



# Pakistan's Monthly Climate Summary August, 2020

## Overview

- National rainfall for the month of August was 108% above normal
- August ranked as Pakistan ever wettest month since 1961
- Sindh and Balochistan experienced exceptionally excessive rainfall of 363% & 271% above average respectively
- Both recorded August ever highest rainfall in last sixty years
- Punjab (+14%), AJK (+12%) & GB (+20%) recorded slightly above average rainfall
- Eleven stations had their wettest August on record and seven had their wettest August day on record
- Total rainfall of August 2020 broke several records at Karachi city
- Total rainfall recorded at Karachi-Faisal 588.0 mm, at Karachi-Masroor 436.0 mm & Karachi-Airport 367.0 mm
- These three were wettest August in 48 years, 63 years & 89 years of record respectively
- Karachi-Faisal site recorded 231.0 mm, the heaviest one day rainfall on record
- This was also the highest 24-hours rainfall for any month among three Karachi sites
- Pakistan mean temperature was above normal at 0.76 °C
- Mean temperature for August of the country was seventh warmest on record
- Pakistan mean maximum temperature was 0.39 °C warmer than average
- National mean minimum temperature was +1.07 °C warmer than average and stood third warmest on record

## Record highest monthly total rainfall (mm)

| SN | Stations        | New Record | Normal | Previous Record | Years of record |
|----|-----------------|------------|--------|-----------------|-----------------|
| 1  | Karachi-Faisal  | 588.0      | 68.0   | 298.4 in 1984   | 48              |
| 2  | Karachi-Masroor | 436.0      | 55.0   | 272 in 2007     | 63              |
| 3  | Karachi-airport | 367.0      | 60.9   | 262.5 in 1979   | 89              |
| 4  | Mirpurkhas      | 348.0      | 76.5   | 163.5 in 2011   | 16              |
| 5  | Mohenjdaro      | 281.0      | 26.6   | 160 in 1994     | 41              |
| 6  | Sibbi           | 212.0      | 39.2   | 106 in 2012     | 89              |
| 7  | Dadu            | 180.0      | 29.9   | 134 in 2015     | 16              |
| 8  | Pattan          | 163.0      | 54.4   | 107.5 in 2013   | 15              |
| 9  | Ormara          | 117.0      | 10.8   | 64.3 in 1975    | 46              |
| 10 | Gawadar         | 32.7       | 2.3    | 20 in 2008      | 18              |
| 11 | Dalbandin       | 15.0       | 0.7    | 14.3 in 1983    | 89              |

## Record highest 24-hours rainfall (mm)

| SN | Stations       | New Records |                | Previous Record |                | Years of record |
|----|----------------|-------------|----------------|-----------------|----------------|-----------------|
|    |                | Amount      | Date           | Amount          | Date           |                 |
| 1  | Karachi-Faisal | 231.0       | 28 August 2020 | 164.0           | 07 August 1979 | 48              |
| 2  | Mirpurkhas     | 162.0       | 25 August 2020 | 125.0           | 01 August 2011 | 16              |
| 3  | Dadu           | 142.0       | 26 August 2020 | 130.0           | 31 August 2011 | 16              |
| 4  | Joharabad      | 96.8        | 20 August 2020 | 70.0            | 25 August 2010 | 13              |
| 5  | Ormara         | 88.0        | 08 August 2020 | 55.0            | 03 August 2013 | 46              |
| 6  | Kasur          | 81.0        | 20 August 2020 | 66.0            | 02 August 2019 | 6               |
| 7  | Gawadar        | 20.5        | 09 August 2020 | 16.0            | 04 August 2008 | 18              |

