Decadal Agromet Bulletin of Pakistan

Highlights…

- Heavy amount of rainfall reported from Punjab, Khyber Pakhtunkhwa, Sindh, Gilgit-Baltistan and Azad Jammu & Kashmir whereas light to moderate amount of rainfall reported from Baluchistan during the last decade.
- Highest amount of rainfall recorded as 329.8 mm at Sialkot during the last decade.
- Highest maximum temperature recorded as 47.0ºC at Nokundi during the last decade.
- Widespread rains/wind-thunderstorm (with isolated heavy falls) are expected in Hazara, Peshawar, Rawalpindi, Gujranwala, Lahore, Sargodha, Faisalabad, Multan, Bahawalpur divisions, Islamabad, Kashmir, while at scattered places in Malakand, Mardan, Kohat, Bannu, D.I.Khan, Zhob, Kalat, D.G.Khan, Sahiwal, Mirpurkhas divisions and Gilgit-Baltistan during the start of the current decade, whereas hot and humid weather is expected elsewhere in the country.
- Farmers of rainfed areas of upper half may complete sowing of Millet/Sorghum etc.
- After the recent rainfall spell, measures may be taken to flush out the extra water from the fields of Cotton crops and vegetables.
- Due to higher temperature worm attack is expected on Cotton crop, so farmers are advised to take adoptive measures especially the use of PB ropes in consultancy with plant protection department.

