Pakistan Meteorological Department


Snowfall over Margallas

2016

Climate of Pakistan (2016)

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Climate of Pakistan in 2015

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Climate of Pakistan in 2016

1. Introduction

Temperature and precipitation are two major elements which determine the climate of any region. Any persistent change in both or one with respect to the long term mean or normal values leads to the climate change of that region. Highlights of the analysis for the climate of Pakistan in 2016 are listed below.

2. Temperature

Average Monthly Temperatures of Pakistan for the year 2016 are compared with Average Monthly Normal Temperatures (1981-2010) in figure 1.

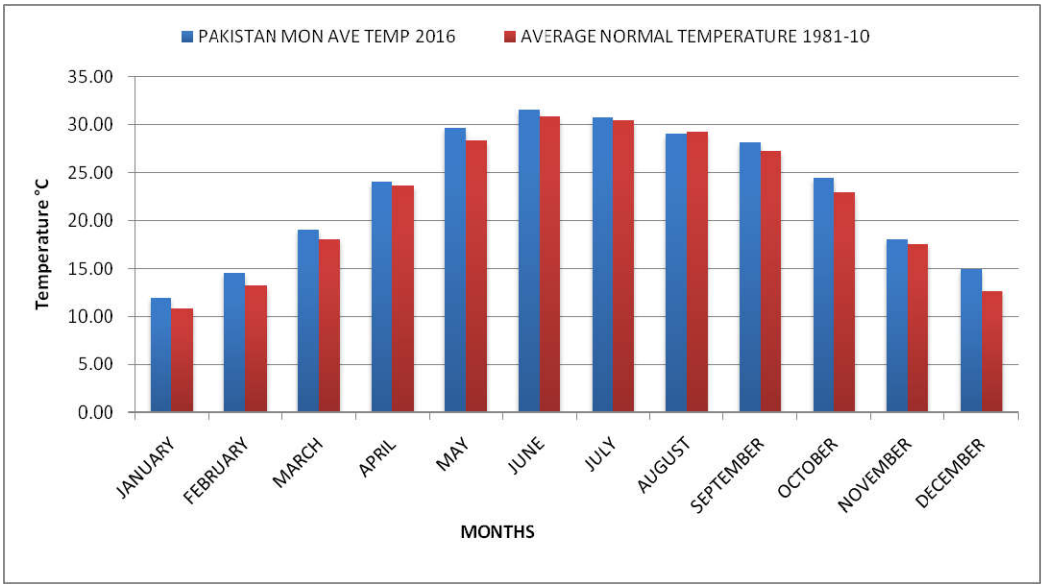

Figure 1: Departures of 2016 mean monthly temperatures from Normal (1981-2010)

Monthly mean temperatures of 2016 were above the 1981-2010's average normal temperatures in January, February, March, May, October and December. April, July, August and November temperatures were equal to normal while June and September were near to Normal (Fig. 1).

