for its growth. Most of the districts in Sindh have received less monsoon rains during August and the resulting decrease of 25% in canal irrigation will affect the yield.

- **Rice Crop**

Rice is cultivated in all the four provinces of Pakistan. The best Basmati rice is limited to the North Eastern parts of Punjab. The Coarse varieties of rice are sown at different acreage levels in Punjab, right bank districts of Sindh (Badin and Thatta). In Balochistan the major Coarse rice areas are Nasirabad and Jaffarabad. Coarse rice is also grown in different parts of KP, mainly Swat, Mansehra, Upper & Lower Dir and D.I.Khan.

The sowing of IRRI rice was timely completed by end of July in most of the areas of the country. However, in basmati rice zone of central Punjab i.e., Gujranwala, Hafizabad, Sheikhpura, Nankana Sahib, Sialkot, Narowal, Mandi Baha uddin and Gujarat districts, late sowing is still in progress. Transplantation in ponded flood water has been observed in some parts of zone. Rice crop is affected by Nullah Degh and Aik either by plants uprooting or silt forced lodging.

There have been heavy rains in the basmati growing region in Punjab and lesser rains in Sindh, Balochistan and KP districts. Districts of Sialkot, Gujranwala and Lahore have received well above average cumulative rainfall of August, ranging from 300–600mm. Most of the districts in Sindh, Balochistan and KP have received less rainfall

5.3 Crop Situation: September, 2013

Major Kharif crops including cotton, rice and sugarcane are progressing with no serious threat of floods, insects, pests /diseases attack beyond the economic threshold during the month of September, 2013. The weather has generally remained dry during September in the cotton growing areas and the crop escaped the high humid weather responsible for widespread pests and disease attacks. The cotton crop sown in February– March is at picking stage while that sown in May is at boll opening and picking stage.

The Sugarcane crop is at maturity stage of growth. Harvesting of early maturing varieties may start during November that of mid-season during December while that of late maturing varieties during January. Sugarcane crop benefited from rains during monsoon and is under sucrose translocation and accumulation in stalk. The rice crop is actively growing and is at different growth stages depending on the type (IRRI and basmati) and locality. Uprooting of standing crop by flood and late transplanting of basmati crop in Central and North-East Punjab during August were responsible factors affecting crop productivity.

Spells of heavy rains affected various parts of the country during July- August 2013 resulting in riverine/ flash flood in local nullahs flooding in north-eastern Punjab, hill torrents in South-western Punjab & Balochistan and riverine flood in Indus, Chenab, Ravi and Sutlej rivers. Floods largely remained within the embankments causing damage to crops and infrastructure within the flood plains.

Kharif Crops

- **Cotton Crop**

In Pakistan, the cotton area has shown variability over years depending upon (a) fluctuations in price of seed cotton (b) intensity of pests and diseases especially cotton leaf curl virus and (c) situation of floods and rains. The weather has generally remained dry in September and the crop escaped the humid and hot seasons responsible for wide spread of pests and disease attacks. Overall the crop is generally in marginal condition.

- **Sugarcane Crop**

The sugarcane area has shown variability over years depending upon (a) fluctuations in prices of cane (b) irrigation water availability and (c) situation of floods and rains. The current rains have generally benefited the crop. The sugarcane crop is at maturity and sucrose accumulation is at boom. Harvesting of sugarcane crop starts during November. The planting season adjusted at autumn starts from the first week of September and continues till mid-October in Punjab and

Sindh, while in Khyber Pakhtunkhwa planting is carried out in October and November. Spring planting starts from mid-February and lasts until the end of March in Punjab and Sindh.

- **Rice Crop**

The rice crop is actively growing in in month of September across Pakistan. The crop is at different vegetative growth stages depending on the type (IRRI and basmati). Decrease in expected production to some extent may be attributed to uprooting of standing crop and late transplanting of basmati crop in Gujranwala, Hafizabad, Sheikhpura, Nankana Sahib, Jahng, Chiniot, Sialkot, Narowal, MandiBahauddin and Gujrat districts due to floods.

6. Rains/Flood 2013: Rapid Crop Damage Assessment

Spells of heavy rains hit various parts of the country during July-August 2013 and caused riverine floods in river Indus, Sutlej, Chenab and Ravi. Hill torrents inundation affected different regions in South-western Punjab, Sindh, KPK and Balochistan. Basmati rice growing area of northeastern Punjab was affected by overflow of ephemeral streams of Nullah aik and degh. The riverine inundations largely remained within the embankments causing damages to crops and infrastructure within the floodplains. Crops showed varying degree of damages as flood and rains runoff varies with flood extent & intensity, geo-location, crop types, crop size, crop growth stages and sometimes cropping practices in particular areas.

7. District wise impact of drought

Due to wetter than normal season, no negative impacts of drought have been reported from any part of the country. Early two months of monsoon season below normal rainfall observed which creates drought like conditions in tharparkar districts and southwest parts of Balochistan. But the rainfall during September proves to be helpful to reduce the drought conditions in tharparkar. Damages to crops, infrastructure and livestock have been reported in southern Punjab and Sindh province due to flash and urban flooding. It is predicted that

8. Government reactions to drought

All functionaries of the state machinery remained engaged in providing relief to flood affective of Sindh. Since there was no significant impact of drought during the quarter, no intervention was made at official level except in tharparkar but rainfall during last week of August and first week of September reduces the drought effects in the tharparkar district. However, NDMC continued its monitoring activities and drought monitor was regularly updated on fortnightly basis at PMD website <http://www.pmd.gov.pk/ndmc/index.htm>

9. Seasonal Advisory/Outlook

Below normal precipitation is expected in whole of the Sindh province and major parts of Punjab and Kashmir region. Balochistan except Sibbi, some parts of Khyber Pukhtunkhwa along with adjoining areas of Punjab and Gilgit-baltistan region are likely to experience normal precipitation during the month of October. However slightly above than normal (1971-2000) rainfall is expected in the southwestern parts of Khyber Pukhtunkhwa and Gilgit region

Above normal rainfall is predicted in Khyber Pukhtunkhwa, Gilgit-Baltistan and Punjab province excluding its southern parts. Positive departure is more prominent in the northern parts of the Punjab and Chitral region. All the remaining parts of the country are expected to receive below normal rainfall for the period October to December 2013. Maximum negative percentage departure is observed in south western parts of the country as well as in Skardu. However normal rainfall is expected in southern plains of the Punjab.

Pakistan Meteorological department closely watching the weather condition and update its advisories, monthly and seasonal outlook whenever required. It is therefore advised to keep yourself update by log on to www.pmd.gov.pk or <http://www.pmd.gov.pk/ndmc/index.htm>

10.Recommendations

Natural disaster could not be stopped. Each disaster gives us a lesson to do better planning, management and taking some precautionary measures to minimize its impacts in future. Following are some recommendations to cope with the floods and droughts in Pakistan

- Pakistan dam's water storage capacity is much less than the neighboring countries like India. Therefore it is the need of the hour to built large and small dames in catchments areas especially the rainfall water during monsoon period.
- Manage the floods and storage the water
- The stored water will protect food security especially fulfill the water requirements of crops during drought period in the country.
- The water will also be helpful in generating hydropower electricity which is essential requirement of country and reduce the unemployment in the country.

11.Acknowledgement

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