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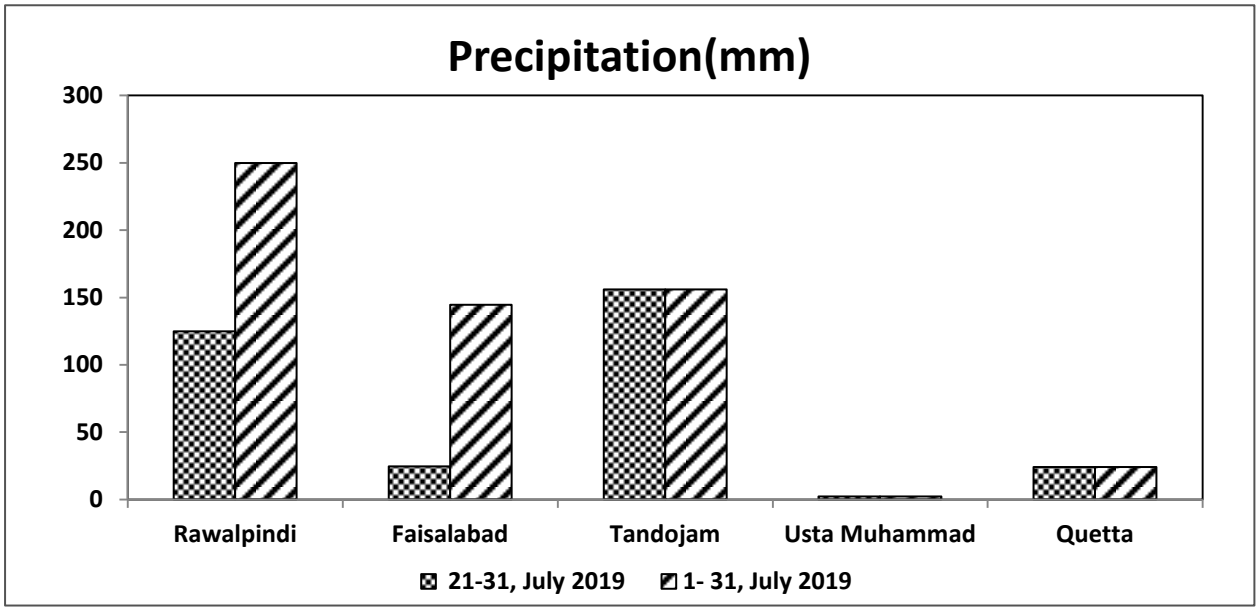
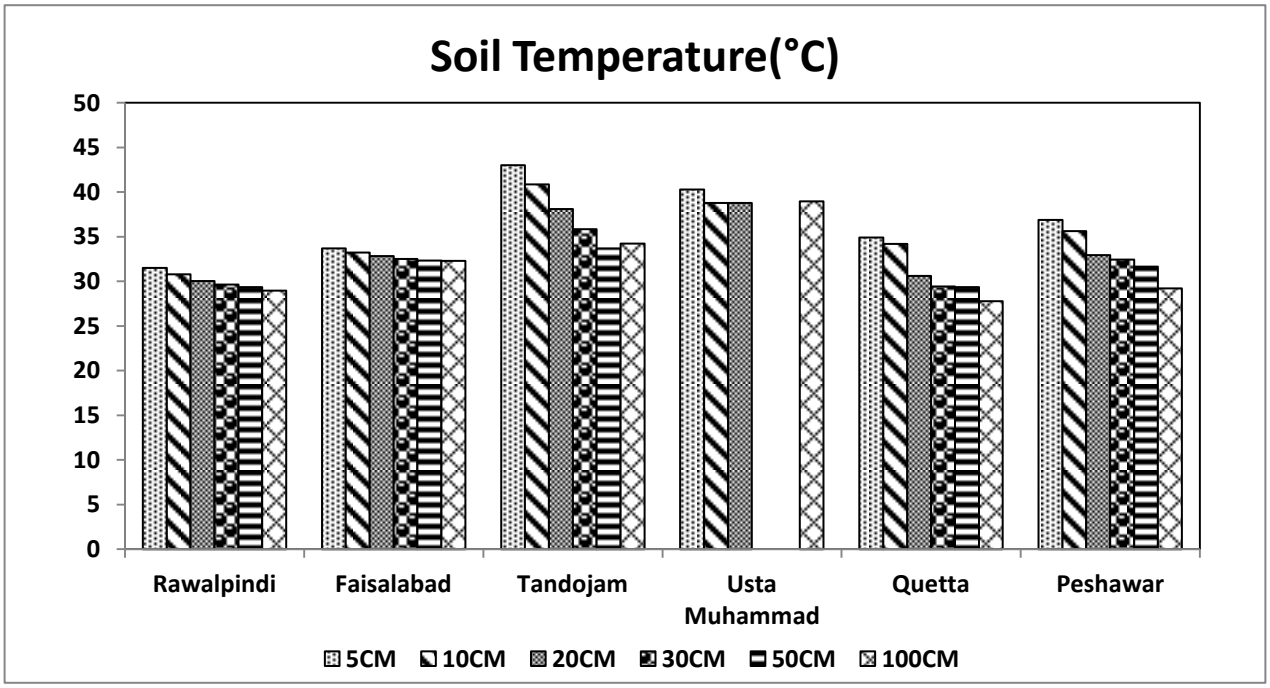
Meteorological Conditions during 3rd Decade of July, 2019

