



Pakistan's Monthly Climate Summary SEPTEMBER, 2021

Overview

- September 2021 rainfall was 60% above average for Pakistan as a whole and stood as thirteenth highest rainfall on record.
- Rainfall for the month was above average across much of the country, and very much above average for September in large parts of South Pakistan and areas of Punjab province.
- AJK (+17.7%), Punjab (+44.6%), Balochistan (63.5 %) and Sindh (234.9 %) were wettest regions. Sindh had experienced its ninth heaviest rainfall on record.
- The wettest day of the month in the country was 8th September, when PAF Nur Khan (Punjab) recorded 169 mm of rain.
- Chhor (Sindh) broke its year 2011 record of 84 mm 24-hours rainfall record on 28 September when it recoded 100 mm rainfall.
- The national mean monthly temperature of September 2021 for Pakistan as a whole was 29.39 °C, being 1.62 °C warmer than monthly-average,
- National mean temperature of September was the third warmest while Sindh, AJK and Balochistan recorded their 1st, 2nd and 3rd warmest month on record respectively.
- GB, KP & Punjab mean temperature were among ten hottest month on record.
- The mean maximum temperature was 35.54 °C, being 1.00 °C warmer than average.
- The minimum temperature was 23.18 °C, being 2.16 °C warmer than average.
- The hottest days of the month were at Dadu (Sindh) and Turbat (Balochistan) with 44.5 °C temperature on 6th & 14th September respectively.
- The negative Indian Ocean Dipole (IOD) event weakened, with latest IOD value falling shy of negative IOD threshold.
- El Nino-Southern Oscillation (ENSO) continued to be neutral in September 2021.

National weather extremes during SEPTEMBER 2021

Hottest day	44.5 °C	at Dadu (Sindh) on the 6 th at Turbat (Balochistan) on the 14 th
Coldest day	15.0 °C	at Babusar (KP) on the 1 st
Coldest night	7.0 °C	at Babusar (KP) on the 2 nd at Astore (GB) on the 2 nd
Warmest night	31.5 °C	at Jacobabad (Sindh) on the 8 th
Wettest day	169.0 mm	at Chaklala Airbase (Punjab) on the 8 th
Wettest month	323.9 mm	at Jhelum (Punjab)

Synoptic Summary

On September 1, 2021, the monsoon low-pressure area was prevailing over west Rajasthan (India) and adjoining eastern Sindh inducing strong monsoon currents'

penetration all along eastern parts of the country. This situation persisted through the following two days yielding good rains in lower Sindh and upper half of the country. The seasonal/heat low while oriented around northwest Balochistan and adjoining areas. From 6 to 11 September, strong monsoon currents again converged over upper & eastern parts of the country due to well-positioned monsoon trough. Meanwhile, another monsoon low approached over west Rajasthan, India on 8 September and persisted till 11 September which produced another rainy spell in eastern & southern Sindh during 9-11 September. On 12 September, a depression formed over the Bay of Bengal which ultimately concentrated into a deep depression next day and moved as a depression first over eastern and then over central India, persisted over there for following few days and caused strong monsoon currents' incursion over eastern parts of Pakistan. On the other hand, the persistent trough over Indian Rajasthan-Gujarat accentuated into a low over there on 22 September, shifted over southeast Sindh the next day and resulted in rain-thunderstorms in southern Sindh during 23-25 September.

Cyclonic Storm GUL-AAB over Bay of Bengal

A low-pressure area formed over the west-central Bay of Bengal on 24 September, strengthened into a depression and further intensified into a Cyclonic Storm, CS (GUL-AAB) on 25 September. The CS, Gul-Aab moved westward and crossed the Andhra Pradesh-Odisha coast, India on 26 September night. After crossing over the coast, the system first turned into a depression and then a low-pressure and moved towards Indian Gujarat. The system then emerged as a well-marked low over Northeast Arabian Sea, intensified into a Depression on 29 September and Deep Depression the subsequent day which pushed strong monsoon currents in Sindh and again resulted in rain-thunderstorms in southern Sindh during 28-30 September.