## August area-weighted rainfall

|                                 | Rank (of 60) | Normal (mm) | Average (mm) | Departure (percent) | Comment                                |
|---------------------------------|--------------|-------------|--------------|---------------------|--|
| <b>Pakistan</b>                 | 60           | 56.2        | 116.7        | 107.7               | 1st highest (record 115.7 mm in 2010)  |
| <b>Sindh</b>                    | 60           | 53.6        | 248.0        | 362.6               | 1st highest (record 195.9 mm in 2011)  |
| <b>Balochistan</b>              | 60           | 22.5        | 83.3         | 271.1               | 1st highest (record 79 mm in 1983)     |
| <b>Punjab</b>                   | 42           | 93.3        | 105.9        | 13.5                | 19th highest (record 282.8 mm in 1973) |
| <b>Khyber Pakhtunkhwa</b>       | 37           | 117.6       | 127.7        | 8.5                 | 24th highest (record 254.1 mm in 2010) |
| <b>Azad Jammu &amp; Kashmir</b> | 44           | 114.1       | 128.0        | 12.1                | 17th highest (record 239.2 mm in 1997) |
| <b>Gilgit Baltistan</b>         | 41           | 17.1        | 20.5         | 20.0                | 20th highest (record 89.6 mm in 1997)  |

Rank ranges from 1 (lowest) to 60 (highest).

## Synoptic Summary

Pakistan received above-average rainfall with southern half (Sindh and Balochistan) recording exceptionally above-average during Aug 2020. Overall five low-pressure areas formed over the Bay of Bengal with two of them attained depression intensity during August 2020 and moved westward, mostly towards southern Pakistan.

On 1<sup>st</sup> August, there was a formation of low-pressure area over the Bay of Bengal (BoB) with another low pressure area over Indian Gujarat and adjoining Northeast Arabian Sea, so as making the traditional monsoon axis oriented east-west. These conditions persisted till 4<sup>th</sup> August with BoB-low having moved little northward which later concentrated into a depression by 5<sup>th</sup> August. The low-pressure area over the East Arabian Sea slightly shifted over land of Indian Gujarat, and another induced low-pressure area was spotted over East Rajasthan, India. These surface features were strong enough to extend up to lower-to-middle atmosphere over the same areas with southwest-ward tilt. Owing to these pronounced synoptic features, Karachi, Sindh and Western Balochistan received heavy/very heavy rainfall spell during 6-8 August.