Sr. No.	Station	Precipitation (mm)			Air Temperature (°C)			Soil Temperatures (°C)						R.H (%)	Sunshine Duration(hours)	Wind Speed (km/hr)	ETo (mm/day)
		Normal	Actual	Dep	Tmx Dep	Tmin Dep	Mean	5cm	10cm	20cm	30cm	50cm	100cm				
1	Rawalpindi	13.1	124.7	111.6	0.5	2.2	30.3	31.5	30.8	30.1	29.7	29.4	29.0	64	52.9	1.6	4.1
2	Faisalabad	2.9	24.4	21.5	-0.9	0.3	31.6	33.7	33.3	32.9	32.5	32.4	32.3	67	65.6	4.8	5.1
3	Jhelum	8.3	149.1	140.8	-1.1	0.6	30.4	34.7	33.4	32.0	31.2	31.5	***	65	59.6	3.9	4.7
4	Lahore	6.5	151.9	145.4	-1.4	-0.6	30.1	32.3	32.0	31.3	30.9	***	30.0	80	44.7	2.6	3.9
5	Sargodha	5.4	24.0	18.6	-1.0	0.7	32.0	37.7	36.2	33.5	32.6	***	30.6	73	69.4	5.0	5.1
6	Multan	1.4	10.6	9.2	0.1	0.8	33.9	***	***	***	***	***	***	58	66.6	7.4	6.2
7	Khanpur	2.0	21.0	19.0	1.6	0.3	34.4	***	39.1	39.1	39.1	39.1	37.5	59	84.5	6.1	6.5
8	Tandojam	1.8	155.8	154.0	1.7	0.3	31.8	43.0	40.9	38.1	35.9	33.7	34.3	67	72.2	11.7	6.4
9	Sakrand ☆	4.2	103.0	98.8	0.9	1.1	33.2	42.7	***	***	***	***	36.5	57	84.7	8.7	6.9
11	Rohri ☆	0.3	0.0	-0.3	0.9	***	41.0	***	***	***	***	***	***	52	89.1	4.8	6.5
12	D.I Khan	3.0	56.0	53.0	0.6	1.0	32.9	***	35.1	***	34.2	23.2	***	65	70.8	10.7	6.5
13	Peshawar	4.4	24.0	19.6	2.0	0.1	32.4	36.9	35.7	33.0	32.5	31.7	29.2	62	74.1	4.4	5.4
14	Usta M.	3.5	2.0	-1.5	-0.3	4.1	35.2	40.3	38.8	38.8	***	***	39.0	58	***	4.3	5.6
15	Quetta	0.0	24.0	24.0	-1.5	0.8	28.1	34.9	34.2	30.6	29.5	29.4	27.8	38	95.2	7.0	6.5
16	Skardu	0.2	0.0	-0.2	1.2	0.0	24.5	***	***	***	***	***	***	45	65.3	2.1	4.3
17	Gilgit	0.6	3.4	2.8	0.3	3.0	28.1	***	***	***	***	***	***	50	89.9	2.7	5.2

Table-1: Meteorological parameters for selected station of Pakistan. **"Dep"** in the table stands for difference from climatic normal, i.e. actual value minus normal. And **"% Dep "**is calculated by the formula; **Dep** *divided by* **Normal** *multiplied by* **100**. Tmin & Tmax stands for minimum and maximum temperatures respectively. **ETo** stands for reference crop evapotranspiration. ******* stands for no data and (☆) indicates the station with five year's climatic (normal) data for computing departures.

Graph at RAMCs during July, 2019





Past Weather (21st to 31st July, 2019)

Heavy amount of rainfall reported from Punjab, Khyber Pakhtunkhwa, Sindh, Gilgit-Baltistan and Azad Jammu & Kashmir whereas light to moderate amount of rainfall reported from Baluchistan.

1.1 Punjab

Heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Lahore, Sialkot, & Islamabad Zero point. Decadal maximum dropped below the normal by 0.3°C & minimum raised above the normal by 0.6°C respectively in the province. Whereas values of relative humidity, sunshine hour, wind speed & ETo were recorded as 67%, 63.3 hrs, 4.5 km/hr and 5.1 mm/day respectively.

1.2 Sindh

Heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Thatta, Shaheed Bainzerabad and Tandojam. Decadal maximum & minimum both raised above the normal by 1.2°C & 0.5°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 64%, 82 hrs, 8.4 km/hr and 6.6 mm/day respectively.

1.3 Khyber Pakhtunkhwa

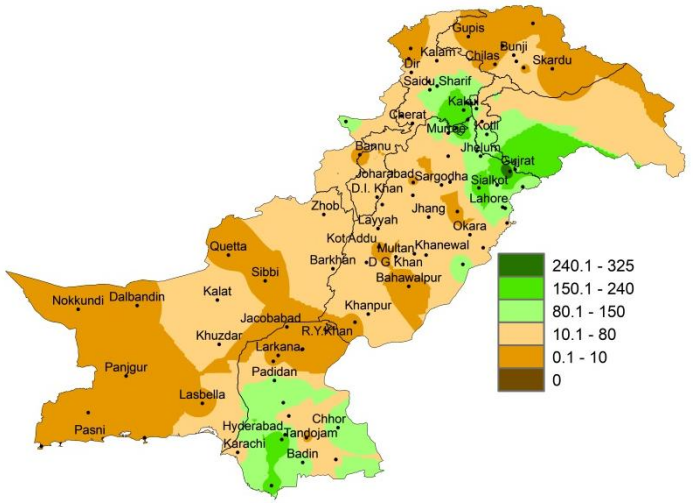
Heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Kakul, Balakot and Malam Jabba. Decadal maximum & minimum both raised above the normal by 1.3°C & 0.6°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 64%, 72.5 hrs, 7.6 km/hr and 6.0 mm/day respectively.