September, 2021 area-weighted rainfall

	Rank (of 61)	Normal (mm)	Average (mm)	Departure (percent)	Comment
Pakistan	49	21.4	34.3	60.3	13 th wettest (record 95.9 mm in 2012)
Azad Jammu & Kashmir	43	50.2	59.0	17.7	---
Balochistan	49	6.2	10.2	63.5	13 th wettest (record 44.2mm in 2012)
Gilgit Baltistan	35	10.5	8.4	-19.5	---
Khyber Pakhtunkhwa	30	51.2	51.0	-0.5	---
Punjab	46	34.6	50.1	44.6	---
Sindh	53	19.9	66.7	234.9	9 th wettest (record 217 mm in 2011)

Rank ranges from 1 (lowest) to 61 (highest)

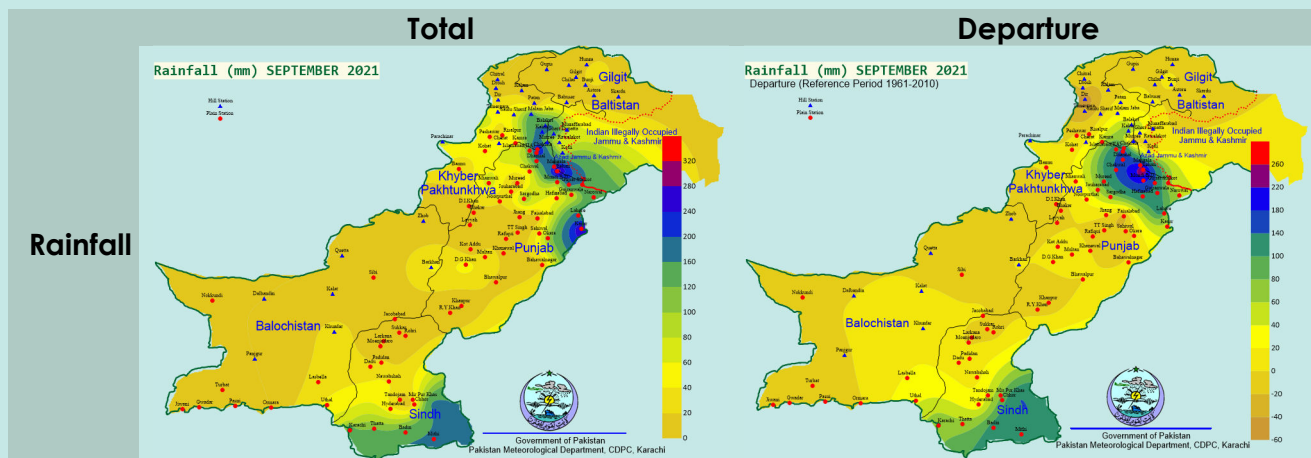
Rainfall – Excessively above average over the country

September 2021 rainfall was 60% above average for Pakistan as a whole and stood thirteenth highest on record for the country during 1961-2021. Rainfall for the month was above average across much of the country, and largely above average for September in most parts of South Pakistan and areas of Punjab province. In Pakistan, although the September normally happens to be the last month of monsoon season

but its contribution to monsoon and annual rainfall is nominal. September 2021 saw just opposite to its normal behavior with record 34.3 mm rain (area weighted) against its normal 21.4 mm. On average, the September rainfall contribution is of the order of 15% and 7% to the monsoon (JAS) and annual rainfall respectively.

On regional scale, all the regions/provinces except KP & GB witnessed more than average monthly rainfall. AJK (+17.7%), Punjab (+44.6%), Balochistan (63.5 %) and Sindh (234.9 %) were wettest regions, with Sindh experienced its ninth heaviest rainfall on record. The wettest day of the month in the country was 8th September, when PAF Nur Khan (Punjab) recorded 169 mm of rain and Chhor (Sindh) broke its year 2011 record of 84 mm 24-hours rainfall record on 28 September when it recorded 100 mm rainfall. Apart from this, Jhelum and Lahore recorded one of the heaviest 24-hours rainfall of the month to the order of 115.6 mm and 95.9 mm respectively. Jhelum (Punjab) being the wettest place with 323.9 mm monthly total. The other chief amounts of monthly rainfall were: Jhelum (323.9 mm), Kasur (282 mm), Nur Khan (253.8 mm), Islamabad (222.7 mm) & Mangla (201.9 mm).

