

2014

Climate of Pakistan (2014)

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Climate of Pakistan in 2014

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Climate of Pakistan in 2014

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 2014 are listed below.

2. Temperature

Average Monthly Temperatures of Pakistan for the year 2014 are compared with Average Monthly Normal Temperatures (1981-2010) in figure 1.

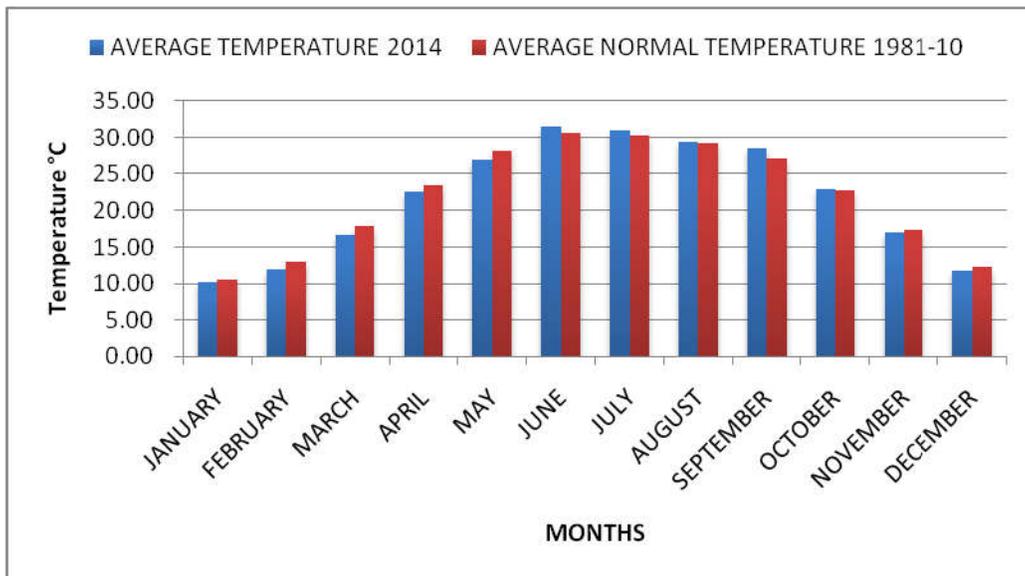


Figure 1: Departures of 2014 mean monthly temperatures from Normal (1981-2010)

Monthly mean temperatures of 2014 were above the 1981-2010's average normal temperatures in June, July and September. October and August temperatures were equal to normal while January and November were near to Normal. February, March, April, May and December had seen below 1981-2010's average normal temperatures (Fig. 1).

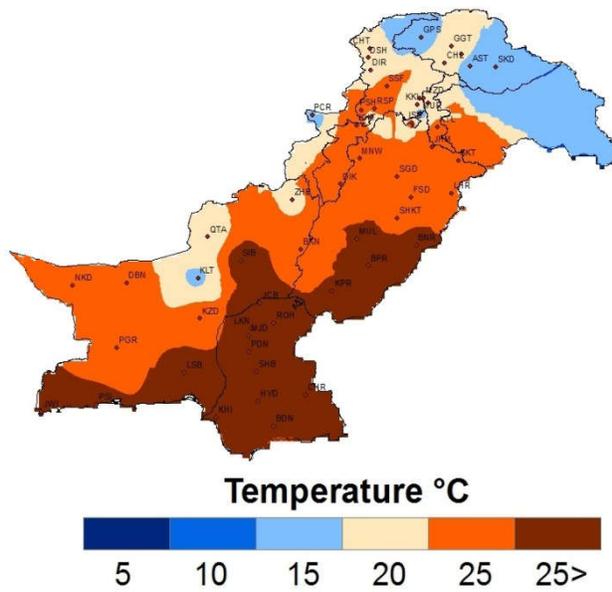


Figure 2: Spatial Distribution of Mean Annual Temperatures of Pakistan for 2014

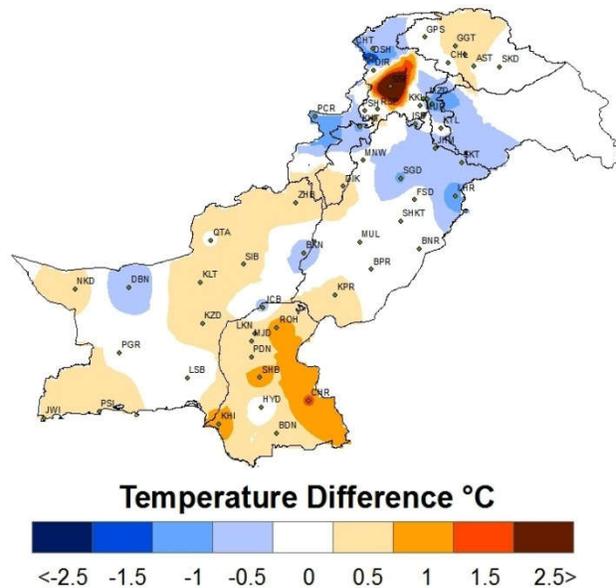


Figure 3: Mean Annual Temperatures (2014) Difference from Normal

Annual Mean Temperatures (actual) for 2014 remained on higher side in most of the country (Fig. 2). Whole Sindh, Punjab and major Portion of Baluchistan experienced temperatures ranging from 24°C - 27°C or even higher. Only a narrow belt of Northern areas had temperatures ranging from 6°C - 10°C . Figure 3 above shows mean annual temperature departures from Normal 1981-2010.