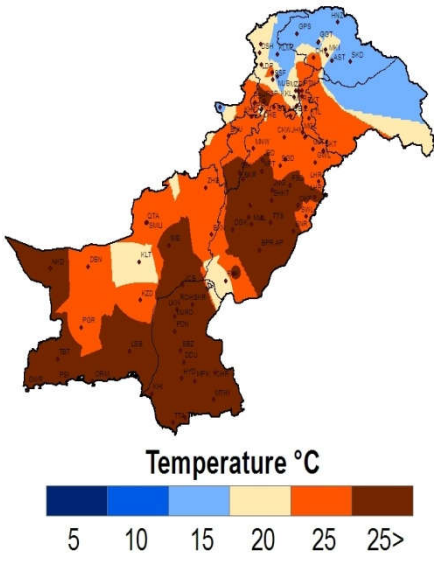

Figure 2: Spatial Distribution of Mean Annual Temperatures of Pakistan for 2016

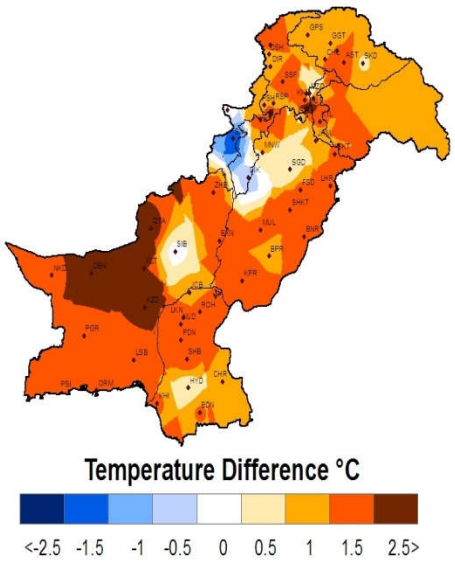

Figure 3: Mean Annual Temperatures (2016) Difference from Normal

Annual Mean Temperatures (actual) for 2016 remained on higher side in most of the country (Fig. 2). Whole Sindh remained above 25^0C, Punjab and major Portion of Baluchistan experienced temperatures ranging from 24^0C - 27^0C or even higher. Only a narrow belt of Northern areas had temperatures ranging from 6^0C - 10^0C. Figure 3 above shows mean annual temperature departures from Normal 19981 - 2010.

3. Rainfall

In 2016 most of Balochistan, Sind, Upper KP and eastern Northern areas had witnessed normal to below 1981-2010 Normal rainfalls. As shown in Figure 4, most of Punjab and lower KP were towards wetness whereas parts of Sind, western Northern areas and AJK regions were near normal. Upper parts of Sind and most of Balochistan experienced mild to moderate drought like conditions.

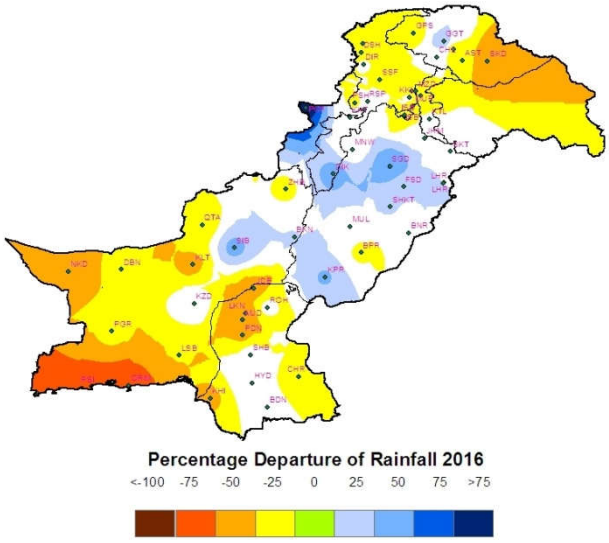

Figure 4: Percentage departure of 2016 Rainfall from Normal 1981-2010

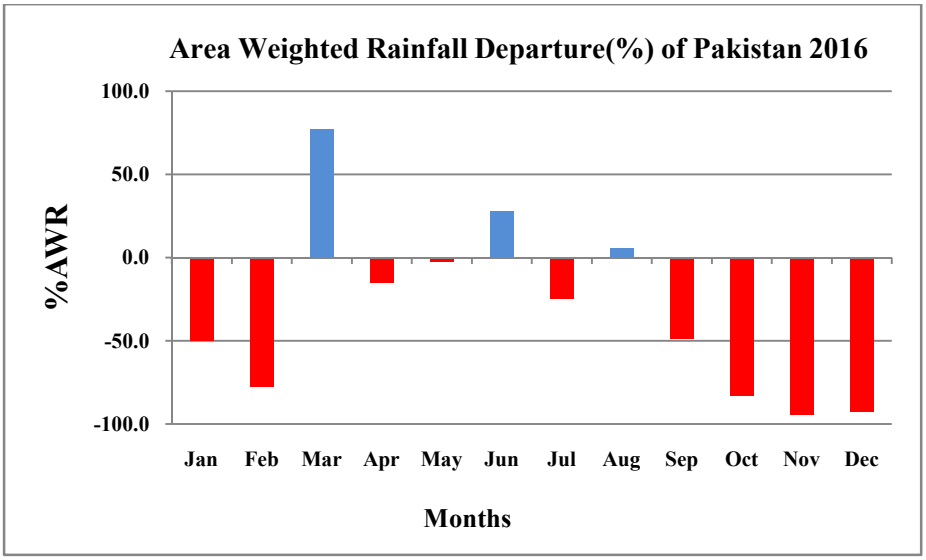

Figure 5: Percentage Departures from Normal of Rainfall 2016

In figure 5, percentage area weighted departure of monthly rainfall of 2016 from normal monthly rainfall of 1981-2010 has been shown. The analysis shows that 2016 was the dry year in Pakistan. January, February, April, July, and September to December seen below normal precipitation. Amongst these dry months February, October, November and December received 77% – 95% below normal rainfall. Whereas in the months of March and June rainfall was above normal. It was near normal in May and August. March with 77.4% above normal precipitation was the wettest and November with 94.6% below normal rains was the driest month of the year.

