Decadal Agromet Bulletin of Pakistan

Highlights…

❖ Dry weather reported from most of the agricultural plains of the country during the last decade.

❖ Lowest minimum temperature recorded as -13.6°C at Skardu during the last decade.

❖ Cold and dry weather may prevail in most parts of the country however light to moderate rainfall (snowfall over mountains) is expected mainly in northern parts of the country during the current decade.

❖ Fog may prevail in the plains of Punjab and Sindh provinces due to dry weather conditions.

❖ Farmers are advised to schedule the irrigation plans in context of ongoing Rabi crops.

❖ 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.

❖ Measures may be taken to preserve the crops/nurseries from the damaging impacts of extreme cold conditions.
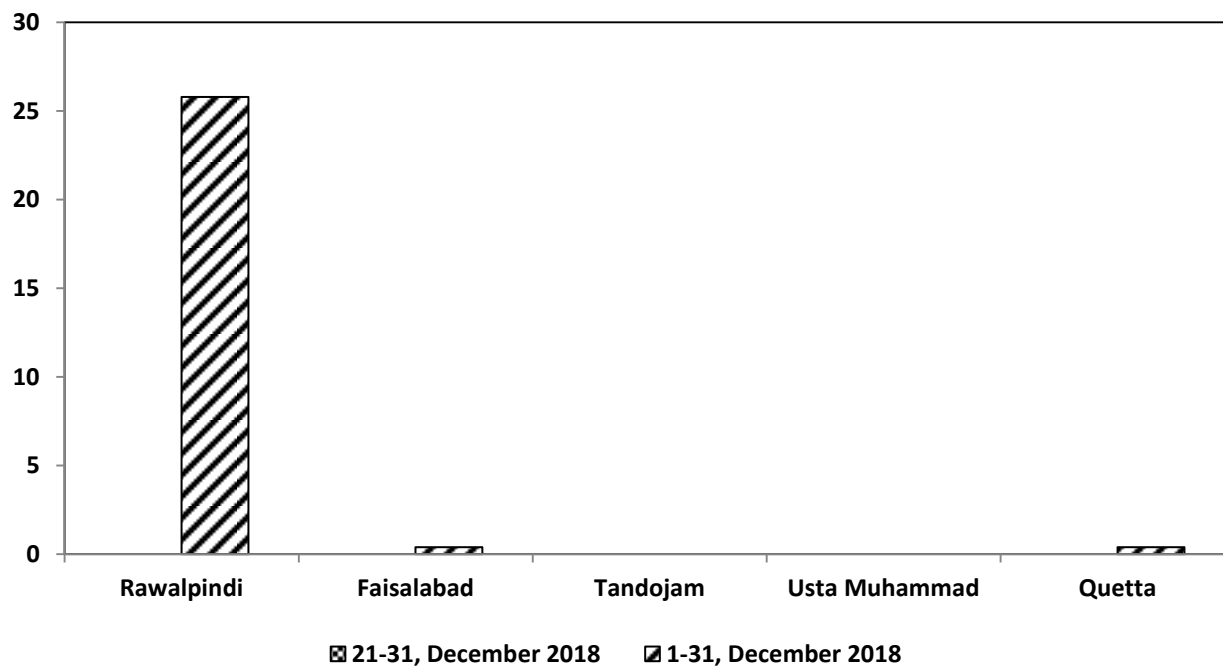
Meteorological Conditions during 3rd Decade of December, 2018