3. Rainfall

2014 has overall been a moderate year as shown in figure 4 below. As 2013 was a wet year most parts of the country sustained the moisture. Punjab and KPK & GB were towards wetness whereas Sind experienced mild to moderate drought. Most of the Baluchistan regions were near normal except its coastal regions.

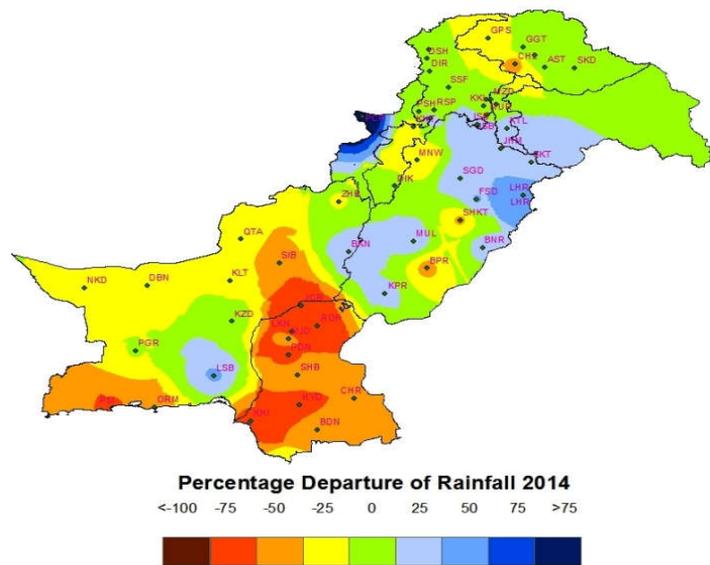


Figure 4: Percentage departure of 2014 Rainfall from Normal 1981-2010

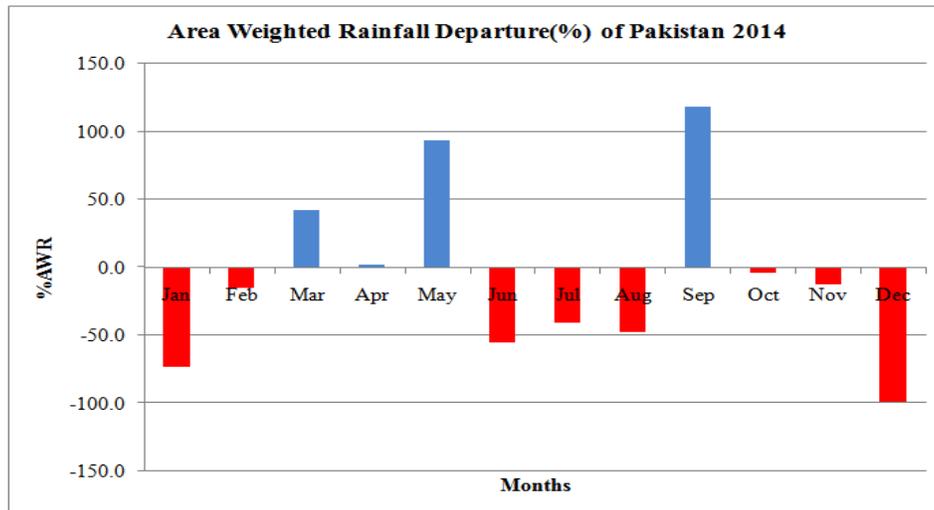


Figure 5: Percentage Departures from Normal of Rainfall 2014

In figure 5, percentage area weighted departure of monthly rainfall of 2014 from normal monthly rainfall of 1981-2010 has been shown. January, February, Jun, July, August and November seen below normal precipitation whereas in the months of March and May rainfall was above normal. It was near normal in April and October; and abnormally high above normal in September. December remained driest month of the year.

Major parts of Pakistan received heavy rainfall in the months of March to May, while during Jun to August rain was sparse. Heavy down pour in September and October fulfilled the requirement of moisture for sowing of Rabi crops. Sind and Baluchistan remained dry during septmber to November whereas dry spell engulfed the whole country in December.

September 2014 caused floods in the catchment areas of India's eastern rivers of Chenab, Ravi, Sutlej, and Jhelum, resulted in flash floods in Punjab, Gilgit Baltistan and Azad Jammu and Kashmir (AJ&K). This also caused a lot of damage to standing crops in southern parts of Pakistan especially the Sind region.