Major parts of Pakistan received heavy rainfall in the months of March in pre-monsoon spell and Jun and August in monsoon. During March, amount of rainfall was well above normal (77.4%) in the country. Next in June, amount of rainfall was well above normal in Sindh (155.3%). Afterwards, August 2016, seen normal (5.67%) rainfall in the country and above normal in Sindh (50.68%).

During September, 2016, amount of rainfall was well below normal in the country (-49.01%), the below normal rainfall was observed in Sindh (-82.76%) Punjab (-46.28%), Gilgit-Baltistan and Kashmir (-38.55%), KP (-34.96%) and Balochistan (-24.86). Also during last quarter of the year (Oct-Dec), well below normal (-89.73%) precipitation was observed over whole Pakistan.

Spatial distribution of total annual rain fall over Pakistan for 2016 depicts extreme rainfall over north Punjab, AJK and Eastern KP (the monsoon belt) which exceeded 1000mm (Fig.6). It is obvious from fig. 5 that it happened in the months of October and November. Lower half of Baluchistan received very little rainfall ranging from 50 to 100 mm which is leading most of the areas there towards meteorological drought conditions.

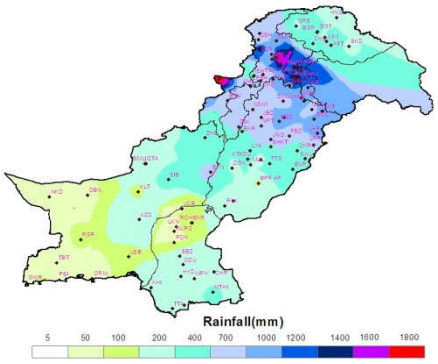

Figure 6: Spatial Distribution of Annual Total Annual Rainfall over Pakistan for 2016

4. Extreme Events

Highest Maximum and lowest Minimum Temperatures of Province-wise cities of Pakistan during 2016 are shown in Figure 7(a-e).