1.4 Baluchistan

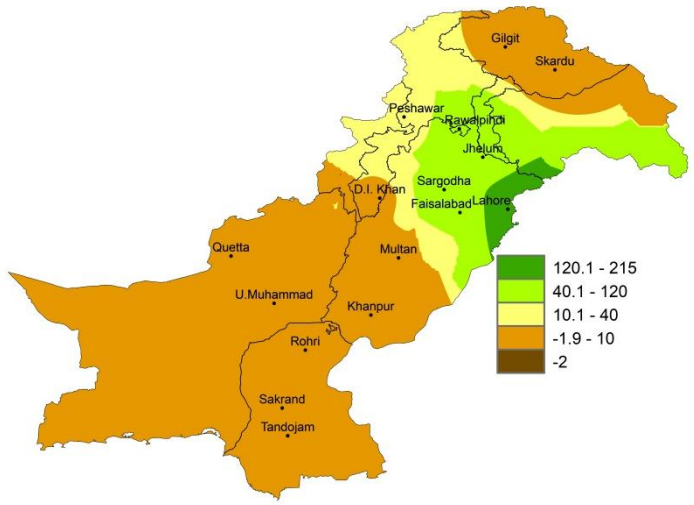
Light to moderate rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Kalat, Zhob and Barkhan. Decadal maximum dropped below the normal by 0.9°C & minimum raised above the normal by 2.5°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 48%, 95.2 hrs, 5.7 km/hr and 6.1 mm/day respectively.

1.5 Gilgit-Baltistan and Azad Jammu & Kashmir

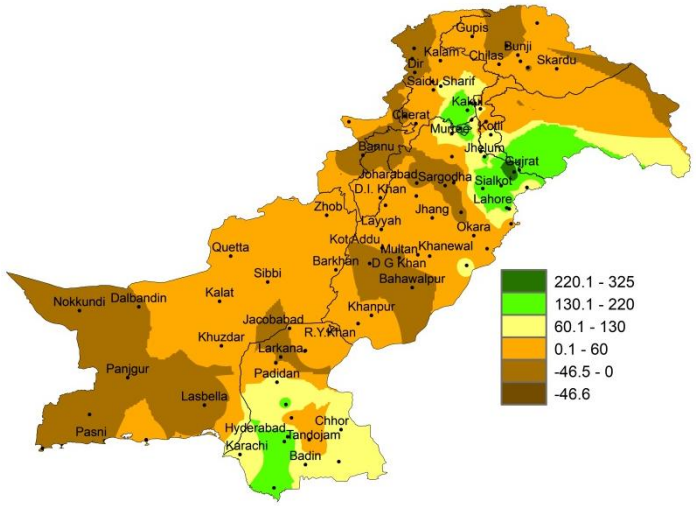
Heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Garhi Dupatta, Kotli & Muzaffarabad. Decadal maximum & minimum both raised above the normal by 0.7°C & 1.5°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 48%, 77.6 hrs, 2.4 km/hr and 4.8 mm/day respectively.



