Decadal Agromet Bulletin of Pakistan

Highlights…

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

❖ Highest amount of rainfall recorded as 117.0 mm at Mandi Bahauddin during the last decade.

❖ Highest maximum temperature recorded as 46.5 ºC at Turbat during the last decade.

❖ Mainly hot and humid weather is expected in most parts of the country. However, rain/wind-thunderstorm is expected at isolated places in Malakand, Hazara, Mardan, Rawalpindi, Gujranwala, Lahore divisions, Islamabad, Gilgit Baltistan and Kashmir for few days during the 1st half of the current decade.

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

❖ Adopt better practices for weed management of Cotton crop as it is in critical weed period. Plant protection measures for worm may be initiated. Accordingly farmers are advised to take adoptive measures especially use of PB ropes in consultancy with plant protection department.

❖ Cotton picking may be initiated after 10 am in the morning as there will be dew present on cotton plants during early morning.

Meteorological Conditions during 1ˢᵗ 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	5.4	22.0	16.6	1.6	7.1	32.1	32.4	31.5	29.9	29.7	29.3	29.4	67	87.7	0.6	4.4
2	Faisalabad	1.6	5.4	3.8	3.0	3.3	33.0	37.0	36.2	34.8	33.9	33.5	32.7	60	75.2	3.0	4.7
3	Jhelum	3.4	50.9	47.5	2.1	2.0	31.5	34.4	33.6	32.2	31.4	31.7	***	68	76.2	3.5	4.6
4	Lahore	3.8	47.3	43.5	2.1	1.2	31.8	32.9	32.8	32.2	31.9	***	30.5	71	64.8	2.0	5.2
5	Sargodha	1.5	18.4	16.9	2.3	2.5	33.3	39.4	37.2	34.4	33.3	***	30.9	64	86.2	3.9	4.9
6	Multan	3.8	0.3	-3.5	2.3	4.1	34.7	***	***	***	***	***	***	55	78.0	7.0	6.0
7	Khanpur	0.7	0.0	-0.7	3.1	2.4	34.1	***	37.5	37.3	37.7	37.2	36.1	61	95.9	3.8	5.7
8	Tandojam	2.2	0.0	-2.2	1.8	2.5	32.2	44.6	40.1	36.6	34.4	32.8	33.6	74	77.7	5.5	5.1
9	Sakrand ☆	1.0	45.0	44.0	1.0	-0.5	30.8	41.4	***	***	***	***	35.7	58	97.1	4.4	5.6
11	Rohri ☆	0.1	0.0	-0.1	2.2	***	40.2	***	***	***	***	***	***	53	103.6	3.1	5.7
12	D.I Khan	1.1	0.0	-1.1	3.8	0.8	32.6	***	34.7	***	33.7	22.8	***	61	75.2	10.2	7.5
13	Peshawar	1.1	0.0	-1.1	2.0	1.1	31.4	35.2	33.9	31.8	31.0	30.7	30.7	60	61.1	3.6	4.3
14	Usta M.	0.6	0.0	-0.6	0.6	1.7	33.9	39.5	37.3	36.4	***	***	37.6	61	***	3.9	5.0
15	Quetta	0.0	0.0	0.0	0.4	4.1	25.5	35.2	34.1	29.2	28.4	28.5	27.5	24	110.4	5.2	5.7
16	Skardu	0.8	0.0	-0.8	7.5	1.1	21.6	***	***	***	***	***	***	47	35.4	0.8	2.7
17	Gilgit	0.5	0.0	-0.5	3.0	5.1	26.1	***	***	***	***	***	***	48	87.5	1.3	4.0

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)

☒ 1-10,September, 2019   ☐ 1- 31, August, 2019

Soil Temperature(°C)