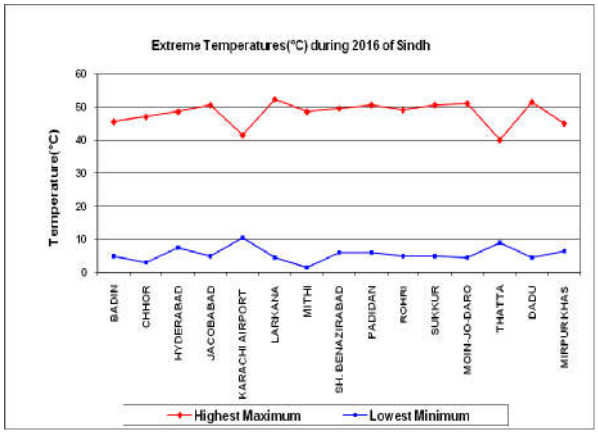

Figure 7 (a): Extreme Temperatures of Sindh

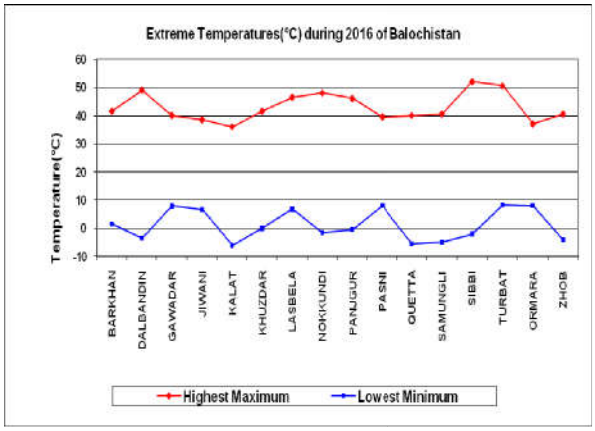

Figure 7(b): Extreme Temperatures of Balochistan

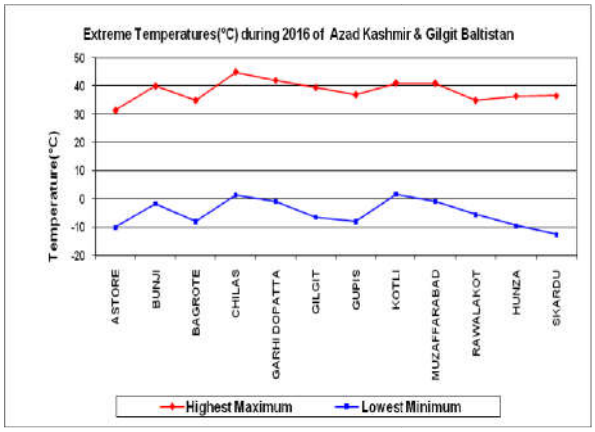

Figure 7 (c): Extreme Temperatures of AK & GB

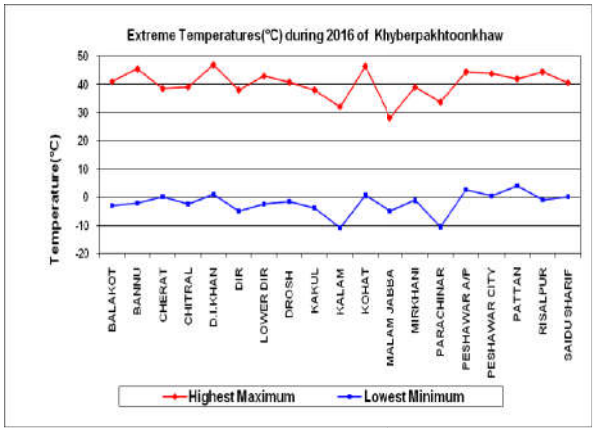

Figure 7 (d): Extreme Temperatures of KPK

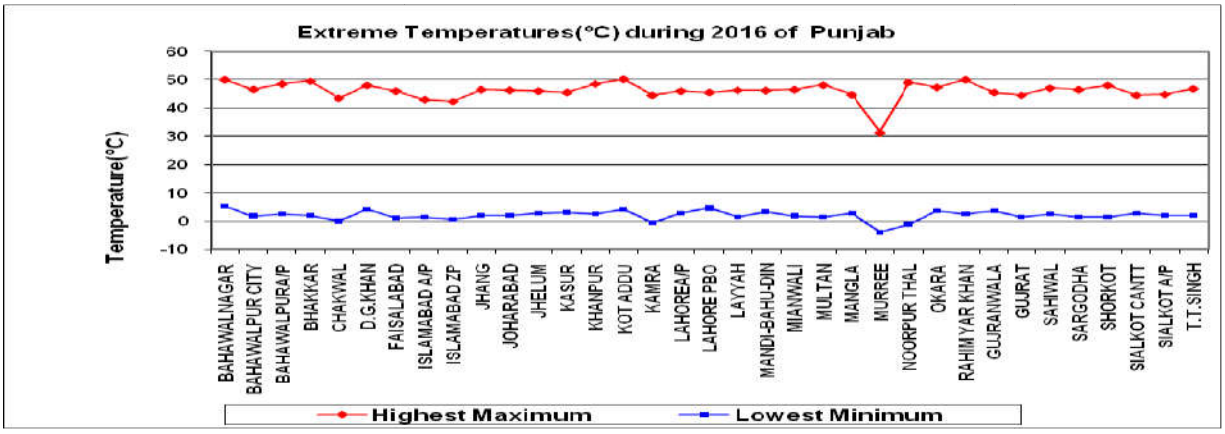

Figure 7 (e): Extreme Temperatures of Punjab

Highest daily Rainfall in 2016 for different cities of Pakistan Province-wise is given in Figure 8(a-e).