I. Actual rainfall



II. Departure of rainfall from Normal



III. Departure of rainfall from Previous Decade

Figure.1: Rainfall distribution during previous decade (mm)

2(a) Past Weather for Major Agricultural Plains (21st to 31st July, 2019)

2.1 RAMC, Rawalpindi (Potohar region)

Rainfall reported as 124.7 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 64%. Mean day temperature was 34.9°C while night temperature recorded as 25.6°C with 52.9 hours bright sunshine duration. Wind speed recorded as 1.6 km/hr with mean wind direction *Variable.*

2.2 RAMC, Faisalabad (Central Punjab)

Rainfall reported as 24.4 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 67%. Mean day temperature was 35.9°C while night temperature recorded as 27.2°C with 74.1 hours bright sunshine duration. Wind speed recorded as 4.8 km/hr with mean wind direction *south easterly*.
Cotton: V.*Good, Flowering stage completed.*

2.3 RAMC, Tandojam (Lower Sindh)

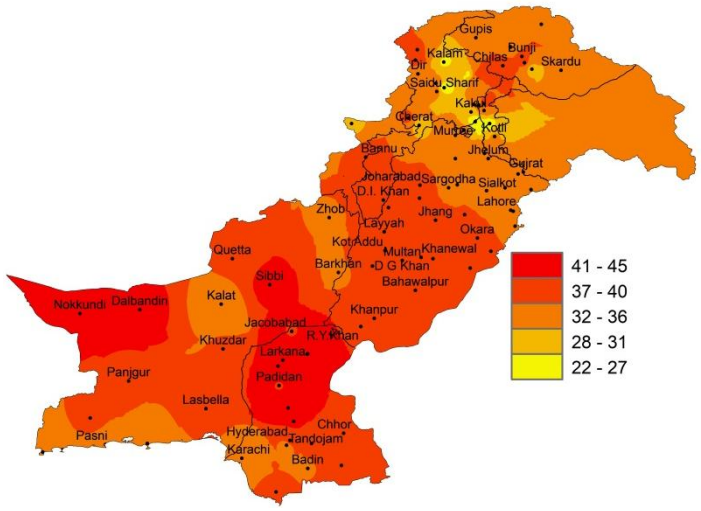
Rainfall reported as 155.8 mm during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 67%. Mean day temperature was 37.1°C while night temperature recorded as 26.5°C with 72.2 hours bright sunshine duration. Wind speed recorded as 11.7 km/h with mean wind direction *south westerly.*
Cotton (Shahbaz-95): *Good, Boll Opening.*

2.4 RAMC, Usta Muhammad (Eastern Baluchistan)

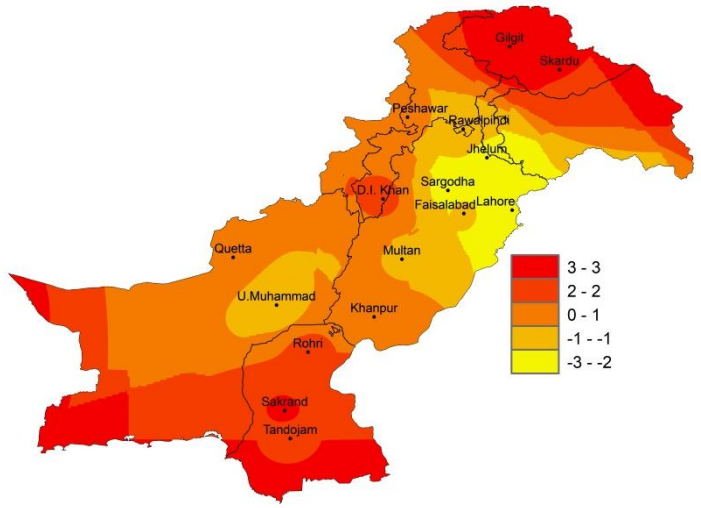
Rainfall reported as 2.0 mm during the decade; however weather remained cloudy for 07 day during the decade. Average relative humidity recorded as 58%. Mean day temperature was 40.0°C while night temperature recorded as 30.4°C & Wind speed recorded as 4.3 km/h with mean wind direction *south easterly.*
Rice: *Good, Third Leaf.*