▨ 5CM   ☐ 10CM   ▨ 20CM   ▨ 30CM   ▤ 50CM   ▨ 100CM
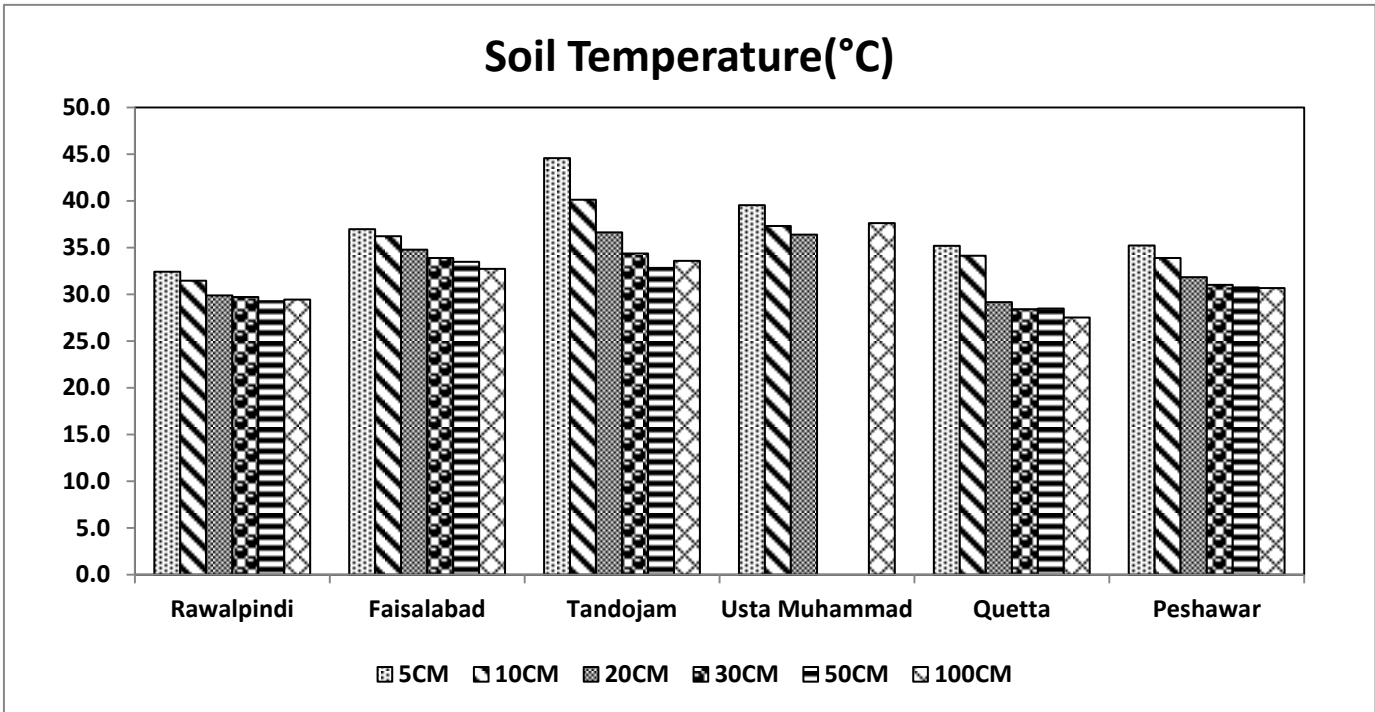