Decadal Agromet Bulletin of Pakistan

Highlights…

❖ Moderate to heavy amount of rainfall reported from Punjab. Light to moderate rainfall reported from Khyber Pakhtunkhwa, Gilgit-Baltistan, Azad Jammu & Kashmir while dry weather reported from Baluchistan and Sindh.

❖ Highest amount of rainfall recorded as 137.4 mm at Chaklala Airbase during the last decade.

❖ Highest maximum temperature recorded as 45ºC at Lasbela during the last decade.

❖ Mainly hot and humid weather is expected in most parts of the country. However, rain/wind-thunderstorm (with isolated heavy falls) is expected at scattered places in Khyber Pakhtunkhwa, Punjab, Gilgit Baltistan, Kashmir and at isolated places in Balochistan and Sindh during the 1ˢᵗ half of the current decade.

❖ Farmers are advised to schedule the picking of cotton after 10am in the morning to get the maximum yield.

❖ Farmers are advised to schedule the irrigation plans in accordance with the expected weather, mentioned during the decade.

❖ Removing weeds from the standing crops is very important as weeds utilize moisture and food which are to be utilized by the crop. As a result considerable loss in yield occurs every year.

NATIONAL AGROMET CENTRE (NAMC)
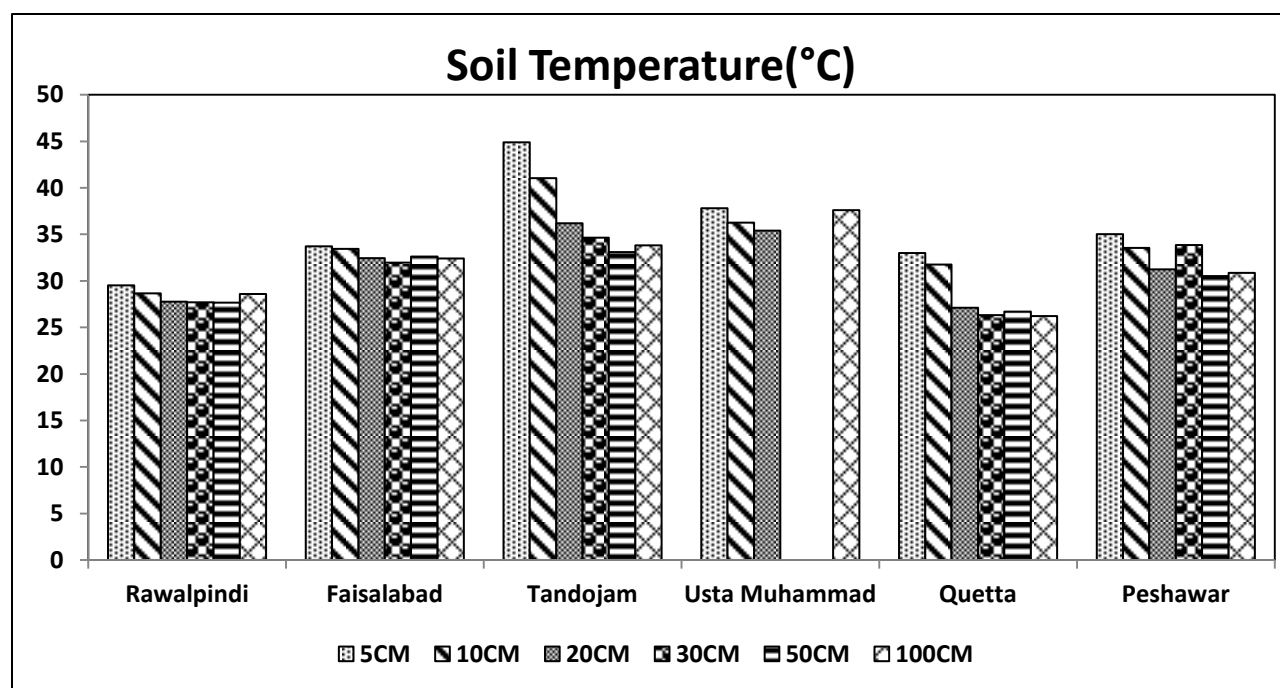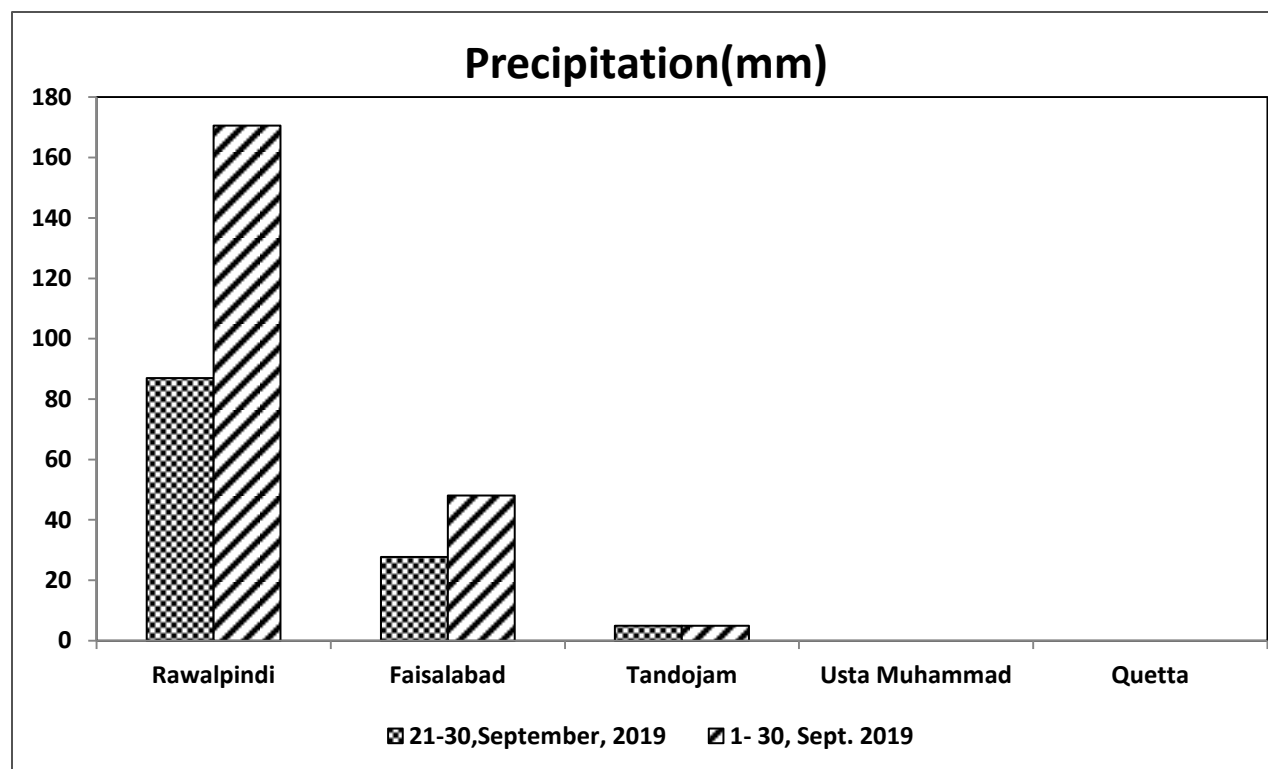### PAKISTAN METEOROLOGICAL DEPARTMENT
SECTOR H-8/2, ISLAMABAD