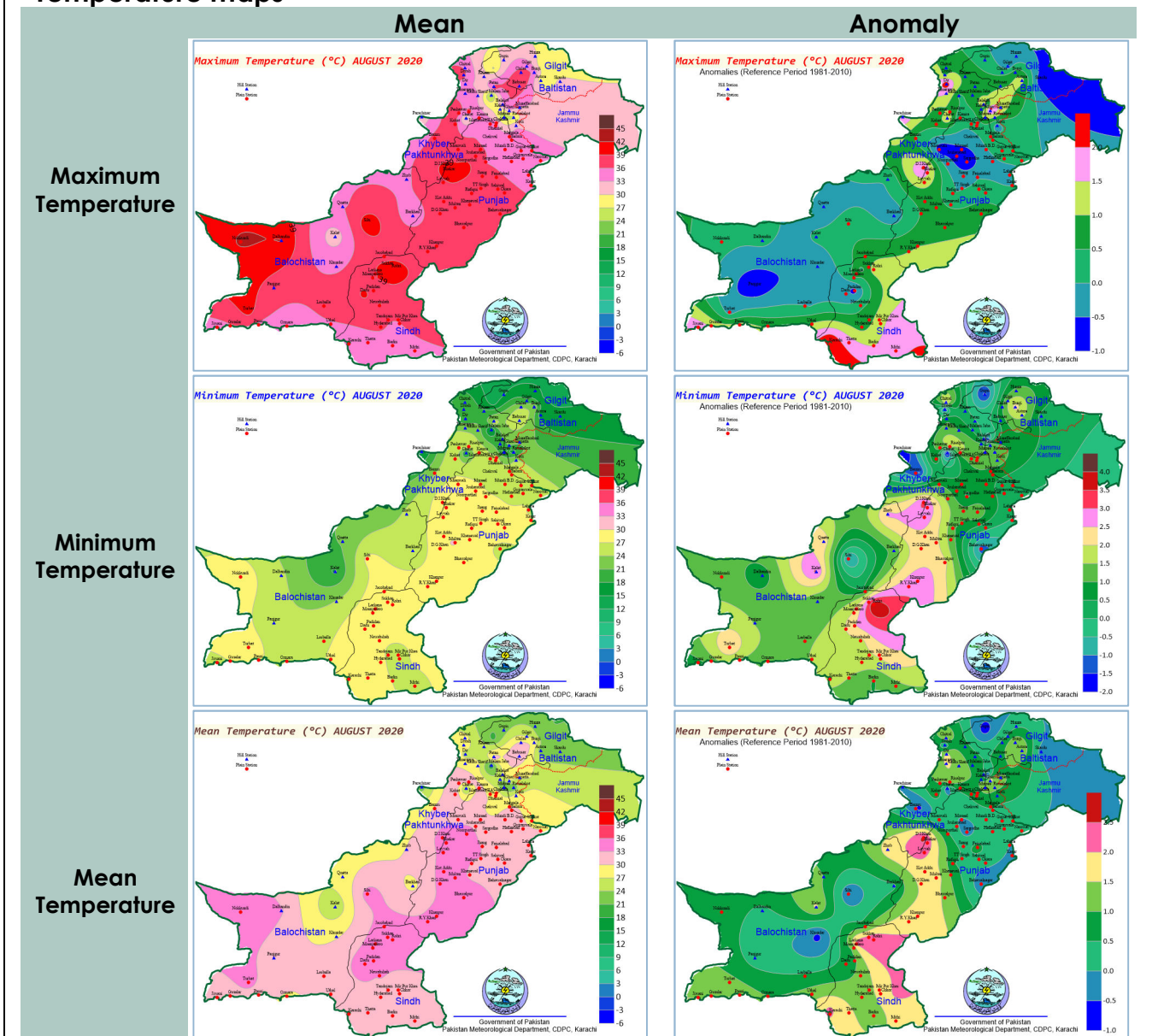
Then on 19<sup>th</sup> August, yet again a well-marked low-pressure area formed over the BOB, with another low-pressure areas over eastern and central India and a trough over southeast Sindh been observed. The same situation carried on to next day (20<sup>th</sup> August) and then on 21<sup>st</sup> August, the former two low-pressure areas merged and lay centred over central and adjoining western India. The same situation persisted over there for following two days and on 24<sup>th</sup> August the low-pressure areas were spotted over Rann of Kutch, India and SE-Sindh and eastern India and adjoining BoB. On 25<sup>th</sup> August, the low over SE-Sindh got more pronounced with low over eastern India and BoB found persisting, and these were the features which produced very heavy spell on the day. On the other hand there was an intrusion of westerly wave from northwest Balochistan which interacted with the monsoon low over SE Sindh and yielded the 24 hour heaviest record-breaking rainfall on 27<sup>th</sup> August.

## Temperatures

The national mean temperature for Pakistan as a whole was above normal at 0.76 °C warmer than the average for August. The mean temperature for August of the country was seventh warmest on record. The mean maximum temperature (day temperature) of the country was 0.39 °C warmer than average. The nights were relatively warm, with mean minimum temperature for August being warmer than country average at +1.07 °C and stood third warmest on record. The mean temperature of August was of  $\pm 1.0$  ranges over major parts of the country.

Mean Maximum temperatures were near to average over major parts of the country except south and eastern parts of Sindh where it stood above average. The mean minimum temperature for the month was above average over Sindh and southern Punjab & KPK by up to +2.0 °C whereas in remaining parts of country it was near to average.