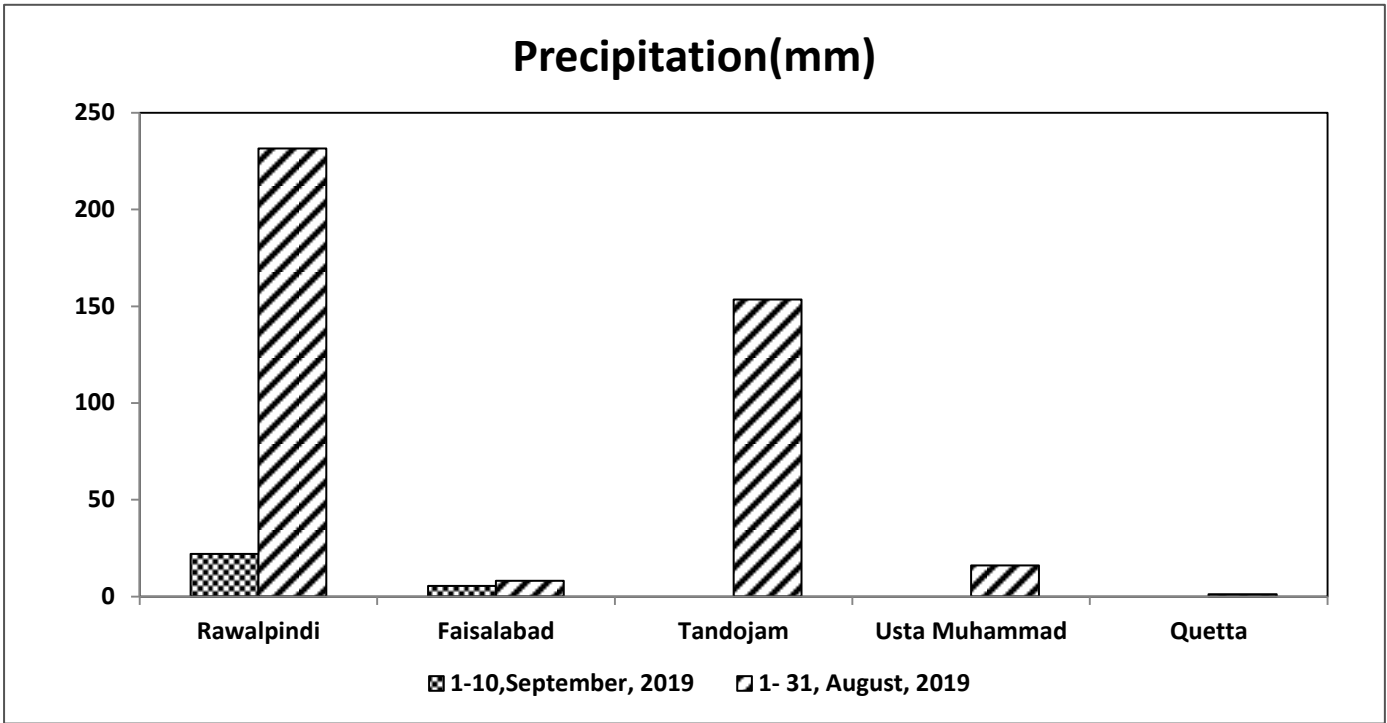
Past Weather (1st to 10th September, 2019)