Spatial distribution of total annual rain fall over Pakistan for 2014 depicts extreme rainfall over north Punjab, AJK and Eastern KPK which exceeded 1000mm (Fig.6). It is obvious from fig. 5 that it happened in the months of May and September. Lower half of Baluchistan received very little rainfall ranging from 20 to 200 mm which is leading most of the areas there towards meteorological drought conditions.

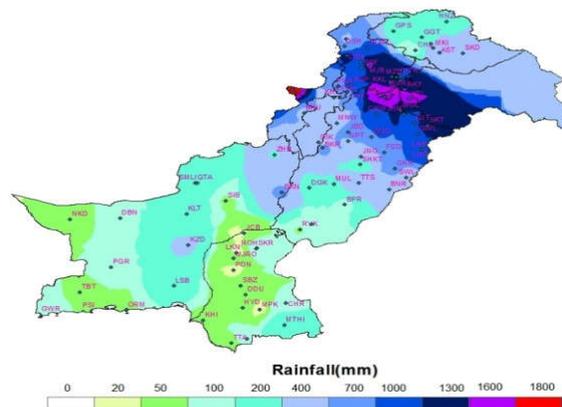


Figure 6: Spatial Distribution of Annual Total Annual Rainfall over Pakistan for 2014

4. Extreme Events

Highest Maximum and lowest Minimum Temperatures of Province-wise cities of Pakistan during 2014 are shown in Figure 7(a-e).