## Temperature maps

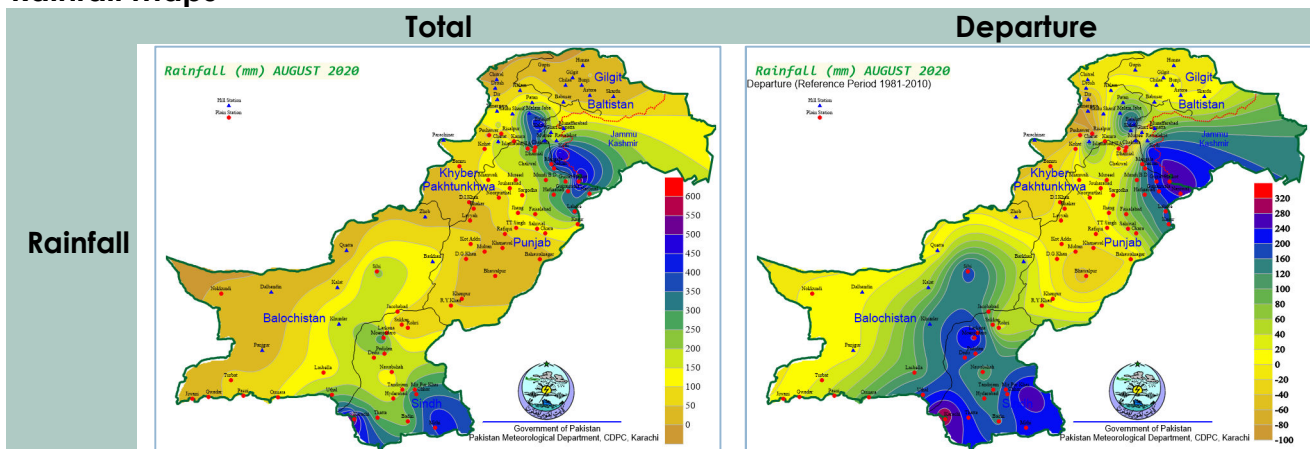


## Rainfall

Two significant rain events occurred during August 2020, both bringing substantial rain to country, especially to southern & eastern parts of Sindh. A number of weather observing sites registered highest ever record of August daily and monthly rainfall totals as a result of these events. National rainfall for the month of August was 108% above normal for Pakistan as a whole and ranked as ever highest wettest month since 1961. The provinces of Sindh and Balochistan experienced exceptionally excessive rainfall of 363% & 271% more than average rainfall respectively and both recorded August highest ever rainfall in last sixty years. Punjab (+14%), AJK (+12%) & GB (+20%) recorded slightly more than average rainfall while KP (+9%) recorded close to monthly average rainfall. These extreme rainfall affected many areas of Sindh & Balochistan provinces. August 2020 was noteworthy for the number of significant rain events occurred. To illustrate this, in Sindh, 6 stations had their wettest August on record and three had their wettest August day on record; in Balochistan these figures were four and two respectively.

The total rainfall of August 2020 at Karachi city were particularly notable. It recorded 588.0 mm at Faisal, 436.0 mm at Masroor & 367.0 mm at Airport and these are wettest August in 48 years, 63 years & 89 years respectively of record. On 28<sup>th</sup> Faisal site recorded 231.0 mm of 24-hours rainfall, which was the heaviest one-day rainfall on record. This was also the highest 24-hours rainfall for any month among three Karachi sites. The previous August record in the city was 209.8 mm at Masroor on 18<sup>th</sup> August 1978, and the previous record for any month was 211.3 mm also at Masroor on 26<sup>th</sup> July, 1967. As a result of the unprecedented August rainfall, one of the history's major urban flooding occurred at Metropolis of Karachi affecting millions of people and inflicting widespread infrastructure damages.