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

1.1   Punjab

Moderate to heavy amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Mandi Bahauddin, Narowal & Jhelum. Decadal maximum & minimum both raised above the normal by 2.4°C & 3.2°C respectively in the province. Whereas values of relative humidity, sunshine hour, wind speed & ETo were recorded as 64%, 80.6 hrs, 3.4 km/hr and 5.1 mm/day respectively.

1.2   Sindh

Light to Moderate amount of rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Mithi, Shahed Bainazerabad & Sakrand. Decadal maximum & minimum both raised above the normal by 1.7°C & 1.2°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 62%, 92.8 hrs, 4.3 km/hr 5.5 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, Dir & Kohat Airbase. Decadal maximum & minimum both raised above the normal by 2.9°C & 0.9°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 61%, 68.2 hrs, 6.9 km/hr and 5.9 mm/day respectively.

1.4   Baluchistan

Light rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from, Khuzdar, Lasbela & Barkhan Decadal maximum & minimum both raised above the normal by 0.5°C & 2.9°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 43%, 110.4 hrs 4.0 km/hr and 5.4 mm/day respectively.

### 1.5   Gilgit-Baltistan and Azad Jammu & Kashmir

Light rainfall reported from most of the agricultural plains of the province. Highest rainfall reported from Kotli, Garhi Dupatta & Bagrote. Decadal maximum & minimum both raised above the normal by 5.3°C & 3.1°C respectively in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 48%, 61.5 hrs, 1.1 km/hr and 3.4 mm/day respective.
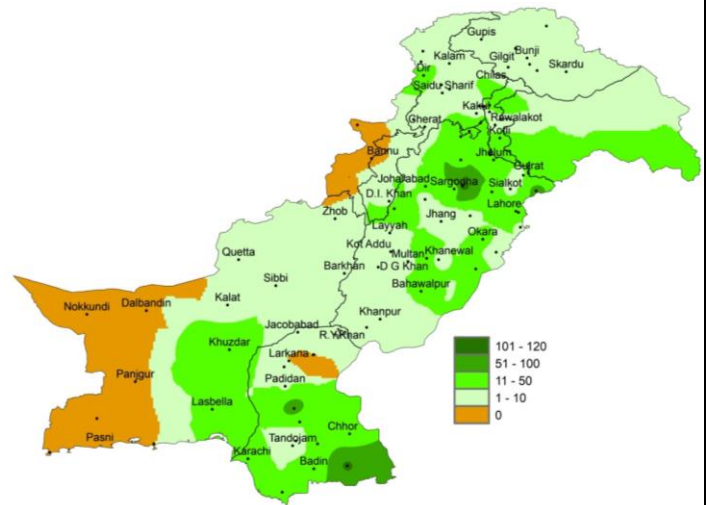
I.   Actual rainfall
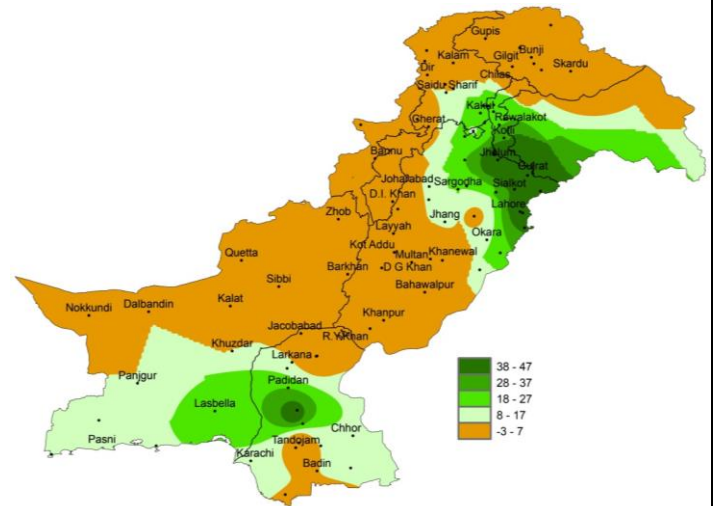
II.   Departure of rainfall from Normal
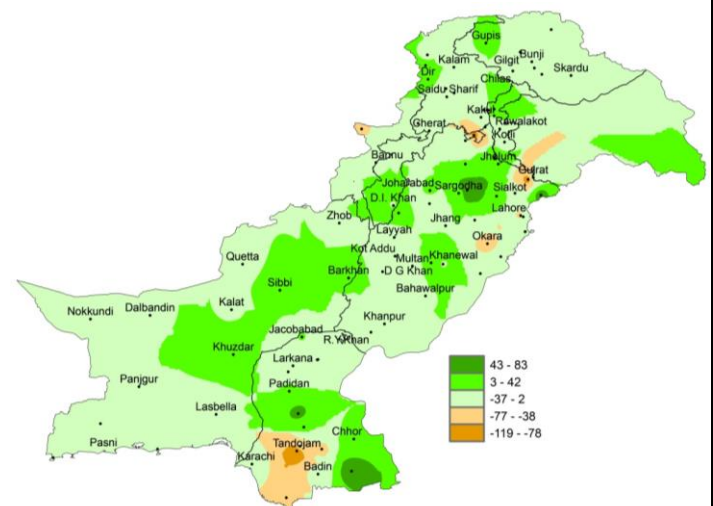
III.   Departure of rainfall from Previous Decade

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

2(a)   Past Weather for Major Agricultural Plains (1st to 10th September, 2019)

2.1   RAMC, Rawalpindi (Potohar region)

Rainfall reported as 22.0 mm during the decade; however weather remained cloudy for 06 days during the decade. Average relative humidity recorded as 67%. Mean day temperature was 35.0°C while night temperature recorded as 29.7°C with 86.7 hours bright sunshine duration. Wind speed recorded as 0.6 km/hr with mean wind direction *north westerly*.

2.2   RAMC, Faisalabad (Central Punjab)

Rainfall reported as 5.4 mm during the decade; however weather remained cloudy for 08 days during the decade. Average relative humidity recorded as 60%. Mean day temperature was 38.7°C while night temperature recorded as 27.3°C with 75.2 hours bright sunshine duration. Wind speed recorded as 3.0 km/hr with mean wind direction *south easterly*.

Cotton: V. Good, Boll Opening stage completed.

2.3   RAMC, Tandojam (Lower Sindh)

Dry weather reported during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 74%. Mean day temperature was 37.3°C while night temperature recorded as 27.1°C with 77.7 hours bright sunshine duration. Wind speed recorded as 5.5 km/h with mean wind direction *southerly*.