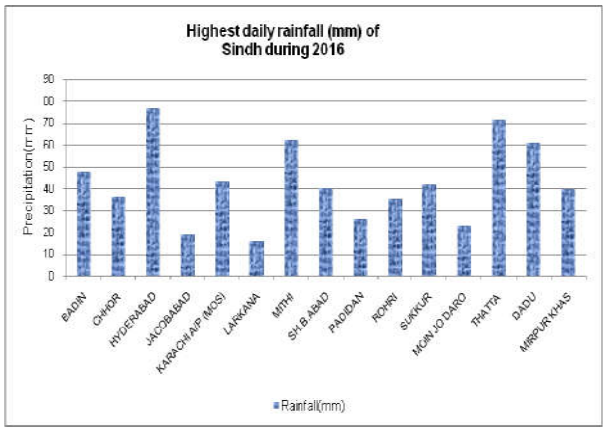

Figure 8 (a): Highest daily Rainfall of Sindh

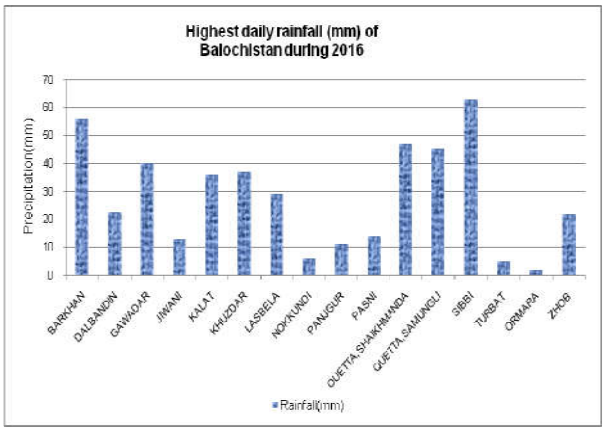

Figure 8 (b): Highest daily Rainfall of Balochistan

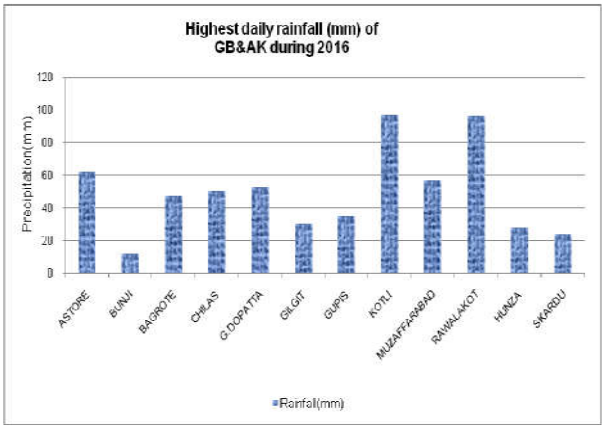

Figure 8 (c): Highest daily Rainfall of AK & GB

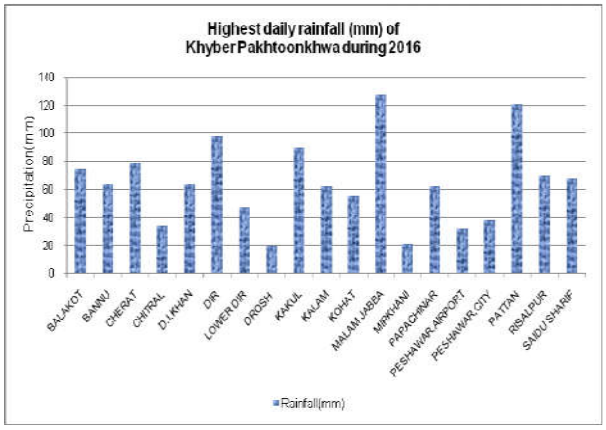

Figure 8 (d): Highest daily Rainfall of KPK

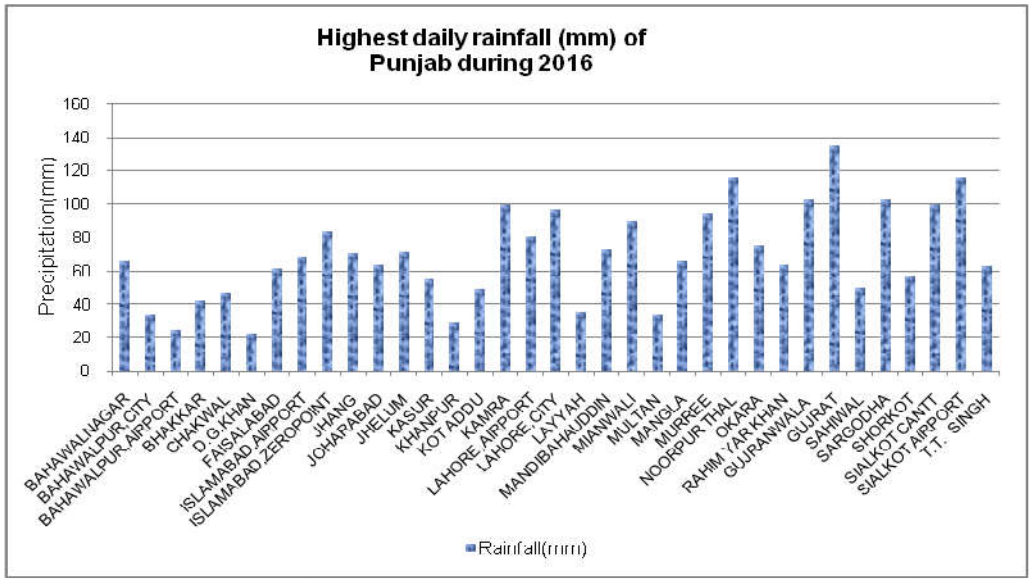

Figure 8 (e): Highest daily Rainfall of Punjab

5. Other extreme Events of 2016

(a) Heat Wave in Pakistan April and May , 2016

The definition of heat wave recommended by the World Meteorological Organization is when the daily temperature of more than five consecutive days exceeds the average maximum temperature by 5°C (9 F), the normal period being 1981-2010. An analysis of extreme temperatures during 1965-2009 shows that major parts of the country have been experiencing a warming trend. The frequency of extreme maximum temperature events are increasing significantly in Northern Areas, Southern Punjab, Sindh and Baluchistan.

Two heat waves struck the country one in April and other in May 2016. Most of the country was under the grip of heat wave during 25 to 30 April and17 to 24 May. In April a few cities from Punjab (Bahawalnagar, Jehlum, Lahore and Shorkot), Khyber Pakhtoonkhwa (Balakot) and Baluchistan (Khuzdar and Panjgur) reported the heat wave. Whereas in May some 31 cities suffered the heat wave. These cities include Punjab: Jehlum, Mianwali Murree, Okara and R. Y. Khan; Gilgit Baltistan and AJ&K: Chilas, Garhi Dopatta, Gupis, Muzzaffar Abad, Rawalakot