2.5 RAMC, Quetta (Northern Baluchistan)

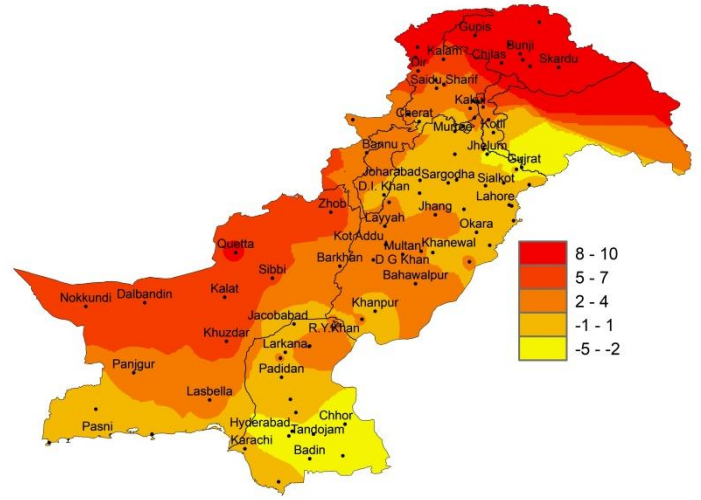
Rainfall reported as 24.0 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 38%. Mean day temperature was 34.1°C while night temperature recorded as 22.1°C with 95.2 hours bright sunshine duration. Wind speed recorded as 7.0 km/hr with mean wind direction *southerly.*



I. Actual max-temp



II. Departure of max-temp from Normal



III. Departure of max-temp from Previous Decade

Figure.2: Maximum Temperature distribution during previous decade (°C)

2(b) Past Weather for Sub-Regional Agricultural Plains (21st to 31st July, 2019)

2.6 Jhelum

Rainfall reported as 149.1 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 65%. Mean day temperature was 34.1°C while night temperature recorded as 26.7°C with 59.6 hours bright sunshine duration. Wind speed recorded as 3.9 km/hr with mean wind direction *South Westerly*.

2.7 Lahore

Rainfall reported as 151.9 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 80%. Mean day temperature was 33.6°C while night temperature recorded as 26.6°C with 44.7 hours bright sunshine duration. Wind speed recorded as 2.6 km/hr with no mean wind direction.

2.8 Sargodha

Rainfall reported as 24.0 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 73%. Mean day temperature was 36.0°C while night temperature recorded as 28.0°C with 69.4 hours bright sunshine duration. Wind speed recorded 2.7 km/hr with mean wind direction *Easterly*.

2.9 Multan

Rainfall reported as 10.6 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 58%. Mean day temperature was 38.2°C while night temperature recorded as 29.5°C with 66.6 hours bright sunshine duration. Wind speed recorded 7.4 km/hr with mean wind direction *North Easterly*.

2.10 Khanpur

Rainfall reported as 21.0 mm during the decade; however weather remained cloudy for 08 days during the decade. Average relative humidity recorded as 59%. Mean day temperature was 40.0°C while night temperature recorded as 28.8°C with 84.5 hours bright sunshine duration. Wind speed recorded 6.1 km/hr with mean wind direction *south Easterly*.

2.11 Sakrand

Rainfall reported as 103.0 mm during the decade; however weather remained cloudy for 09 days during the decade. Average humidity recorded as 57%. Mean day temperature was 38.8°C while night temperature recorded as 27.5°C with 84.7 hours bright sunshine duration. Wind speed recorded 4.7 km/hr with wind direction *southerly*.

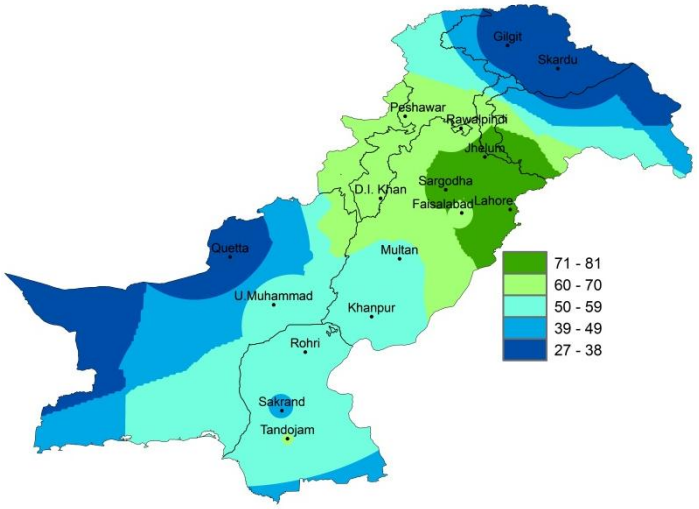


Figure.3: Relative Humidity in Percentage (%)