Meteorological Conditions during 3ʳᵈ Decade of September, 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	1.9	87.0	85.1	-1.9	3.4	26.8	29.5	28.7	27.8	27.7	27.7	28.6	77	65.7	0.9	3.1
2	Faisalabad	2.1	27.7	25.6	-0.9	3.0	29.8	33.7	33.5	32.5	32.0	32.6	32.4	65	56.4	2.3	3.4
3	Jhelum	0.9	42.0	41.1	-2.5	-3.5	25.5	30.4	29.3	27.3	28.8	29.4	***	74	60.4	2.7	3.2
4	Lahore	1.1	63.2	62.1	-1.4	0.8	29.2	31.5	31.4	30.5	30.1	***	30.5	71	48.0	1.9	3.1
5	Sargodha	0.9	43.3	42.4	-1.5	1.7	29.7	34.9	33.4	31.5	31.1	***	30.2	68	59.8	3.0	3.5
6	Multan	0.1	9.0	8.9	-1.2	2.5	31.0	***	***	***	***	***	***	57	83.5	5.6	5.0
7	Khanpur	0.0	0.0	0.0	0.4	2.9	31.6	***	36.0	36.1	36.3	36.5	35.9	52	91.5	2.4	4.6
8	Tandojam	0.0	5.0	5.0	0.7	2.1	31.3	44.9	41.1	36.2	34.7	33.1	33.8	66	83.8	4.0	4.8
9	Sakrand ☆	0.0	2.0	2.0	1.1	2.5	31.6	44.7	***	***	***	***	35.6	55	99.8	4.1	5.3
11	Rohri ☆	0.0	0.0	0.0	0.2	***	38.1	***	***	***	***	***	***	54	99.2	5.1	5.4
12	D.I Khan	0.7	0.0	-0.7	-3.3	2.1	28.5	***	32.8	***	33.0	22.7	***	61	78.0	7.5	4.1
13	Peshawar	1.1	1.2	0.1	1.0	2.1	29.1	35.0	33.6	31.3	33.9	30.5	30.9	64	55.2	2.7	3.3
14	Usta M.	0.0	0.0	0.0	-1.6	1.8	32.6	37.8	36.3	35.4	***	***	37.6	61	***	2.1	3.9
15	Quetta	0.0	0.0	0.0	2.0	8.2	24.6	33.0	31.8	27.1	26.3	26.7	26.2	35	109.6	6.1	5.3
16	Skardu	0.1	0.0	-0.1	5.6	0.7	19.0	***	***	***	***	***	***	39	53.5	3.1	3.2
17	Gilgit	0.2	0.0	-0.2	5.0	4.3	23.8	***	***	***	***	***	***	48	92.0	0.5	3.0