Cotton (Shahbaz-95): Not good condition due to rain, Boll Opening stage.
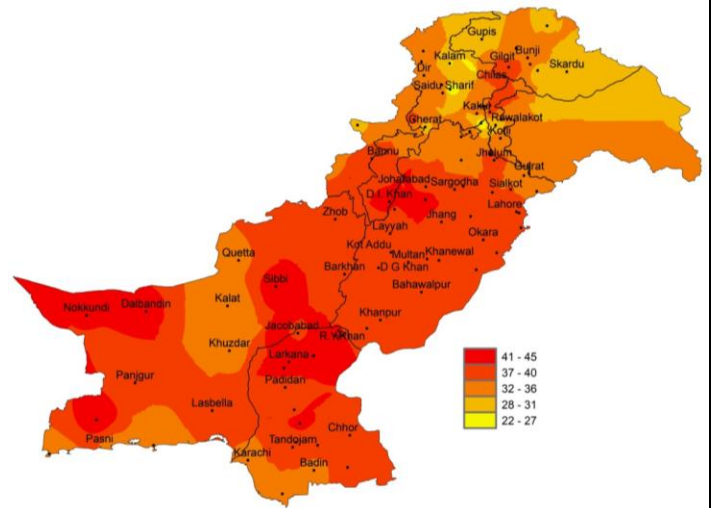
2.4   RAMC, Usta Muhammad (Eastern Baluchistan)

Dry weather reported during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 61%. Mean day temperature was 39.4°C while night temperature recorded as 28.3°C & Wind speed recorded as 3.9 km/h with mean wind direction *south easterly*.

Rice: Good, Third Leaf stage.
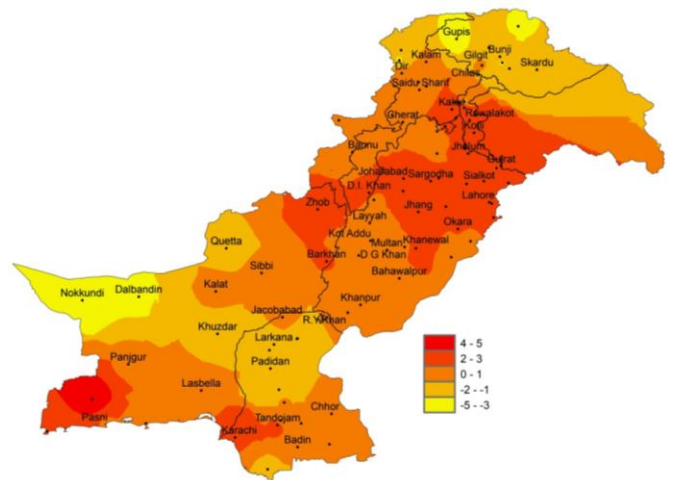
2.5   RAMC, Quetta (Northern Baluchistan)

Dry weather reported during the decade; however weather remained cloudy for 06 days during the decade. Average relative humidity recorded as 24%. Mean day temperature was 34.4°C while night temperature recorded as 17.8°C with 110.4 hours bright sunshine duration. Wind speed recorded as 5.2 km/hr with mean wind direction *north westerly*.

I.   Actual max-temp
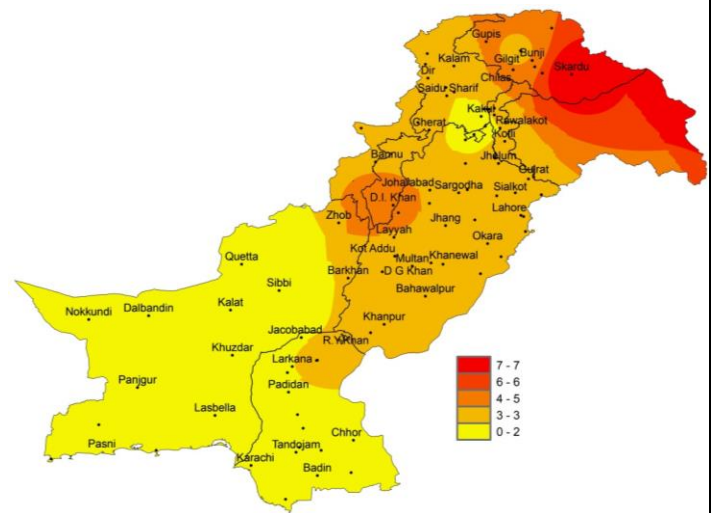
II.   Departure of max-temp from Normal

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 (1st to 10th September, 2019)**

2.6　Jhelum

Rainfall reported as 50.9 mm during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 68%. Mean day temperature was 36.6°C while night temperature recorded as 26.4°C with 76.2 hours bright sunshine duration. Wind speed recorded as 3.5 km/hr with mean wind direction *south westerly*.