## Rainfall maps



## Monthly averages & normals

| Station    | Pressure (mb) |           | Temperature (°C) |         |         | Vapour (mb)<br>Pressure | Precipitation |      |
|------------|---------------|-----------|------------------|---------|---------|-------------------------|---------------|------|
|            | Station Level | Sea Level | Mean             | Maximum | Minimum |                         | Total (mm)    | Days |
| Drosh      | 844.4         | 1405.2    | 29.3             | 36.9    | 20.7    | 18.2                    | 0             | 0    |
|            | 845.9         | 1420.8    | 28.7             | 35.9    | 22.3    | 15.8                    | 20.0          | 4.7  |
| Peshawar   | 962.4         | 997.9     | 32.2             | 37.8    | 25.5    | 33.0                    | 39.2          | 4    |
|            | 958.9         | 997.9     | 30.6             | 36.0    | 25.7    | 29.2                    | 72.6          | 7.7  |
| Parachinar | 824.8         | 1464.9    | 20.7             | 30.9    | 14.5    | 14.7                    | 53.0          | 12   |
|            | 822.4         | 1437.8    | 23.2             | 28.8    | 17.2    | 18.4                    | 97.4          | 12.5 |
| Rawalpindi | 944.2         | 999.2     | 29.7             | 34.0    | 25.2    | 30.3                    | 235.1         | 14   |
|            | 944.0         | 999.2     | 28.2             | 33.4    | 23.6    | 28.5                    | 348.1         | 16.7 |
| Sargodha   | ----          | ----      | ----             | ----    | ----    | ----                    | ----          | --   |
|            | 978.6         | 999.3     | 31.4             | 36.5    | 26.6    | 31.4                    | 131.7         | 8.9  |
| Jhelum     | 972.3         | 998.0     | 30.4             | 34.9    | 26.2    | 34.3                    | 372.7         | 11   |
|            | 973.8         | 999.0     | 29.7             | 34.4    | 25.3    | 31.1                    | 251.6         | 14.8 |
| Sialkot    | 971.0         | 999.1     | 29.2             | 33.6    | 25.2    | 32.4                    | 547.4         | 16   |
|            | 971.6         | 999.6     | 29.0             | 33.2    | 24.8    | 31.8                    | 323.5         | 14.2 |
| Zhob       | 849.7         | 1401.4    | 29.8             | 35.7    | 24.5    | 18.9                    | 24.0          | 4    |
|            | 850.5         | 1410.3    | 28.7             | 35.4    | 22.4    | 17.7                    | 49.7          | 3.7  |
| D.I.Khan   | 977.8         | 996.5     | 33.7             | 39.5    | 28.8    | 35.5                    | 47.0          | 3    |
|            | 979.4         | 997.4     | 31.3             | 37.3    | 26.0    | 31.3                    | 61.7          | 5.6  |
| Lahore     | 974.8         | 998.4     | 31.0             | 34.7    | 27.2    | 34.3                    | 316.3         | 9    |
|            | 975.5         | 999.1     | 30.5             | 34.9    | 26.5    | 31.5                    | 194.5         | 12.7 |
| Quetta     | 834.9         | 1429.7    | 28.0             | 34.8    | 21.5    | 12.3                    | 20.0          | 3    |
|            | 834.3         | 1423.2    | 27.1             | 35.0    | 18.3    | 12.5                    | 13.2          | 1.5  |
| Multan     | 983.7         | 997.8     | 33.9             | 38.2    | 30.1    | 34.0                    | 17.0          | 4    |