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 September, 2019

Precipitation(mm)

Legend: ⊠ 21-30,September, 2019   ⊡ 1- 30, Sept. 2019

Categories: Rawalpindi, Faisalabad, Tandojam, Usta Muhammad, Quetta

Soil Temperature(°C)

Legend: ⊞ 5CM   ◩ 10CM   ▦ 20CM   ⬕ 30CM   ⊟ 50CM   ▨ 100CM

Categories: Rawalpindi, Faisalabad, Tandojam, Usta Muhammad, Quetta, Peshawar

Past Weather (21st to 30th September, 2019)

Moderate to heavy amount of rainfall reported from Punjab. Light to moderate rainfall reported from Khyber Pakhtunkhwa, Gilgit-Baltistan, Azad Jammu & Kashmir while dry weather reported from Baluchistan and Sindh.

1.1 Punjab

Moderate to heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Sialkot Cantt, Golra & Chaklala Airbase. Decadal maximum dropped below the normal by 1.3°C & minimum raised above the normal by 1.5°C respectively in the province. Whereas values of relative humidity, sunshine hour, wind speed & ETo were recorded as 66%, 66.5 hrs, 2.7 km/hr and 3.7 mm/day respectively.

1.2 Sindh

Dry weather reported from most of the agricultural plains of the province. Highest rainfall reported from Faisal base, Chhor & North Karachi. Decadal maximum & minimum both raised above the normal by 0.7°C & 1.2°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 58%, 94.3 hrs, 4.4 km/hr 5.2 mm/day respectively.

1.3 Khyber Pakhtunkhwa

Light to moderate amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Pattan, Kakul & Risalpur. Decadal maximum dropped below the normal by 1.2°C & minimum raised above the normal by 2.1°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 63%, 66.3 hrs, 5.1 km/hr and 3.7 mm/day respectively.

1.4 Baluchistan

Dry weather reported from most of the agricultural plains of the province. Highest rainfall reported from Lasbela, Turbat & Barkhan. Decadal maximum & minimum both raised above the normal by 0.2°C & 5.0°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 48%, 109.6 hrs, 4.1 km/hr and 4.6 mm/day respectively.