and Skadu; Khyber Pakhtoonkhwa: Balakot, Chitral, D. I. Khan, Dir, Lower Dir, Drosh,Kakul, Kohat, Peshawar, Pattan, Risalpur and Saidu Sharif; Sindh: Jacobbd, Larkana, Sukkur and Moin-Jo-Daro and Baluchistan: Khuzdar, Quetta, Samungli and Sibbi.

Karachi suffered three very hot days (22-24 May) as forecasted by PMD. Although these hot days charged death toll there (as reported by some news agencies) yet these do not satisfy the definition of heat wave.

Figure 11: Glimpses of hot summer in Pakistan during 2016

(b) Flash Flood / Flood in 2016

This year heavy rainfall events started in late February. All season, from Pre-monsoon till post-monsoon remained very wet except May and August. These extreme rainfall events generated flooding almost all over Pakistan. The mini tornado hitting Peshawar on 26th April poured 60mm and caused flash flood there. Heavy rainfall starting on Jun 3 resulted in flash floods in Khuzdar District (Baluchistan).

Heavy monsoon rains, the rapid melting of snow and outbursts from glacial lakes from 16 to 22 July 2015 led to flash floods and the flooding of the Indus River in various locations affected all provinces of Pakistan. Chitral District in Khyber Pakhtunkhwa had been badly hit with an estimated 285,000 people affected.

Figure 12: Scenes of flash flood/flooding in Punjab and Sindh during 2016

(c) Snow Fall on Margallas-Islamabad, February 2016

The Margalla hills wore a magical white look on Thursday February 11, receiving an unusual snowfall.

Margalla Hills of Islamabad received 2-6 inches snowfall after 5 years.