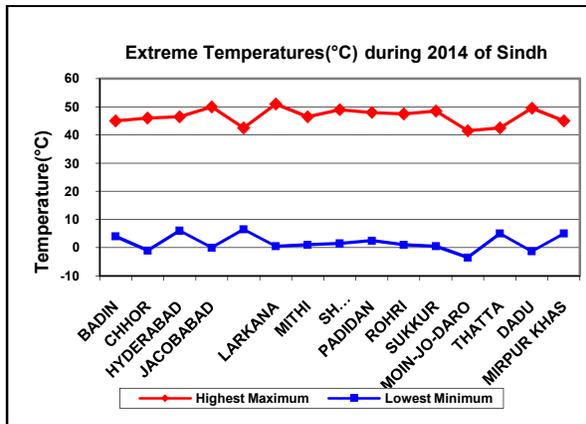


Figure 7 (a): Extreme Temperatures of Sindh

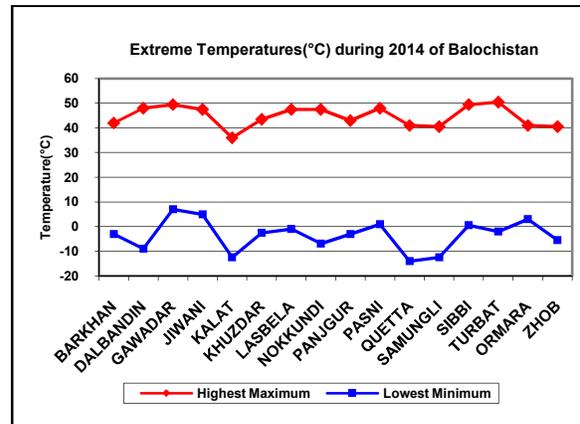


Figure 7(b): Extreme Temperatures of Balochistan

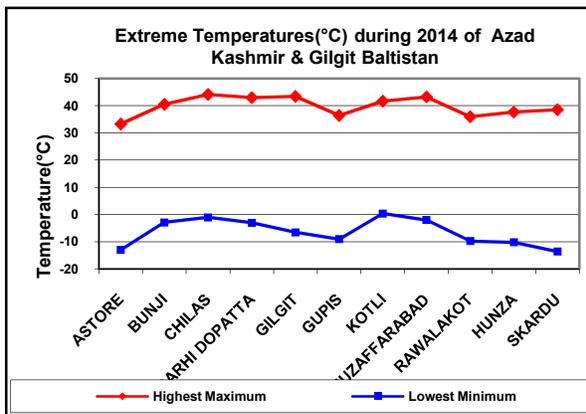


Figure 7 (c): Extreme Temperatures of AK & GB

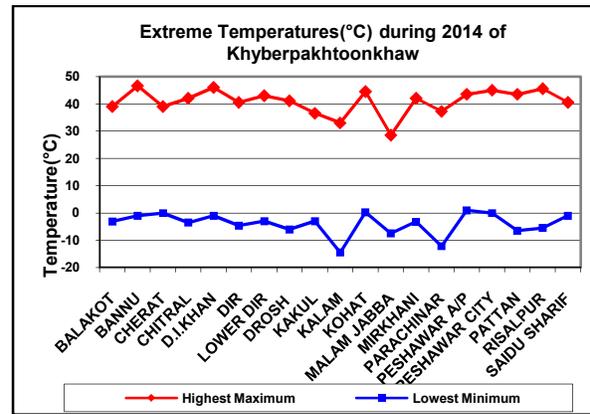


Figure 7 (d): Extreme Temperatures of KPK

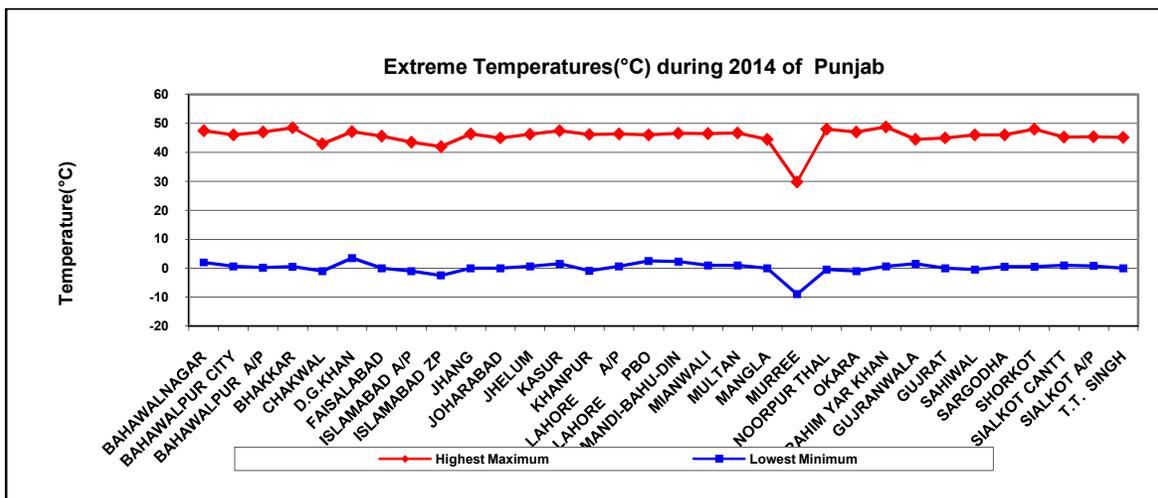


Figure 7 (e): Extreme Temperatures of Punjab

Highest daily Rainfall in 2014 for different cities of Pakistan Province-wise is given in Figure 8(a-e).