1.5 Gilgit-Baltistan and Azad Jammu & Kashmir

Moderate to heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Kotli, Muzaffarabad Air Port & Garhi Dupatta. Decadal maximum & minimum both raised above the normal by 5.3°C & 2.5°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 44%, 72.8 hrs, 1.8 km/hr and 3.1 mm/day respective.
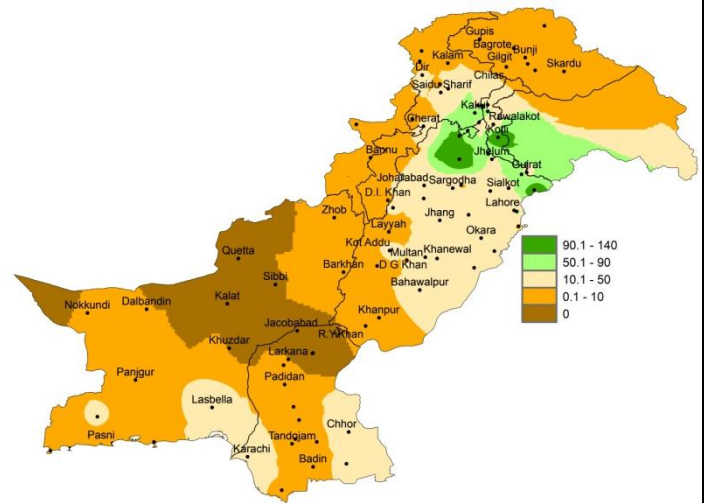
I.   Actual rainfall
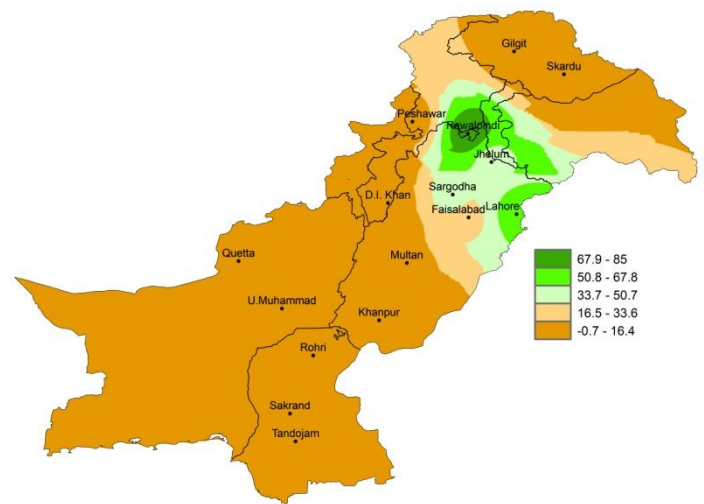
II.   Departure of rainfall from Normal
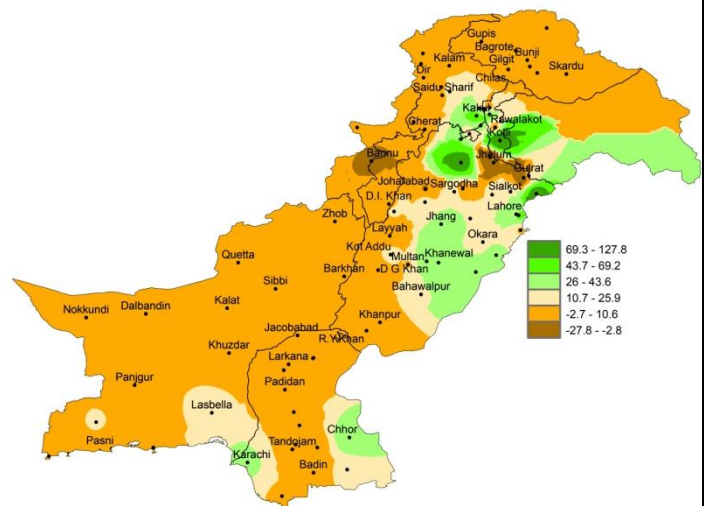
III.   Departure of rainfall from Previous Decade

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

2(a)   Past Weather for Major Agricultural Plains (21ˢᵗ to 30ᵗʰ September, 2019)

2.1   RAMC, Rawalpindi (Potohar region)

Rainfall reported as 87.0 mm during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 77%. Mean day temperature was 31.0°C while night temperature recorded as 22.6°C with 65.6 hours bright sunshine duration. Wind speed recorded as 0.9 km/hr with mean wind direction *Variable*.