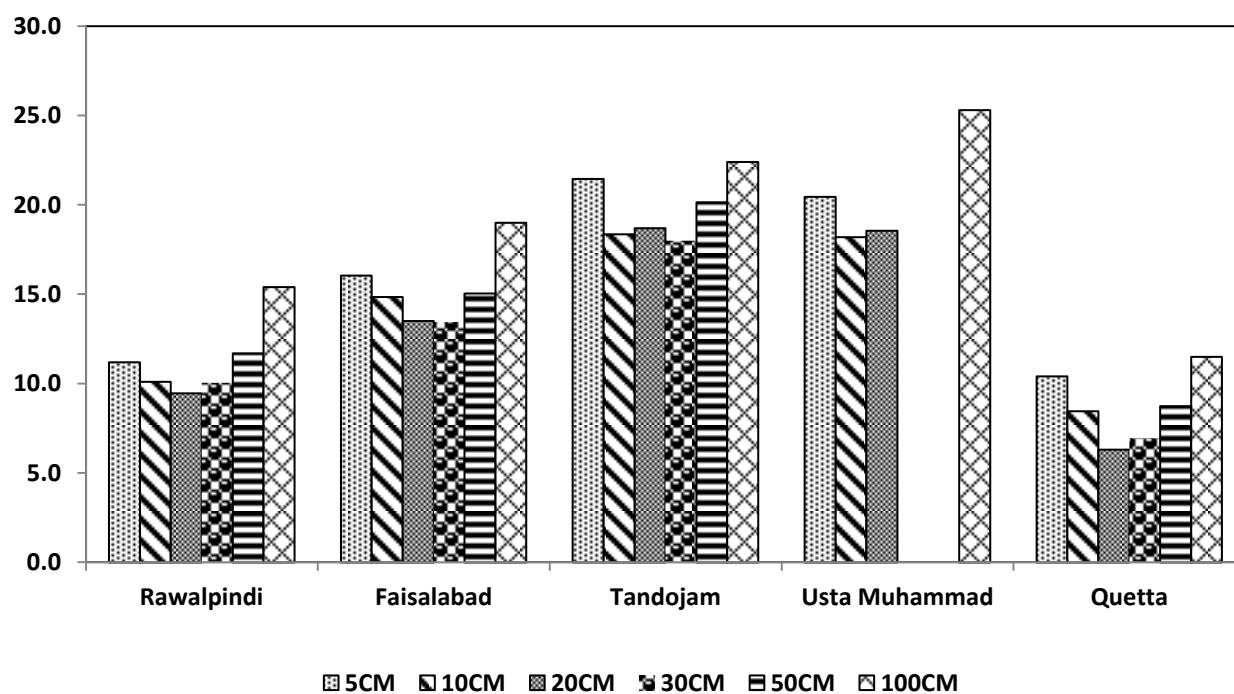| Sr. No.	Station	Precipitation (mm)			Air Temperature (°C)			Soil Temperatures (°C)						R.H (%)	Sunshine Duration(hours)	Wind Speed (km/hr)	ETo (mm/day)
		Normal	Actual	Dep	Tmax Dep	Tmin Dep	Mean	5cm	10cm	20cm	30cm	50cm	100cm				
1	Rawalpindi	0.5	0.0	-0.5	0.7	-3.6	9.8	11.2	10.1	9.5	10.1	11.7	15.4	64	84.6	0.3	0.8
2	Faisalabad	0.2	0.0	-0.2	0.5	-1.9	12.0	16.1	14.9	13.5	13.5	15.1	19.0	58	60.3	1.1	1.1
3	Jhelum	0.4	0.0	-0.4	-1.8	-3.6	10.6	11.4	10.9	10.4	11.3	13.2	***	63	83.9	1.0	1.0
4	Lahore	0.3	0.0	-0.3	0.0	-2.4	12.9	13.3	13.3	13.0	13.5	***	18.7	71	64.5	0.7	1.1
5	Sargodha	0.4	0.0	-0.4	-0.5	-1.5	12.3	16.1	15.0	14.0	14.8	***	19.2	72	71.2	1.1	1.1
6	Multan	0.1	0.0	-0.1	-1.4	-1.2	12.3	***	***	***	***	***	***	61	47.7	1.5	1.2
7	Khanpur	0.1	0.0	-0.1	0.8	-2.7	13.3	***	13.9	14.7	15.6	16.8	20.6	58	68.8	2.5	1.7
8	Tandojam	0.4	0.0	-0.4	0.6	-2.4	15.8	21.5	18.4	18.7	18.0	20.2	22.4	56	93.5	3.0	2.3
9	Sakrand☆	0.0	0.0	0.0	1.3	-0.7	15.1	20.6	***	***	***	***	25.7	56	104.0	4.6	2.5
11	Rohri	0.0	0.0	0.0	0.6	-1.5	15.7	***	***	***	***	***	***	54	85.4	1.3	1.7
12	D.I Khan	0.4	0.0	-0.4	-0.4	-2.3	12.4	16.5	14.9	14.8	16.0	7.2	***	75	82.6	4.5	1.6
13	Peshawar	0.6	0.0	-0.6	-1.4	-4.0	9.6	11.6	11.0	10.5	11.9	14.3	15.9	66	13.8	1.0	0.8
14	Usta .M	0.0	0.0	0.0	0.6	-2.5	14.0	20.5	18.2	18.6	***	***	25.3	56	***	0.5	1.2
15	Quetta	0.4	0.0	-0.4	0.2	1.2	6.1	10.4	8.5	6.3	7.0	8.8	11.5	31	103.5	4.2	1.8
16	Skardu	0.5	0.0	-0.5	-1.0	-5.0	-3.4	***	***	***	***	***	***	66	54.9	0.8	0.6
17	Gilgit	0.4	0.0	-0.4	0.7	-2.9	3.3	***	***	***	***	***	***	53	44.5	0.2	0.6