SEPTEMBER 2021 rainfall maps



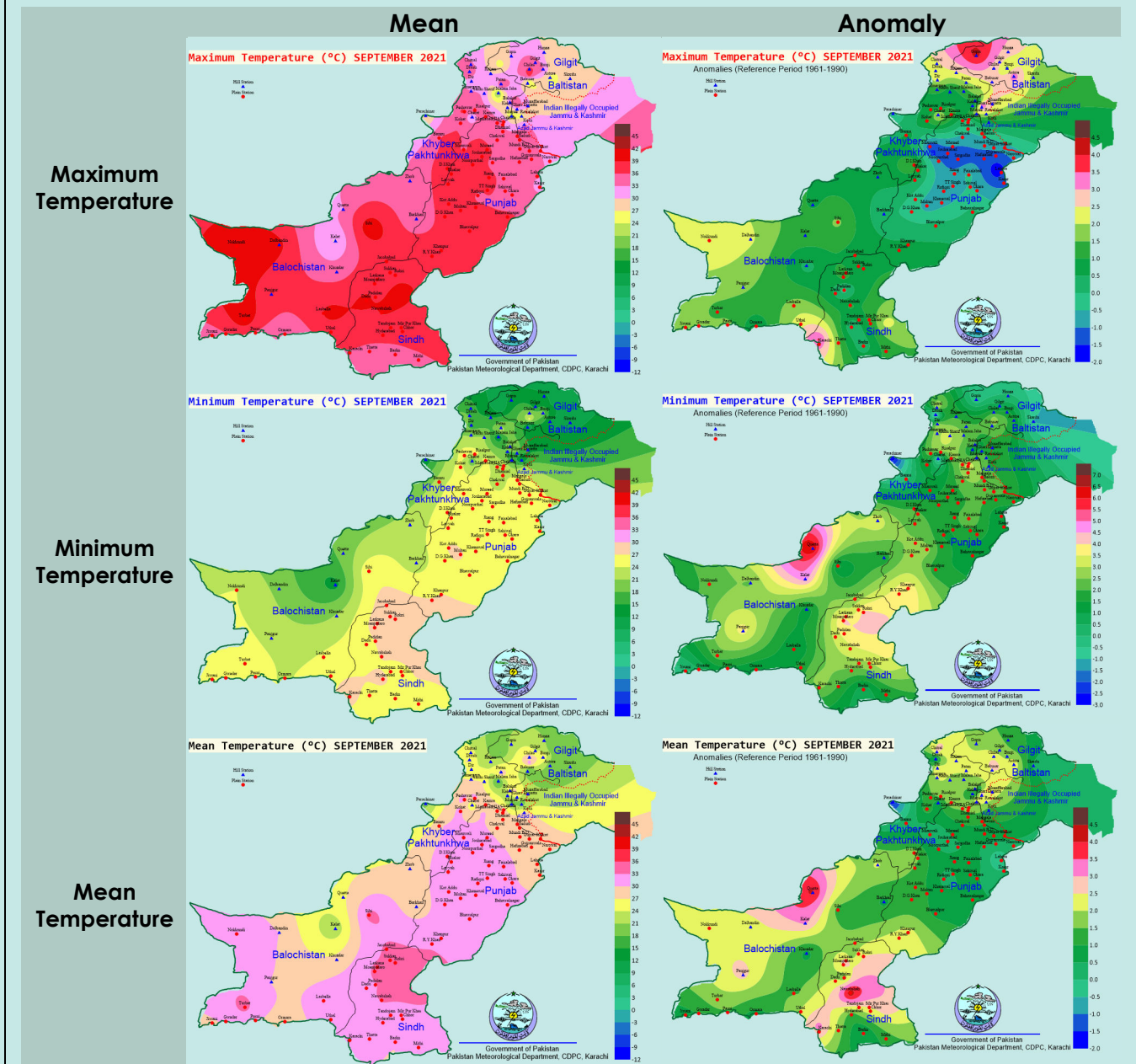
Temperatures – Warmer than average temperature over Country

The national mean monthly temperature of September 2021 for Pakistan as a whole was 29.39 °C, being 1.62 °C warmer than monthly-average. This makes the September mean temperature as the third warmest month on record during period 1961-2021, while 2019 temperature of 29.79 °C is the highest on record. On regional scale, Sindh (+1.62 °C), AJK (+1.82 C) and Balochistan (+1.92 C) recorded their 1st, 2nd and 3rd warmest month on record respectively while the other regions (GB=+1.47 °C, KP =+0.98 °C, Punjab=+0.86 °C) were among ten hottest month on record. The mean maximum (day) temperature at country-level was 35.54 °C, being 1.00 °C warmer than average of 34.54 °C. The night (minimum) temperature was 23.18 °C, being 2.16 °C warmer than country-average of 21.02 °C. The mean

temperature anomalies of September were 0-2 °C over most parts of the country except parts of Balochistan and Sindh where it was around 4 °C.