2.2   RAMC, Faisalabad (Central Punjab)

Rainfall reported as 27.7 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 65%. Mean day temperature was 34.5°C while night temperature recorded as 25.1°C with 56.4 hours bright sunshine duration. Wind speed recorded as 2.3km/hr with mean wind direction *North easterly*.
Cotton: *V. Good, Maturity stage.*

2.3   RAMC, Tandojam (Lower Sindh)

Rainfall reported as 5.0 mm during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 58%. Mean day temperature was 37.1°C while night temperature recorded as 25.4°C with 83.8 hours bright sunshine duration. Wind speed recorded as 4.0 km/h with mean wind direction *south westerly*.
**Cotton (Shahbaz-95):** *Good condition, Boll Opening stage.*

2.4   RAMC, Usta Muhammad (Eastern Baluchistan)

Dry weather reported during the decade; however weather remained cloudy for 03 day during the decade. Average relative humidity recorded as 61%. Mean day temperature was 37.8°C while night temperature recorded as 27.3°C & Wind speed recorded as 2.1km/h with mean wind direction *south easterly*.
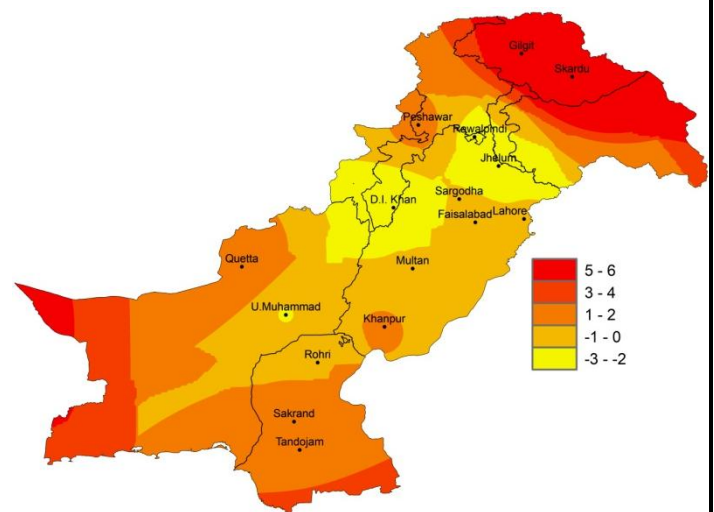**Rice:** *Good, Milk maturity stage.*

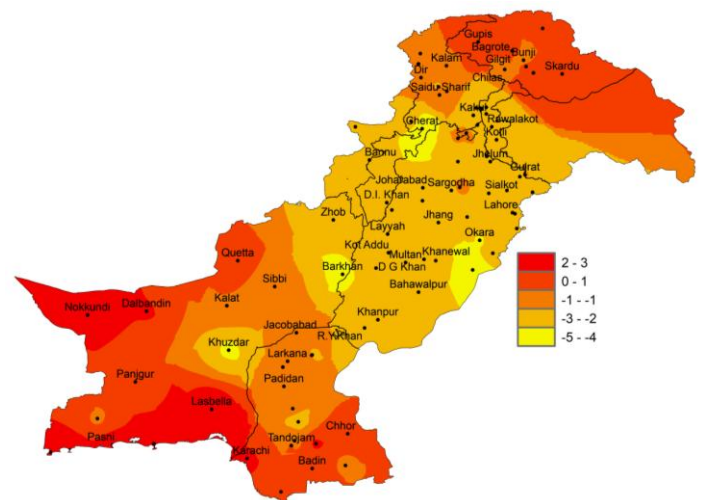### 2.5   RAMC, Quetta (Northern Baluchistan)

Dry weather reported during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 35%. Mean day temperature was 27.0°C while night temperature recorded as 17.5°C with 109.6 hours bright sunshine duration. Wind speed recorded as 6.1 km/hr with mean wind direction *Southerly*.
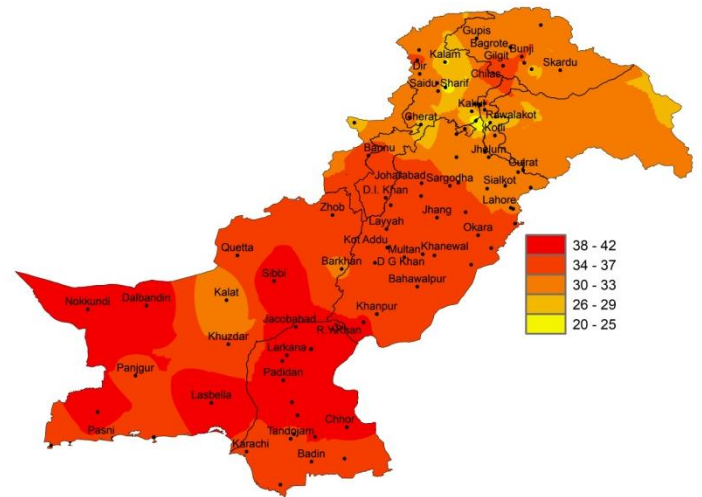
I.   Actual max-temp

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 30th September, 2019)

2.6　Jhelum

Rainfall reported as 42.0 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 74%. Mean day temperature was 32.1°C while night temperature recorded as 18.8°C with 60.4 hours bright sunshine duration. Wind speed recorded as 2.7 km/hr with mean wind direction *south westerly*.