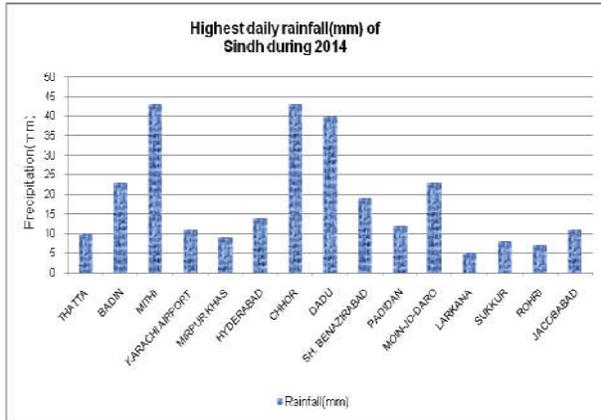


Figure 8 (a): Highest daily Rainfall of Sindh

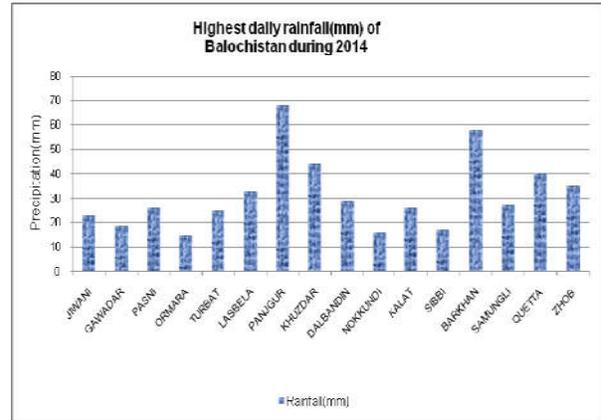


Figure 8 (b): Highest daily Rainfall of Balochistan

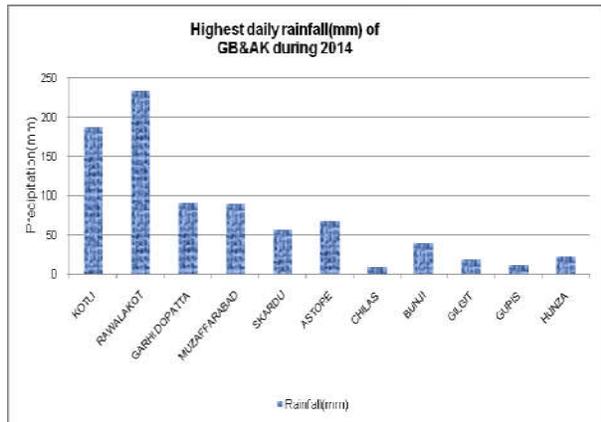


Figure 8 (c): Highest daily Rainfall of AK & GB

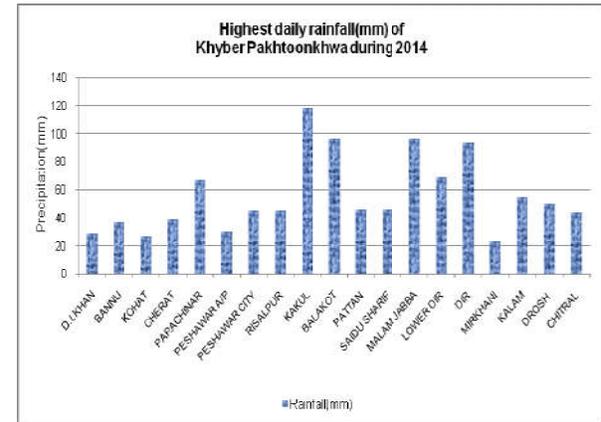


Figure 8 (d): Highest daily Rainfall of KPK

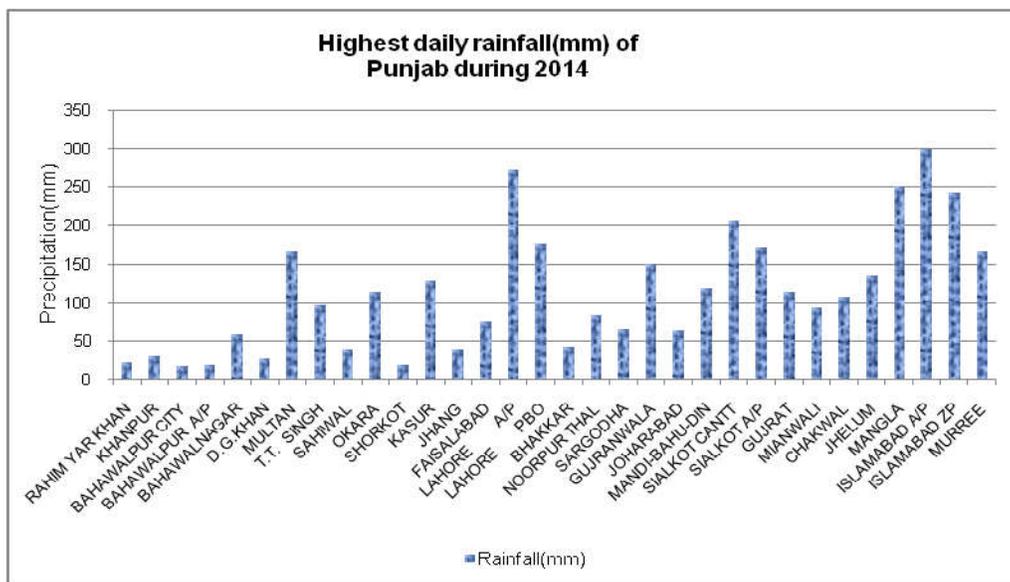


Figure 8 (e): Highest daily Rainfall of Punjab

5. Other extreme Events of 2014

(a) Heat Waves during 2014

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.

In 2014 (Jun and July) certain stations of Pakistan had undergone heat wave. Detail of which is as under:

- i. Jehlum with maximum normal for the month of Jun 40.0°C undergone heat wave from 06 to 11 Jun. Temperatures remained 45.0°C -46.3°C.
- ii. Lahore Air Port with maximum normal for the month of Jun 39. 4°C. undergone heat wave from 04 to 11 Jun. Temperatures remained 44.8°C -46.4°C.
- iii. Lahore PBO with maximum normal for the month of Jun 39. 4°C undergone heat wave from 05 to 10 Jun. Temperatures remained 44.8°C -46.0°C.
- iv. Shorkot with maximum normal for the month of Jun 41.5°C undergone heat wave from 05 to 10 Jun. Temperatures remained 46.5°C -48.0°C.
- v. Sialkot with maximum normal for the month of Jun 39.1°C undergone heat wave from 06 to 11 Jun. Temperatures remained 44.3°C -45.3°C.
- vi. Bunji with maximum normal for the month of Jun 32.6°C undergone heat wave from 25 to 30 Jun. Temperatures remained 37.5°C -40.6°C.
- vii. Gilgit with maximum normal for the month of Jun 33.9°C undergone heat wave from 25 to 30 Jun. Temperatures remained 39.0°C -42.0°C.
- viii. Turbat with maximum normal for the month of Jun 43.8°C undergone heat wave from 17 to 21 Jun. Temperatures remained 49.5°C -50.5°C.
- ix. Muzaffarabad with maximum normal for the month of July 34.9°C undergone heat wave from 10 to 14 July. Temperatures remained 40.0°C - 41.4°C.
- x. Parachinar with maximum normal for the month of July 30.1°C undergone heat wave from 17 to 22 July. Temperatures remained 36.0°C -37.2°C.