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 December, 2018

Precipitation(mm)

Rawalpindi   Faisalabad   Tandojam   Usta Muhammad   Quetta

⊠ 21-31, December 2018   ⊘ 1-31, December 2018

Soil Temperature(°C)

Rawalpindi   Faisalabad   Tandojam   Usta Muhammad   Quetta

⊞ 5CM   ◣ 10CM   ▦ 20CM   ◳ 30CM   ⊟ 50CM   ◿ 100CM

Past Weather (21ˢ to 31ˢᵗ December, 2018)

Dry weather reported from most of the agricultural plains of the country during the last decade.

1.1   Punjab

Dry weather reported from most of the agricultural plains of the Punjab. Decadal maximum & minimum both dropped below normal by 0.2°C & 2.4°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 64%, 68.7hrs, 1.2km/hr and 1.1mm/day respectively.

1.2   Sindh

Dry weather reported from agricultural plains of the Sindh. Decadal maximum raised above normal by 0.8°C & minimum dropped below normal by 1.5°C, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 55%, 94.3hrs, 3.0km/hr and 2.2mm/day respectively.

1.3   Khyber Pakhtunkhwa (KP)

Dry weather reported from most of the agricultural plains of KP. Decadal maximum and minimum both dropped below normal by 0.9°C & 3.2°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 71%, 48.2hrs, 2.8km/hr and 1.2mm/day respectively.

1.4   Balochistan

Dry weather reported from agricultural plains of Balochistan. Decadal maximum raised above normal by 0.4°C & minimum dropped below normal by 0.7°C, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 44%, 103.5hrs, 2.4km/hr and 1.5mm/day respectively.

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

Dry weather reported from few of the agricultural plains of G.B and Kashmir. Decadal maximum & minimum both dropped below normal by 0.2°C & 4.0°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 60%, 49.7hrs, 0.5km/hr and 0.6mm/day respectively.
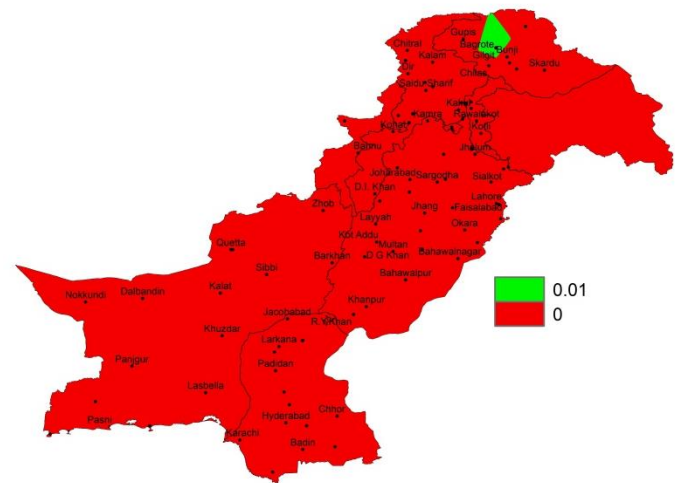
I.   Actual rainfall
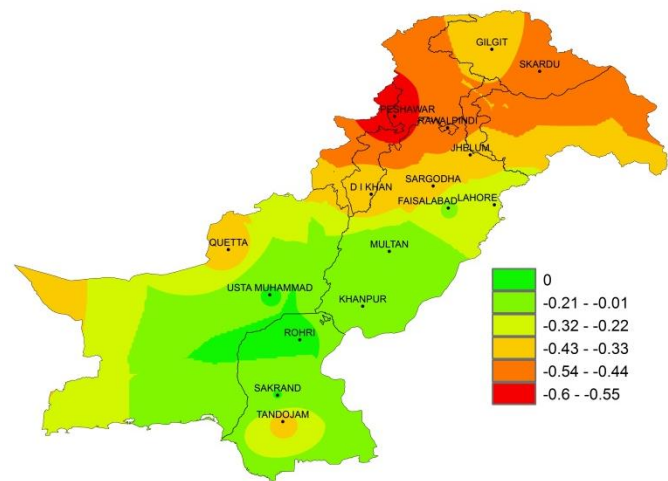
II.   Departure of rainfall from Normal
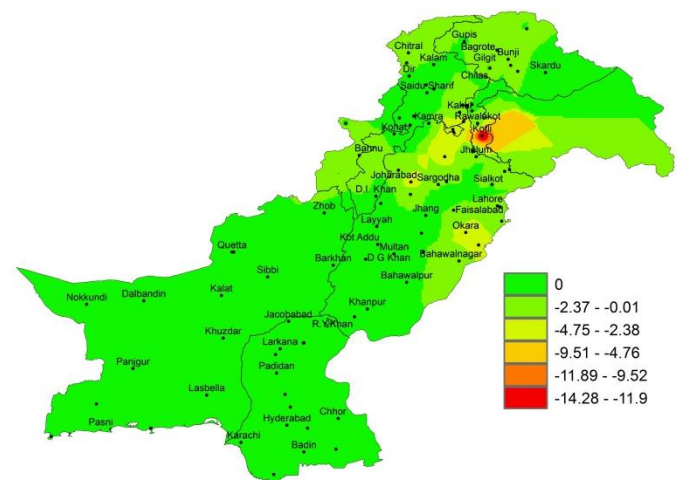
III.   Departure of rainfall from Previous Decade