Figure 13: Snow fall over Margalla hills on Thursday 11th February 2016

(d) Snow Fall in Mansehra, February 2016

After a quite long time Mansehra also witnessed the snow fall on Thursday February 11.

Mansehra city in Hazara division received 6 to 8 inch snowfall after 8 years.

Figure 14: Snow fall in Mansehra on Thursday 11th February 2016

(e) Torrential Rains in Baluchistan, March 2016

Major Baluchistan's districts including the capital Quetta received heavy rains coupled with hail storm on March 4, 2016.

These heavy rains led to flood situation and overflowed of drains in surrounding areas of Chaman and Zhob.

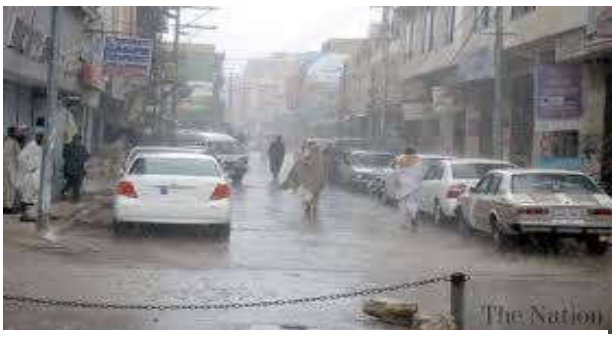

Figure 15: Torrential Rain fall in Quetta on Friday 4th March 2016

6. Drought Monitor

National Drought Monitoring Centre of PMD monitors drought events on fortnightly basis; according to which 2016 has seen normal to wet conditions in most parts of Punjab, KPK,GB & AJK and Sind. Whereas most of Baluchistan alongwith adjoiningsouth western parts of Sind had Mild to Moderate Drought. Yet Kalat division experienced severe drought conditions. Western parts of KP, FATA and south eastern Punjab received very good rainfall. Figure 14 below shows the drought conditions of whole Pakistan for 2016.

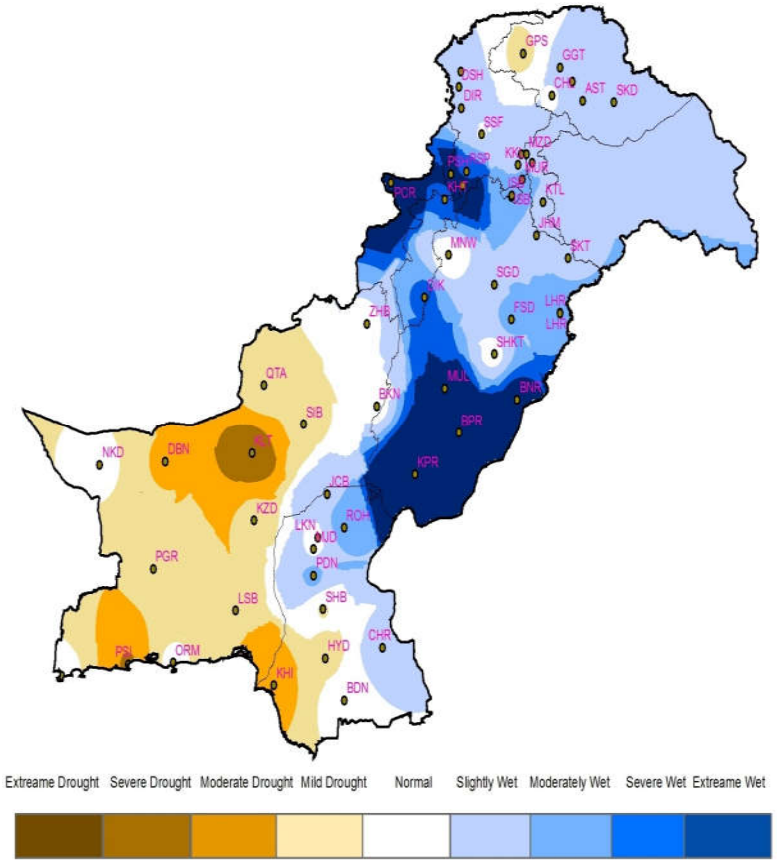

Figure 16: Drought analysis for Pakistan for the year 2016