Mean Maximum temperatures' anomalies were 0-2 °C over most parts of the country except GB & adjoining area around 2-4 °C. The mean minimum temperature anomalies for the month were ± 2 °C over most parts of country with anomalies over eastern Balochistan region considerably very higher. The hottest days of the month were at Dadu (Sindh) and Turbat (Balochistan) when they recorded 44.5 °C temperature on 6th & 14th September respectively. The coldest temperature of 7.0 °C of the month were recorded at Babusar (KP) and Astore (GB) on 2nd September 2021 at both places.

SEPTEMBER 2021 Temperature maps



September 2021 Monthly Averages & Normals

Station	Pressure (mb)		Temperature (°C)			Vapour (mb)	Precipitation	
	Station Level	Sea Level	Mean	Maximum	Minimum	Pressure	Total (mm)	Days
Drosh	849.4	1457.7	26.4	35.2	16.3	14.3	5.8	2
	850.3	1466.6	25.1	33.1	18.2	11.4	21.8	4.8
Peshawar	968.0	1003.9	30.4	36.5	24.9	30.0	37.0	3
	963.7	1003.3	28.5	35.2	22.7	24.0	22.2	4.4
Parachinar	823.9	1458.2	18.3	26.5	12.8	14.7	66.5	5
	825.6	1473.5	21.0	27.2	14.3	13.1	55.4	8.4
Rawalpindi	949.7	1005.3	28.2	33.3	24.0	25.0	253.8	5
	948.3	1004.3	26.6	33.5	20.7	23.1	113.2	8.7
Sargodha	981.3	1001.5	30.4	35.4	26.0	32.0	92.5	6
	983.3	1004.1	30.0	36.3	24.2	26.2	27.7	4.3
Jhelum	978.0	1003.9	29.5	34.5	25.4	32.2	323.9	7
	978.0	1004.0	28.6	34.7	23.1	26.3	74.5	7.1
Sialkot	976.3	1004.7	28.5	32.9	24.6	30.9	158.3	10
	976.1	1004.4	27.8	33.2	22.6	27.4	90.7	6.8
Zhob	854.6	1452.8	27.8	33.5	22.4	17.0	0.0	0
	854.6	1451.4	26.4	33.2	19.1	12.9	11.5	1.2
D.I.Khan	984.2	1003.2	31.9	38.2	25.8	31.2	16.0	2
	983.9	1003.0	29.7	36.5	23.6	26.4	20.8	2.1
Lahore	980.8	1004.7	29.2	33.0	25.3	31.1	176.5	8
	980.0	1003.8	29.5	35.0	24.6	26.4	65.1	6.4
Quetta	839.5	1479.2	26.4	32.9	19.2	9.4	0.0	0
	838.5	1469.6	22.2	31.6	11.7	9.0	2.5	0.4
Multan	989.7	1003.3	32.0	36.5	27.6	30.5	36.0	1
	989.8	1003.4	30.5	36.9	24.9	26.4	24.9	1.7
Barkhan	885.8	1460.0	27.2	33.6	22.1	20.6	44.0	5
	886.4	1465.7	26.7	33.6	20.6	16.5	44.5	3
Nokkundi	926.8	999.1	33.0	40.5	24.0	5.9	0.0	0
	929.4	1002.0	30.7	38.6	22.2	9.4	0.0	0
Dalbandin	911.5	1466.0	31.8	39.8	20.1	10.4	0.0	0
	912.6	1474.4	29.5	37.2	16.5	6.3	0.0	0.1
Jacobabad	996.5	1002.7	33.3	37.8	28.4	32.7	12.0	1
	996.3	1003.2	31.4	36.8	26.0	28.2	11.0	0.4
Khanpur	992.7	1002.5	32.0	37.6	27.0	32.6	0.0	0
	993.4	1003.3	30.2	36.7	22.9	26.7	14.6	1.2
Panjgur	898.2	1467.2	30.3	37.0	22.7	12.4	0.0	0
	899.7	1476.7	27.9	35.4	19.3	8.3	2.5	0.4
Khuzdar	871.0	1446.0	28.0	34.3	21.3	10.6	28.2	2
	872.5	1451.4	27.5	34.2	20.0	6.1	7.9	1.5
Nawabshah	999.0	1002.2	32.7	39.5	27.1	31.7	29.0	8
	1000.3	1004.0	30.7	38.6	23.7	28.1	16.2	1
Jiwani	996.9	1003.3	28.9	33.0	24.0	31.0	0.0	0
	999.3	1005.7	27.9	31.5	24.3	28.2	0.3	0.1
Pasni	1003.0	1003.5	29.6	34.3	24.7	30.5	0.0	0
	1004.2	1004.8	27.8	32.6	23.6	27.5	1.2	0.2
Hyderabad	997.4	1002.2	31.7	36.9	27.7	30.5	45.6	5
	1000.6	1004.2	30.3	36.4	25.3	26.8	12.6	0.8
Chhor	1001.4	1002.1	32.0	37.9	27.2	33.4	174.9	8
	1003.8	996.9	29.7	36.0	23.7	27.3	37.3	1.4
Karachi	1000.2	1002.8	31.3	36.2	28.0	32.3	88.3	6
	1003.2	1005.9	28.7	32.8	25.4	27.8	10.2	0.8