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

2(a)   Past Weather for Major Agricultural Plains (21st to 31st December, 2018)

2.1   RAMC, Rawalpindi (Potohar region)

Dry weather reported during the decade; however weather remained cloudy for 02days during the decade. Average relative humidity recorded as 70%. Mean day temperature was 19.9°C while night temperature recorded as -0.3°C with 84.6hours bright sunshine duration. Wind speed recorded as 0.3km/hr with mean wind direction *north westerly*.

2.2   RAMC, Faisalabad (Central Punjab)

Dry weather reported during the decade; however weather remained cloudy for 02days during the decade. Average relative humidity recorded as 58%. Mean day temperature was 21.0°C while night temperature recorded as 3.0°C with 60.3hours bright sunshine duration. Wind speed recorded as 1.1km/hr with mean wind direction *north westerly*.
Wheat: Very good condition, tillering stage.

2.3   RAMC, Tandojam (Lower Sindh)

Dry weather reported during the decade; however weather remained cleared throughout the decade. Average relative humidity recorded as 56%. Mean day temperature was 24.9°C while night temperature recorded as 6.7°C with 93.5hours bright sunshine duration. Wind speed recorded as 3.0km/h with mean wind direction *northerly*.
*Wheat (TJ-83): Good condition, shooting stage.*

2.4   RAMC, Usta Muhammad (Eastern Balochistan)

Dry weather reported during the decade during the decade; however weather remained cleared throughout the decade. Average relative humidity recorded as 56%. Mean day temperature was 22.5°C while night temperature recorded as 5.4°C. Wind speed recorded as 0.5km/h with mean wind direction *north-easterly*.
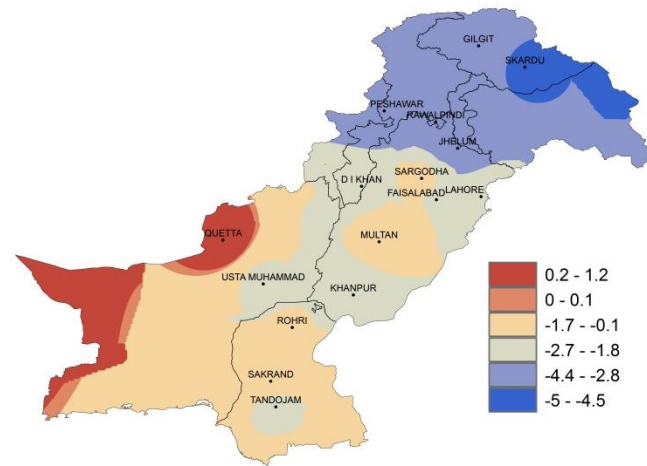*Wheat: Good condition, third leaf stage.*