2.7　Lahore

Rainfall reported as 47.3 mm during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 71%. Mean day temperature was 36.3°C while night temperature recorded as 27.2°C with 64.8 hours bright sunshine duration. Wind speed recorded as 2.0 km/hr with mean wind direction *north westerly*.

2.8　Sargodha

Rainfall reported as 18.4 mm during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 64%. Mean day temperature was 38.4°C while night temperature recorded as 28.2°C with 86.2 hours bright sunshine duration. Wind speed recorded 2.1 km/hr with mean wind direction *Easterly*.

2.9　Multan

Rainfall reported as 0.3 mm during the decade; however weather remained cloudy for 09 days during the decade. Average relative humidity recorded as 55%. Mean day temperature was 38.9°C while night temperature recorded as 30.4°C with 78.0 hours bright sunshine duration. Wind speed recorded 7.0 km/hr with mean wind direction *southerly*.

2.10　Khanpur

Dry weather reported during the decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 61%. Mean day temperature was 39.8°C while night temperature recorded as 28.4°C with 95.9 hours bright sunshine duration. Wind speed recorded 3.8 km/hr with mean wind direction *south westerly*.

2.11　Sakrand

Rainfall reported as 45.0 mm during the decade; however weather remained cloudy for 10 days during the decade. Average humidity recorded as 58%. Mean day temperature was 37.4°C while night temperature recorded as 24.4°C with 97.1 hours bright sunshine duration. Wind speed recorded 4.4 km/hr with wind direction *southerly*.
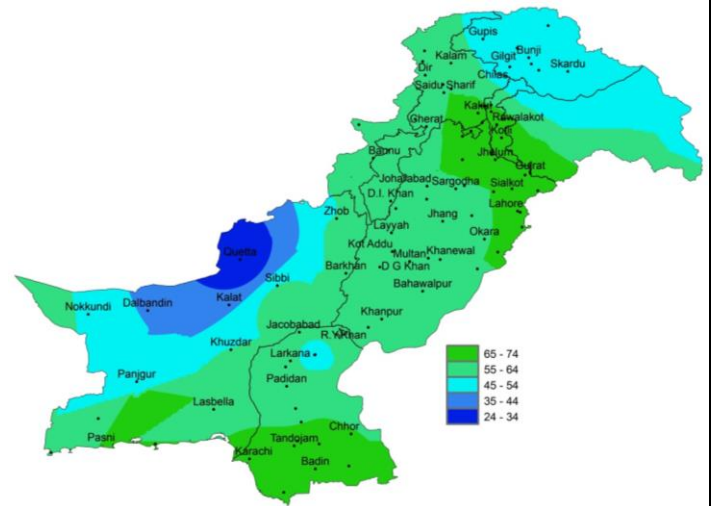

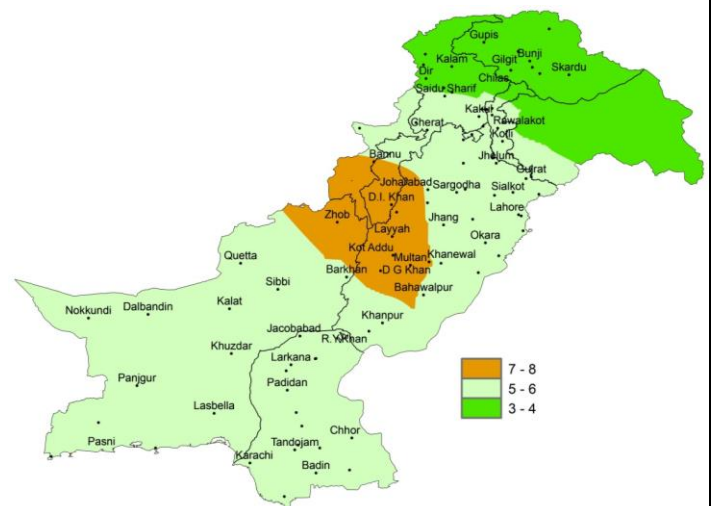**Figure.3: Relative Humidity in Percentage (%)**