2.7　Lahore

Rainfall reported as 63.2 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 71%. Mean day temperature was 33.0°C while night temperature recorded as 25.4°C with 78.0 hours bright sunshine duration. Wind speed recorded as 1.9km/hr with mean wind direction *North easterly*.

2.8　Sargodha

Rainfall reported as 43.3 mm during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 68%. Mean day temperature was 34.0°C while night temperature recorded as 25.3°C with 59.8 hours bright sunshine duration. Wind speed recorded 1.6 km/hr with mean wind direction *Easterly*.

2.9　Multan

Rainfall reported as 9.0 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 57%. Mean day temperature was 35.3°C while night temperature recorded as 26.7°C with 83.5 hours bright sunshine duration. Wind speed recorded 5.6 km/hr with mean wind direction *North easterly*.

2.10　Khanpur

Rainfall reported as Trace (Not measurable) during the decade; however weather remained cloudy for 03 day during the decade. Average relative humidity recorded as 52%. Mean day temperature was 37.0°C while night temperature recorded as 26.1°C with 91.5 hours bright sunshine duration. Wind speed recorded 2.4 km/hr with mean wind direction *North easterly*.

2.11　Sakrand

Rainfall reported 2.0 mm during the decade; however weather remained cloudy for 06 days during the decade. Average humidity recorded as 55%. Mean day temperature was 38.1°C while night temperature recorded as 25.0°C with 99.8 hours bright sunshine duration. Wind speed recorded 2.2 km/hr with wind direction *southerly*.
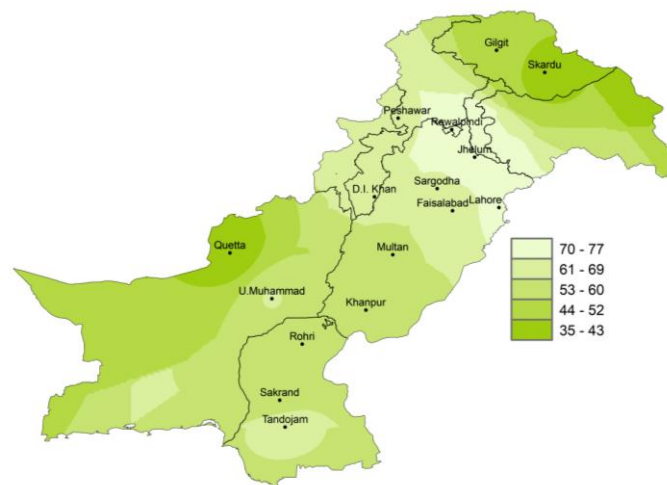

Figure.3: Relative Humidity in Percentage (%)

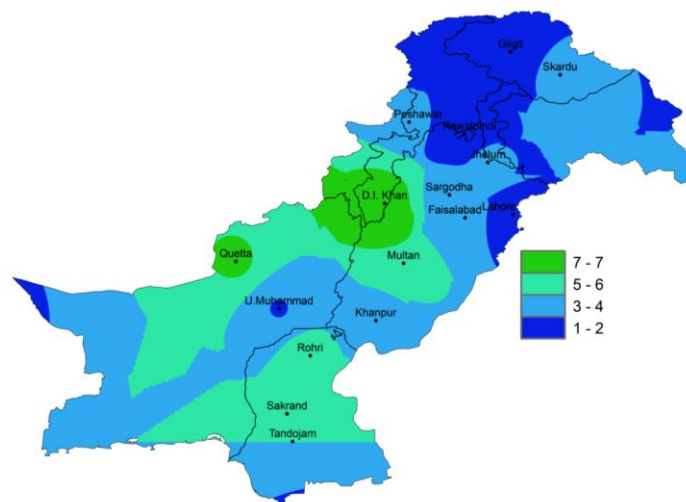*Figure.4: Reference Crop Evapotranspiration ETo (mm/day)*