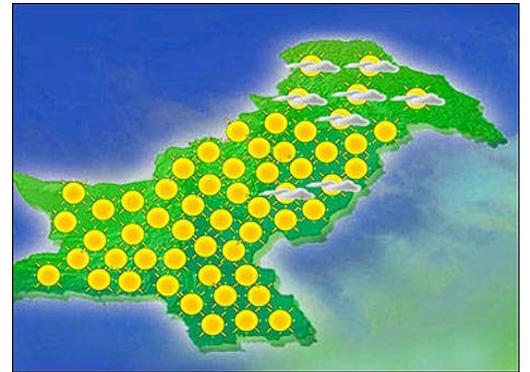


Figure 11: Hot summer in Pakistan during 2014

(b) Flash Flood / Flood in Punjab and Sind in September, 2014

2014 was the fourth consecutive year of high-impact monsoon rains in Pakistan. In early September 2014, heavy rainfall in northern India and Pakistan resulted in widespread flooding in Pakistan provinces of Gilgit Baltistan and Azad Kashmir, Khyber Pakhtunkhwa Punjab and later Sindh. 367 people died in the disaster and more than 2.5 million were affected from over 4000 villages. Nearly 700,000 people were evacuated and flood left over 100,000 homes damaged. Livelihoods were also damaged, in particular agriculture. In Punjab, Gilgit Baltistan and Azad Kashmir more than 2.4 million acres of crops have been lost and 9000 cattle perished.

Major amount of rainfall in the first week and total of September 2014 is given in Table 1 below:

S.No.	City	Rainfall (mm) During 1st week	Rainfall (mm) Total of the month
1	Bahawalnagar	98	98
2	Chakwal	88	121
3	Faisalabad Sialkot	228	234
4	Islamabad	333	438
5	Jehlum	220	239
6	Kasur	284	295
7	Lahore	518	564
8	Mandi Bahauddin	187	235
9	Mangla	345	376
10	Murree	262	302
11	Gujranwala	336	361
12	Gujrat	313	329
13	Sargodha	69	135
14	Sialkot	525	551
15	Toba Tek Singh	113	113
16	Astore	96	102
18	Bunji	50	50
19	Garhi Dopatta	222	262
20	Kotli	432	487
21	Muzaffarabad	132	172
22	Rawlakot	507	547
23	Skardu	122	126
24	Balakot	116	151
25	Kakul	154	195
26	Malam Jabba	56	117

Table 1: Major amounts of rainfall causing Flood 2014

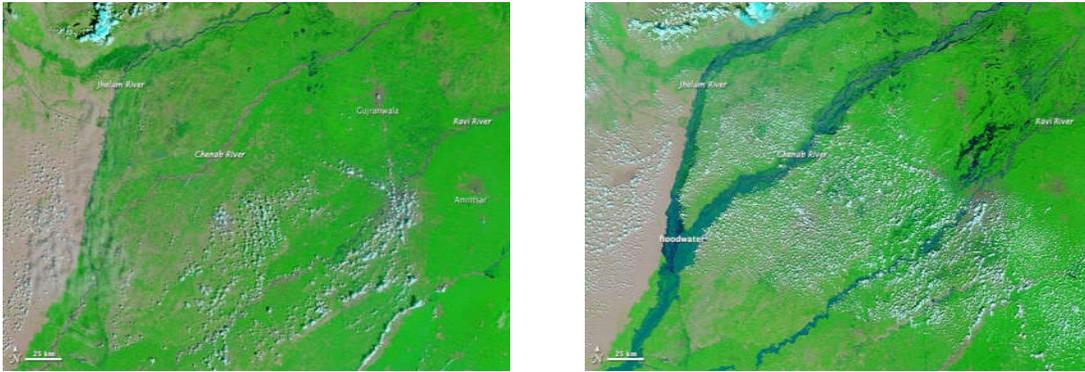


Figure 12 a & b: Satellite images of Pakistan before and during the floods August 31 and September 11, 2014

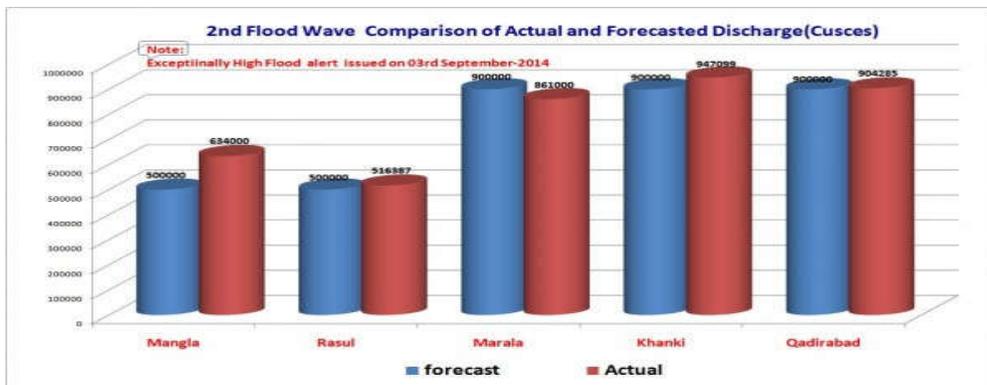


Figure 12c: Comparison of forecasted and actual discharge in Pakistan during flood 2014