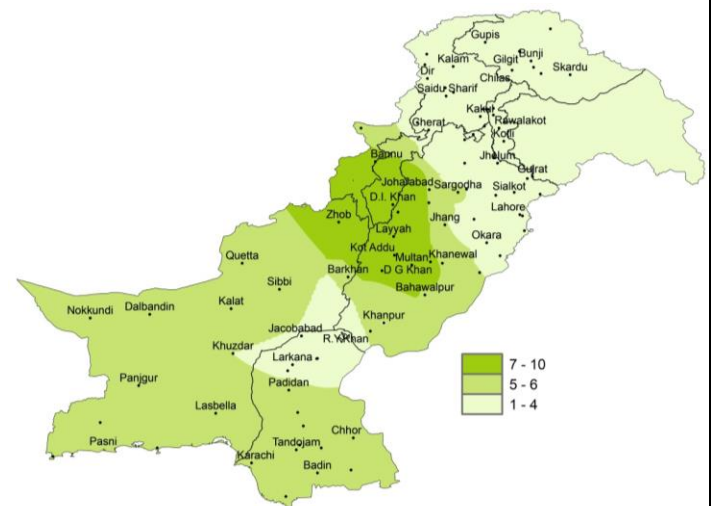**Figure.4: Reference Crop Evapotranspiration ETo (mm/day)**

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 06 days during the decade. Average relative humidity recorded as 53%. Mean day temperature was 40.2°C, with 103.6 hours bright sunshine duration. Wind speed recorded 3.1 km/hr with wind direction *north easterly.*

2.13   D.I. Khan

Dry weather reported as during the last decade; however weather remained cloudy for 06 days during the decade. Average relative humidity recorded as 61%. Mean day temperature was 40.2°C while night temperature recorded as 25.0°C with 75.2 hours bright sunshine duration. Wind speed recorded as 10.2 km/hr with mean wind direction *south easterly.*

2.14   Peshawar

Dry weather reported as during the last decade; however weather remained cloudy for 07 days during the decade. Average relative humidity recorded as 60%. Mean day temperature was 37.0 °C while night temperature recorded as 25.7 °C with 61.1 hours bright sunshine duration. Wind speed recorded as 3.6km/hr with mean wind direction *north westerly.*

2.15   Skardu

Rainfall reported as Trace (Not measureable) during the decade; however weather remained cloudy for 02 days during the decade. Average relative humidity recorded as 47%. Mean day temperature was 30.2 °C while night temperature recorded as 13.0 °C with 35.4 hours bright sunshine duration. Wind speed recorded as 0.8 km/hr with mean wind direction *East-south-easterly.*

2.16   Gilgit

Rainfall reported as Trace (Not measureable) during the decade; however weather remained cloudy for 10 days during the decade. Average relative humidity recorded as 48%. Mean day temperature was 35.0°C while night temperature recorded as 17.1°C with 87.5 hours bright sunshine duration. Wind speed recorded as 1.3 km/hr with mean wind direction *Variable.*

Ten Days Weather Advisory for Farmers (11ᵗʰ to 20ᵗʰ September, 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:** Mainly hot and humid weather is expected. However, rain/wind-thunderstorm is expected at isolated places in Islamabad, Rawalpindi, Gujranwala and Lahore divisions for few days during the 1ˢᵗ half of the current decade.

❖ **Khyber Pakhtunkhwa:** Mainly hot and humid weather is expected. However, rain/wind-thunderstorm is expected at isolated places in Malakand, Hazara, Kohat and Mardan divisions for few days during the 1ˢᵗ half of the current decade.

❖ **Sindh:** Mainly hot and humid weather is expected in most of the province during the decade.

❖ **Baluchistan:** Mainly hot and humid weather is expected in most of the province during the decade.

❖ **Gilgit-Baltistan:** Rain/wind-thunderstorm is expected at isolated places in the province in the evening/night during the current decade.

❖ **Kashmir:** Rain/wind-thunderstorm 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 irrigation plans in accordance with the expected weather, mentioned during the decade.

❖ Adopt better practices for weed management of Cotton crop as it is in critical weed period. Plant protection measures for worm may be initiated. Accordingly farmers are advised to take adoptive measures especially use of PB ropes in consultancy with plant protection department.

❖ Cotton picking may be initiated after 10 am in the morning as there will be dew present on cotton plants during early morning.

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 قابلِ ذکر اضافہ ہوسکتا ہے۔ جو کہ دن کے وقت c°2.8 اور رات کو c°2.2 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 و نسق) سے غربت میں کمی اور کسانوں کی زندگی میں خوشحالی لائی جاسکتی ہے۔

(ایگمپ پاکستان 2012-2014)