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

September 2021 extreme values

STATION	Mean Temperature (°C)				Temperature (°C)				Highest (mm & knots)			
	Highest	Date	Lowest	Date	Highest	Date	Lowest	Date	Rain	Date	Wind Speed	Date
Drosh	28.3	18*	22.1	1	37.8	18	12.8	1	3.2	11	14	4*
Peshawar	32.6	6*	26.5	8	39.5	3	22.0	23	31.0	9	4	2*
Parachinar	21.1	26	15.3	18	29.5	4	9.0	14*	34.0	22	5	1*
Rawalpindi	31.3	6	24.3	8	35.7	6	19.5	23	169.0	8	16	3*
Sargodha	33.5	6	26.5	9	39.0	6*	23.0	9	59.1	9	8	3*
Jhelum	32.6	6	24.8	8	38.0	6	19.7	23	115.6	23	10	21
Sialkot	30.8	6*	24.6	8	35.0	15*	20.3	24	58.0	20	8	3*
Zhob	30.0	18	24.1	1	36.5	17*	20.0	1*	0.0	0	11	23
D.I.Khan	34.1	7	27.9	23	41.0	7	19.7	24	14.0	22	8	8
Lahore	32.6	6	24.0	61	36.5	6	20.7	2	95.9	11	8	8
Quetta	29.0	7	23.1	29	35.5	6*	15.5	13	0.0	0	24	29
Multan	34.8	7	29.1	11	39.3	18	24.0	22	36.0	22	18	16
Barkhan	30.6	18	23.9	24	36.5	7*	19.0	23	22.0	8	4	13*
Nokkundi	35.5	7	30.5	12	43.0	4*	19.0	14	0.0	0	24	9
Dalbandin	34.6	5	29.6	26	42.5	7	16.5	22	0.0	0	6	1*
Jacobabad	36.1	8	30.9	9	41.0	7	26.0	9	12.0	9	6	20*
Khanpur	34.5	19	29.8	12	40.5	16	25.0	13	0.0	0	10	24*
Panjgur	32.5	8	27.8	30	39.0	6*	19.0	73	0.0	0	16	29*
Khuzdar	30.8	7	23.9	1	37.5	7*	18.5	28	26.0	1	8	15*
Nawabshah	34.5	8	29.9	77	42.5	8	25.5	10*	12.0	15	14	24
Jiwani	31.5	30	27.9	5	38.0	30	22.5	26*	0.0	0	12	1*
Pasni	32.0	16	28.4	57	41.5	16	24.0	12*	0.0	0	22	1
Hyderabad	34.6	14	29.1	59	39.3	8	25.0	9*	25.3	4	18	30
Chhor	34.5	5	28.6	22	41.2	27	23.0	11	100.0	28	10	19
Karachi	34.9	15	27.3	4	40.5	1	24.7	5	61.0	4	20	24*

* 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 weather events occurred in the country during the month. The summary contains detailed data information of 25 climate stations of Pakistan. The extremes & analysis is based on 110 numbers of stations. The information in the summary is based on real time data and/or electronic reports, therefore, the above results can be considered only preliminary. Climate Summaries are usually published in the first week of each month. Long term average for rainfall is for 1961-2010 (50 years) while normal period for temperature is 1961-1990 (30 years).

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Published on 4th October, 2021