Figure 12 d & e: Scenes of flash flood/flooding in Pakistan during 2014

(c) Tropical Cyclone 04 A (NILOFAR) in Arabian Sea in October 2014

A tropical cyclone named 04A (Nilofar) was originated from a low pressure area in the Arabian Sea that intensified into a depression on October 25. It slowly consolidated and reached cyclonic storm strength the following day. The system rapidly intensified in the following days, reaching a peak intensity of 950 mbar (hPa) on October 28. Over time the storm tracked northeastwards towards an area of high vertical wind shear, causing the storm to rapidly weaken. It was the strongest tropical cyclone of 2014 within the North Indian Ocean and the strongest storm to form over the Arabian Sea since Phet in 2010. On October 31 causing minimal damage, the Cyclone weakened into a Low Pressure Area and was located at Latitude 21.5°N and Longitude 65.0°E about 460 km in south-southwest of Karachi. the storm. The name *Nilofar*, referring to the water lily, was suggested by Pakistan.

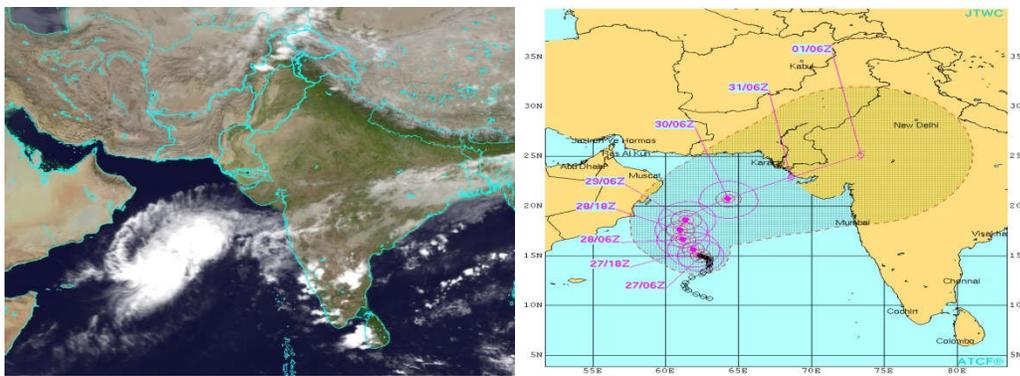


Figure 13 (a) & (b): Satellite image of TC Nilofar with expected course on October 27, 2014

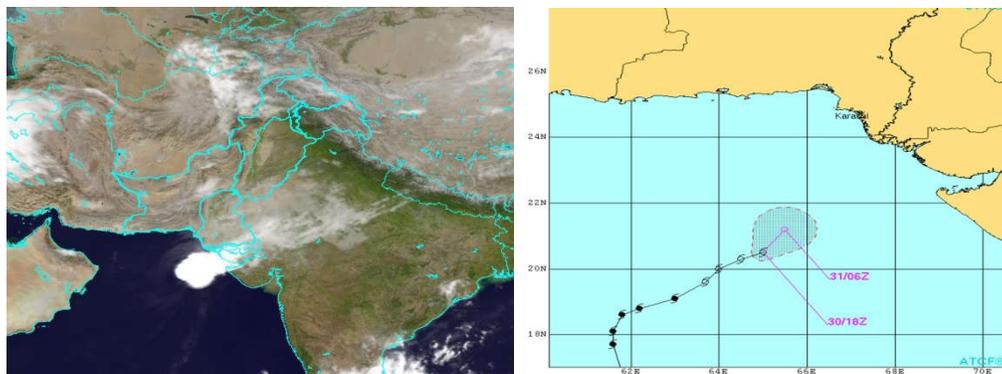


Figure 13 (c) & (d): Satellite image of the dissipating TC Nilofar on October 31 2014

6. Drought Monitor

National Drought Monitoring Centre of PMD monitors drought events on fortnightly basis; according to which 2014 has seen normal to wet conditions in most parts of Punjab, KPK and GB. Parts of central Punjab and Sindh and most of Baluchistan had Mild to Moderate Drought. Western parts of KPK received very good rainfall. Yet Northern Sindh experienced severe drought conditions. Figure 13 below shows the drought conditions of whole Pakistan for 2014.