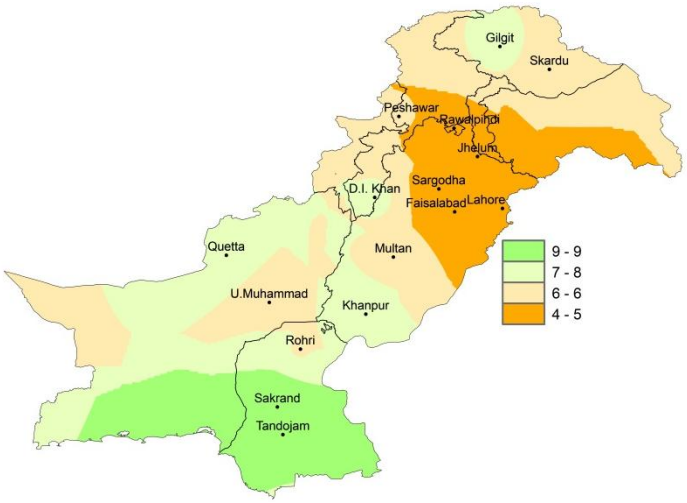


Figure.4: Reference Crop Evapotranspiration ETo (mm/day)

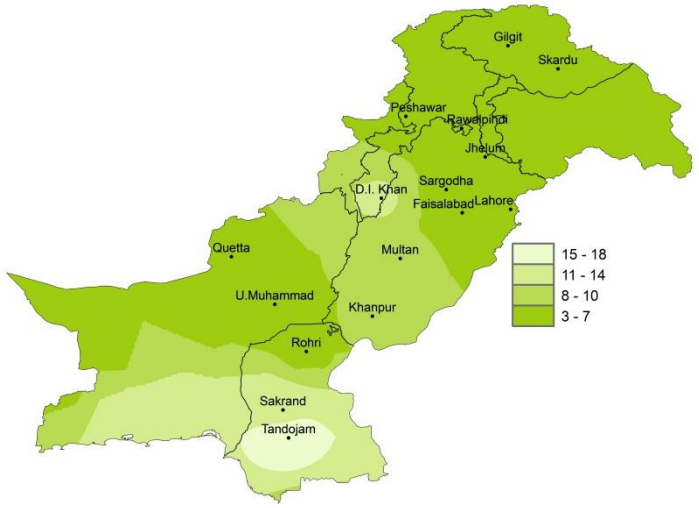


Figure 5: Wind Speed in kilometer per hour (km/h)

2.12 Rohri

Rainfall reported as Trace (Not measureable) during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 52%. Mean day temperature was 41.0°C with 89.1 hours bright sunshine duration. Wind speed recorded 4.8 km/hr with wind direction *South easterly*.

2.13 D.I. Khan

Rainfall reported as 56.0 mm during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 65%. Mean day temperature was 38.3°C while night temperature recorded as 27.4°C with 70.8 hours bright sunshine duration. Wind speed recorded as 10.7 km/hr with mean wind direction *Easterly*.

2.14 Peshawar

Rainfall reported as 24.0 mm during the decade; however weather remained cloudy for 11 days during the decade. Average relative humidity recorded as 62%. Mean day temperature was 38.1°C while night temperature recorded as 26.6°C with 74.1 hours bright sunshine duration. Wind speed recorded as 4.4 km/hr with mean wind direction *North easterly*.

2.15 Skardu

Rainfall reported as Trace (Not measureable) during the decade; however weather remained cloudy for 05 days during the decade. Average relative humidity recorded as 45%. Mean day temperature was 32.5 ºC while night temperature recorded as 16.5 ºC with 65.3 hours bright sunshine duration. Wind speed recorded as 2.1 km/hr with mean wind direction *south easterly*.