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

2.12   Rohri

Dry weather reported during the decade; however weather remained cloudy for 02 day during the decade. Average relative humidity recorded as 54%. Mean day temperature was 38.1°C, with 99.2 hours bright sunshine duration. Wind speed recorded 5.1 km/hr with wind direction *south easterly.*

2.13   D.I. Khan

Dry weather reported as during the last decade; however weather remained cloudy for 06 day during the decade. Average relative humidity recorded as 61%. Mean day temperature was 32.6°C while night temperature recorded as 24.3°C with 78.0 hours bright sunshine duration. Wind speed recorded as 7.5 km/hr with mean wind direction *south easterly.*

2.14   Peshawar

Rainfall reported 1.2 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 64%. Mean day temperature was 34.7 °C while night temperature recorded as 23.4 °C with 55.2 hours bright sunshine duration. Wind speed recorded as 2.7 km/hr with mean wind direction *north easterly.*

2.15   Skardu

Dry weather reported as during the last decade however weather remained cloudy for 02 days during the decade. Average relative humidity recorded as 39%. Mean day temperature was 29.3°C while night temperature recorded as 8.7 °C with 53.5 hours bright sunshine duration. Wind speed recorded as 3.1 km/hr with mean wind direction *East-north-easterly.*

2.16   Gilgit

Rainfall reported as Trace (Not measurable) during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 48%. Mean day temperature was 34.5°C while night temperature recorded as 13.0°C with 92.0 hours bright sunshine duration. Wind speed recorded as 1.5 km/hr with mean wind direction *South easterly.*

Ten Days Weather Advisory for Farmers (1st to 10th October, 2019)

3.1   Temperature Forecast
Day time temperatures are likely to be below normal whereas night time temperatures are likely to be slightly above normal in most of the agricultural plains of the country during the decade.

3.2   Wind Forecast
Generally, normal wind pattern may prevail in most of the agricultural plains of the country.

3.3   Rain Forecast

❖   **Punjab:**   Rain/wind-thunderstorm   is   expected   at scattered places in all districts of south Punjab (D.G. Khan, Multan, Bahawalpur, Rajanpur, Rahim yar khan, Muzaffargarh), while at isolated places in districts of upper/central Punjab (Rawalpindi, Gujranwala, Sialkot, Narowal, Gujrat, Sargodha, Attock, Chakwal) during the 1st half of the current decade.
❖   **Khyber Pakhtunkhwa:** Rain/wind-thunderstorm is expected at scattered places in Mansehra, Haripur, Abbottabad, Sawt, Dir, Swabi, Charsadda, Noshera, Peshawar, Mardan, Kohat, Parachinar, Bannu and D.I.Khan district during the 1st half of the current decade.
❖   **Sindh:** Mainly hot and humid weather is expected in most of the province. However, rain/wind-thunderstorm is expected at scattered places in Sukkur, Larkana, Sanghar, Shaheed Benazirabad, Khairpur, Hyderabad, Mirpur Khas, Shikaarpur, Ghotki and Jacobabad districts during the 1st half of current decade.
❖   **Baluchistan:** Mainly hot and humid weather is expected in most parts of the province. However, rain/wind-thunderstorm is expected at scattered places in Kech, Turbat, Panjgur, Lasbella, Kalat, Zhob and Barkhan districts during the 1st half of the current decade.
❖   **Gilgit-Baltistan:** Rain/wind-thunderstorm (with isolated heavy falls) is expected at isolated places in the province in the evening/night during the current decade.
❖   **Kashmir:** Rain/wind-thunderstorm (with isolated heavy falls) is expected at isolated places in the province in the evening/night during the current decade.

3.4   Advisory for Farmers

❖   Farmers are advised to schedule the picking of cotton after 10am in the morning to get the maximum yield.
❖   Farmers are advised to schedule the irrigation plans in accordance with the expected weather, mentioned during the decade.
❖   Removing weeds from the standing crops is very important as weeds utilize moisture and food which are to be utilized by the crop. As a result considerable loss in yield occurs every year.

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)

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

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

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

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

۵۔ موسمی تغیرات کے سدِّ باب (بذریعہ نئی ٹیکنالوجی کا استعمال اور بہتر نظم و نسق) سے غربت میں کمی اور کسانوں کی زندگی میں خوشحالی لائی جا سکتی ہے۔

(ایگمپ پاکستان 2012-2014)