|            | 984.6         | 998.3     | 32.4             | 37.6    | 27.9    | 30.8                    | 36.4          | 3.5  |
| Barkhan    | 881.0         | 1413.4    | 28.7             | 34.3    | 23.9    | 24.1                    | 130.0         | 5    |
|            | 882.8         | 1428.6    | 28.2             | 34.5    | 23.2    | 22.2                    | 87.7          | 4.8  |
| Nokkundi   | 921.3         | 992.5     | 35.4             | 42.2    | 28.7    | 7.0                     | 9.0           | 1    |
|            | 923.7         | 995.1     | 34.5             | 41.7    | 26.7    | 11.7                    | 0.4           | 0.1  |
| Dalbandin  | 906.0         | 1417.7    | 34.7             | 42.0    | 24.6    | 13.2                    | 15.0          | 3    |
|            | 907.0         | 1433.4    | 33.7             | 40.8    | 22.4    | 9.3                     | 0.3           | 0.1  |
| Jacobabad  | 990.5         | 996.6     | 34.2             | 38.4    | 28.9    | 37.0                    | 133.0         | 6    |
|            | 991.8         | 997.9     | 33.1             | 37.8    | 28.2    | 32.2                    | 35.4          | 1.3  |
| Khanpur    | 986.6         | 996.3     | 33.1             | 38.7    | 29.1    | 35.3                    | 39.0          | 3    |
|            | 988.3         | 998.2     | 32.3             | 38.1    | 25.9    | 30.4                    | 17.4          | 1.8  |
| Panjgur    | 892.2         | 1410.4    | 31.0             | 37.4    | 25.0    | 18.4                    | 19.0          | 3    |
|            | 895.9         | 1437.3    | 30.9             | 38.1    | 23.4    | 10.1                    | 7.4           | 0.5  |
| Khuzdar    | 868.5         | 1421.5    | 29.3             | 35.3    | 24.2    | 15.3                    | 185.5         | 10   |
|            | 868.5         | 1411.7    | 29.3             | 35.7    | 22.9    | 9.0                     | 57.4          | 3.4  |
| Nawabshah  | 993.4         | 996.6     | 33.1             | 39.2    | 27.7    | 32.4                    | 150.7         | 5    |
|            | 995.1         | 998.9     | 31.9             | 38.6    | 26.0    | 31.8                    | 46.3          | 1.6  |
| Jiwani     | 992.3         | 998.6     | 29.9             | 33.5    | 26.2    | 32.9                    | 9.0           | 2    |
|            | 994.5         | 1000.8    | 28.3             | 31.0    | 25.6    | 29.2                    | 2.1           | 0.5  |
| Pasni      | 997.8         | 998.3     | 30.6             | 34.1    | 27.2    | 36.6                    | 64.5          | 3    |
|            | 1000.0        | 1000.8    | 28.7             | 32.2    | 25.9    | 30.1                    | 11.5          | 0.2  |
| Hyderabad  | 992.5         | 997.3     | 31.7             | 36.4    | 28.3    | 33.8                    | 195.3         | 8    |
|            | 995.6         | 999.6     | 30.4             | 36.0    | 26.6    | 29.1                    | 63.1          | 2.4  |
| Chhor      | 996.9         | 997.6     | 31.6             | 36.8    | 27.6    | 35.4                    | 344.1         | 11   |
|            | 999.1         | 992.1     | 29.9             | 34.7    | 25.4    | 30.2                    | 69.3          | 3.2  |
| Karachi    | 995.9         | 998.6     | 30.9             | 34.5    | 28.1    | 35.9                    | 366.8         | 10   |
|            | 998.6         | 1001.2    | 28.7             | 31.9    | 26.2    | 29.8                    | 60.1          | 2.8  |