2.16 Gilgit

Rainfall reported as 3.4 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 50%. Mean day temperature was 36.0°C while night temperature recorded as 20.2°C with 89.9 hours bright sunshine duration. Wind speed recorded as 4.6 km/hr with mean wind direction *Easterly*.

Ten Days Weather Advisory for Farmers (01st to 10th July, 2019)

2.8 Temperature Forecast

Both day and night temperatures are likely to be above normal in most of the agricultural plains of the country during the decade.

2.9 Wind Forecast

Normal wind pattern may prevail in most of the agricultural plains of the country, however strong winds are expected in Baluchistan, Sindh and southern Punjab during the start of the decade.

2.10 Rain Forecast

- **Punjab:** Widespread rains/wind-thunderstorm (with isolated heavy falls) are expected at scattered places in Rawalpindi, Gujranwala, Lahore, Sargodha, Faisalabad, Multan and Bahawalpur divisions, Islamabad, while at scattered places in D.G. Khan and Sahiwal divisions during the current decade.
- **Khyber Pakhtunkhwa:** Widespread rains/wind-thunderstorm (with isolated heavy falls) are expected in Hazara and Peshawar while at scattered places in Malakand, Mardan, Kohat, Bannu and D.I.Khan divisions in the start of the current decade.
- **Sindh:** Mainly hot and humid weather is expected during the current decade.
- **Baluchistan:** Mainly hot and humid weather is expected. However, rains/wind-thunderstorm at isolated places in Zhob and Kalat divisions during the start of the current decade.
- **Gilgit-Baltistan:** Rains/wind-thunderstorm at scattered places is expected during the start of the current decade.
- **Kashmir:** Rains/wind-thunderstorm at scattered places is expected during the current decade.

2.11 Advisory for Farmers

- Farmers of rainfed areas of upper half may complete sowing of Millet/Sorghum etc.
- After the recent rainfall spell, measures may be taken to flush out the extra water from the fields of Cotton crops and vegetables.
- Due to higher temperature worm attack is expected on Cotton crop, so farmers are advised to take adoptive measures especially the use of PB ropes in consultancy with plant protection department.

4.1

Findings of AgMIP Pakistan, University of Agriculture, Faisalabad

- There would be significant increase in temperature i.e., 2.8°C in day and 2.2°C in the night during mid-century (2040-2069).
- There would be significant variability in rainfall patterns (about 25% increase in summer & 12% decrease in winter during 2040-2069).
- Climate Change will affect the crop yields negatively (about 17% for rice and 14 % for wheat).
- If there will be no adaptation to Climate Change, majority of farmers would be the economic losers.
- With Adaptation to Climate Change (through technology and management), there would be significant decrease in poverty and improvement in the livelihood of farming community.

(Agricultural Model Inter-comparison and Improvement Project (AgMIP) Pakistan 2012-2014)

1۔ سال 2040-69 کے دوران درجہ حرارت میں قابل ذکر اضافہ ہوسکتا ہے۔ جو کہ دن کے وقت 2.8°c اور رات کو 2.2°c تک ہوگا۔

2۔ گرمیوں کی بارش میں 25 فیصد اضافہ اور سردیوں کی بارش میں 12 فیصد تک کمی کا امکان ہے۔

3۔ مندرجہ بالا موسمی تغیرات کی وجہ سے دھان کی پیداوار میں 17 فیصد اور گندم کی پیداوار میں 14 فیصد تک کمی ہوسکتی ہے۔

4۔ اگر موسمی تغیرات کا مناسب بندوبست نہ کیا گیا۔ تو کسانوں کی اکثریت کو معاشی نقصان کا سامنا کرنا پڑے گا۔

5۔ موسمی تغیرات کے سدِّ باب (بذریعہ نئی ٹیکنالوجی کا استعمال اور بہتر نظم ونسق) سے غربت میں کمی اور کسانوں کی زندگی میں خوشحالی لائی جاسکتی ہے۔

(ایگمپ پاکستان 2012-2014)