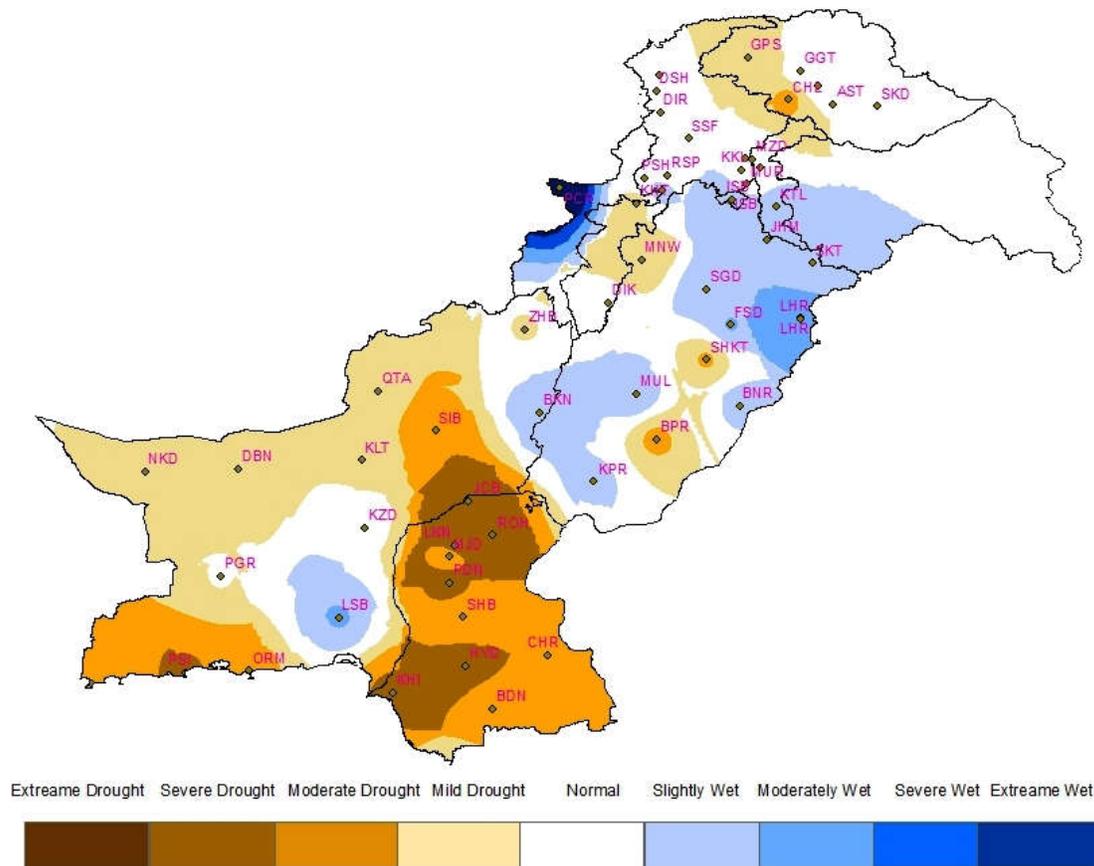


Figure 14: Drought analysis for Pakistan for the year 2014

7. Fog Days

Table 2 below shows number of Foggy days for different stations of Pakistan during 2014.

S.No.	No. of Foggy Days in 2014						
	SIND	Jan	Feb	Mar	Nov	Dec	Total
1	Nawabshah	6	0	0	0	7	13
2	Badin	0	3	0	2	0	5
3	Chhor	0	1	0	1	0	2
4	Mithi	0	2	0	2	0	4
5	Larkana	5	0	0	0	1	6
6	Moenjodaro	9	0	0	0	16	25
7	Mirpurkhas	1	1	0	0	0	2
8	Padidan	3	0	0	0	3	6
9	Rohri	4	0	0	0	9	13
10	Sukkar	13	1	0	3	11	28
11	Jacobabad	2	0	0	0	2	4
12	Tandojam	0	1	0	0	1	2
	BALUCHISTAN						
13	Jiwani	2	0	0	0	0	2
14	Ormara	1	0	0	2	0	3
	PUNJAB						
15	Lahore A/P	8	4	0	0	15	27
16	PBO Lahore	8	1	0	0	15	24
17	Sialkot A/P	16	12	0	8	14	50
18	D.g.khan	4	3	0	0	15	22
19	Bahawalpur A/P	11	17	4	2	20	54
20	Kotli	0	2	0	0	0	2
21	Mangla	7	4	0	4	10	25
22	Skardu	5	0	0	0	0	5
23	Bahawalpur	14	10	3	0	22	49
24	Faisalabad	11	7	0	0	18	36
25	Khanpur	10	12	1	3	18	44
26	Islamabad	1	0	0	0	1	2
27	Multan	9	4	0	1	15	29
28	Bahawalnagar	9	5	0	0	16	30
29	Sargodha	9	5	2	0	15	31
30	Mandi bahuddin	8	2	0	0	14	24
31	Sahiwal	12	8	1	0	17	38
32	Joharabad	17	13	11	0	18	59
33	PBO Sialkot	17	3	0	0	16	36
34	Noor pur thal	10	4	2	0	15	31
35	Jhelum	6	3	0	0	14	23
36	D.i.khan	4	7	0	0	15	26
37	Jhang	11	8	0	0	16	35
38	Gujrat	5	3	0	0	15	23
39	Gujranwala	17	3	0	0	15	35
40	Bhakkar	5	5	0	0	16	26
41	Chakwal	0	1	0	0	0	1
42	Rahim yar khan	6	2	0	0	16	24
	KPK & GB						
43	Peshawar	0	0	0	0	2	2

Table 2: Number of Foggy days for different stations of Pakistan during 2014