Note: The first row against each station contains the actual values while second row for normal values

## National extreme weather

|               |          |   |
|---------------|----------|---|
| Hottest day   | 47.5 °C  | at Turbat (Balochistan) on the 5 <sup>th</sup>    |
| Coldest day   | 15.0 °C  | at Bagrote (GB) on the 27 <sup>th</sup>           |
| Coldest night | 9.3 °C   | at Skardu (GB) on the 28 <sup>th</sup>            |
| Warmest night | 34.5 °C  | at Thatta (Sindh) on the 13 <sup>th</sup>         |
| Wettest day   | 231.0 mm | at Karachi-Faisal (Sindh) on the 28 <sup>th</sup> |
| Wettest month | 588.0 mm | at Karachi-Faisal (Sindh)                         |

## Extreme values of month

| STATION    | Mean Temperature (°C) |      |        |      | Temperature (°C) |      |        |      | Highest (mm & knots) |      |            |      |
|------------|-----------------------|------|--------|------|------------------|------|--------|------|----------------------|------|------------|------|
|            | Highest               | Date | Lowest | Date | Highest          | Date | Lowest | Date | Rain                 | Date | Wind Speed | Date |
| Drosh      | 32.3                  | 17   | 24.4   | 31   | 40.4             | 17   | 15.6   | 28   | 0.0                  | 0    | 14         | 7*   |
| Peshawar   | 35.9                  | 7    | 26.3   | 31   | 43.6             | 13   | 19.5   | 27   | 18.2                 | 20   | 6          | 2*   |
| Parachinar | 24.3                  | 2    | 16.5   | 27   | 34.5             | 2    | 11.0   | 31   | 9.0                  | 11   | 7          | 6*   |
| Rawalpindi | 33.6                  | 6    | 23.8   | 31   | 39.3             | 6    | 22.2   | 31   | 63.8                 | 26   | 18         | 3    |
| Sargodha   | ----                  | --   | ----   | --   | ----             | --   | ----   | --   | ----                 | --   | ----       | --   |
| Jhelum     | 34.1                  | 12   | 24.6   | 27   | 39.5             | 5*   | 22.2   | 19   | 83.8                 | 28   | 16         | 4    |
| Sialkot    | 31.9                  | 12   | 24.5   | 27   | 37.5             | 5*   | 21.5   | 1    | 159.0                | 28   | 10         | 3    |
| Zhob       | 33.3                  | 13   | 24.3   | 27   | 40.0             | 13*  | 20.0   | 27   | 12.0                 | 27   | 13         | 17   |
| D.I.Khan   | 37.0                  | 13   | 25.9   | 31   | 43.5             | 13*  | 24.5   | 20   | 45.0                 | 20   | 8          | 20   |
| Lahore     | 34.3                  | 6*   | 26.1   | 20   | 39.2             | 3    | 22.8   | 3    | 118.0                | 20   | 18         | 19   |
| Quetta     | 31.6                  | 17   | 23.4   | 29   | 39.5             | 16*  | 15.0   | 29   | 14.0                 | 10   | 30         | 7    |
| Multan     | 37.4                  | 17   | 26.5   | 31   | 41.5             | 5    | 26.4   | 27   | 12.0                 | 11   | 16         | 19   |
| Barkhan    | 32.6                  | 3    | 23.1   | 77   | 39.0             | 3    | 20.5   | 28   | 42.0                 | 27   | 6          | 7*   |
| Nokkundi   | 39.3                  | 16   | 30.0   | 31   | 47.0             | 16   | 23.5   | 30   | 9.0                  | 9    | 26         | 11   |
| Dalbandin  | 38.0                  | 17   | 29.1   | 8    | 45.5             | 15   | 20.0   | 31   | 7.8                  | 9    | 12         | 3*   |
| Jacobabad  | 36.9                  | 5    | 28.1   | 26   | 42.0             | 51   | 24.0   | 8    | 60.0                 | 27   | 10         | 31   |
| Khanpur    | 36.0                  | 3    | 27.0   | 31   | 43.0             | 3    | 26.4   | 8    | 33.0                 | 8    | 12         | 6    |
| Panjgur    | 34.0                  | 3    | 26.3   | 26   | 41.0             | 6*   | 22.0   | 26   | 7.0                  | 25   | 40         | 23   |
| Khuzdar    | 33.1                  | 5    | 23.9   | 26   | 39.5             | 14   | 21.0   | 28   | 51.0                 | 8    | 12         | 24   |
| Nawabshah  | 36.1                  | 3*   | 26.8   | 31   | 44.5             | 3    | 24.5   | 76   | 48.6                 | 26   | 25         | 6    |
| Jiwani     | 32.5                  | 5    | 26.8   | 8    | 37.5             | 5    | 24.0   | 31   | 5.0                  | 9    | 14         | 30   |
| Pasni      | 32.1                  | 2*   | 28.6   | 9    | 36.5             | 6*   | 20.5   | 25   | 61.5                 | 8    | 16         | 3*   |
| Hyderabad  | 34.6                  | 1    | 26.4   | 25   | 41.0             | 6    | 25.0   | 25   | 128.0                | 25   | 30         | 6    |
| Chhor      | 36.0                  | 5    | 25.8   | 31   | 42.8             | 5    | 24.0   | 30   | 110.6                | 25   | 12         | 4*   |
| Karachi    | 33.3                  | 2    | 27.5   | 25   | 39.1             | 6    | 24.0   | 28   | 121.9                | 28   | 16         | 4*   |

\* means value occurred multiple times

### Note

Monthly Climate Summary is produced by Pakistan Meteorological Department, Climate Data Processing Centre, Karachi to provide the main features of Pakistan weather events occurred in Pakistan during the month. The summary contains detail data information of 25 climate stations of Pakistan. The extremes & analysis is based on 110 national climate stations. The information in the summary is based on real time data and/or electronic reports, therefore, the information contained above can be considered only preliminary. Climate Summaries are usually published in the first 10 days of each month. Long term average for rainfall is for 1961-2010 while normal period for temperature is 1981-2010.

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