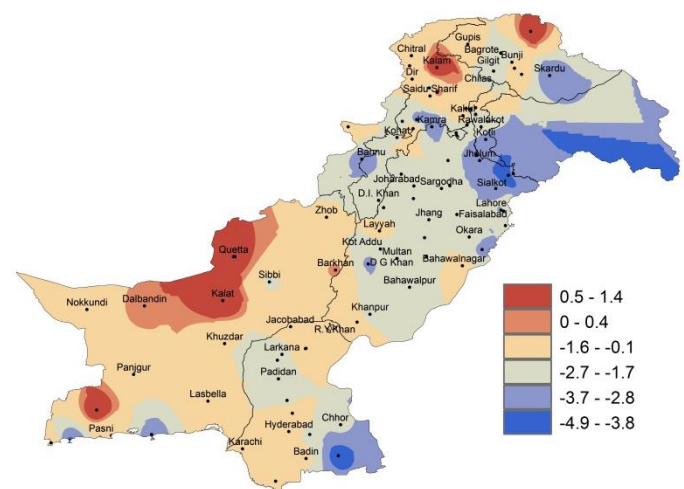### 2.5   RAMC, Quetta (Northern Balochistan)

Dry weather reported during the decade during the decade; however weather remained cloudy for 09days during the decade. Average relative humidity recorded as 31%. Mean day temperature was 13.0°C while night temperature recorded as -0.9°C with 103.5hours bright sunshine duration. Wind speed recorded as 4.2km/hr with mean wind direction *north westerly*.
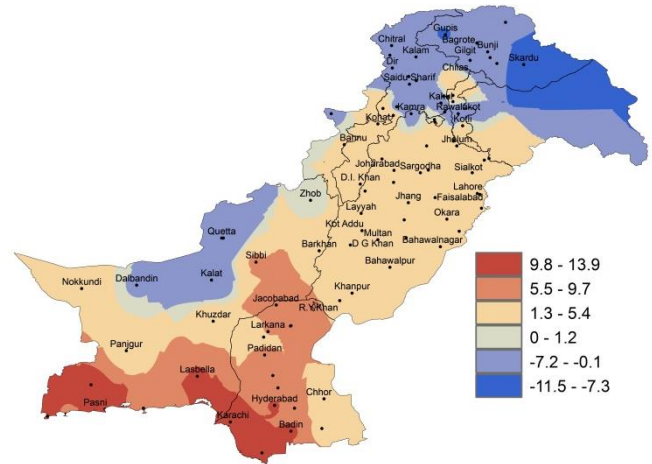
I.   **Actual min-temp**

II.   **Departure of min-temp from Normal**

III.   **Departure of min-temp from Previous Decade**

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

2(b)   Past Weather for Sub-Regional Agricultural Plains (21st to 31st December, 2018)

2.6   Jhelum

Dry weather reported during the decade during the decade; however weather remained cloudy for 05days during the decade. Average relative humidity recorded as 63%. Mean day temperature was 19.2°C while night temperature recorded as 2.0°C with 83.9hours bright sunshine duration. Wind speed recorded as 1.0km/hr with mean wind direction *north westerly.*

2.7   Lahore

Dry weather reported during the decade during the decade; however weather remained cloudy for 03days during the decade. Average relative humidity recorded as 71%. Mean day temperature was 19.7°C while night temperature recorded as 6.0°C with 64.5hours bright sunshine duration. Wind speed recorded as 0.7km/hr with mean wind direction *westerly.*

2.8   Sargodha

Dry weather reported during the decade during the decade; however weather remained cloudy for 01day during the decade. Average relative humidity recorded as 72%. Mean day temperature was 20.2°C while night temperature recorded as 4.4°C with 71.2hours bright sunshine duration. Wind speed recorded 1.11km/hr with mean wind direction *variable.*

2.9   Multan

Dry weather reported during the decade during the decade; however weather remained cloudy for 03days during the decade. Average relative humidity recorded as 61%. Mean day temperature was 20.0°C while night temperature recorded as 4.5°C with 47.7hours bright sunshine duration. Wind speed recorded 1.5km/hr with mean wind direction *north easterly.*

2.10   Khanpur

Dry weather reported during the decade; however weather remained cleared throughout the decade. Average relative humidity recorded as 58%. Mean day temperature was 22.9°C while night temperature recorded as 3.6°C with 68.5hours bright sunshine duration. Wind speed recorded 2.5km/hr with mean wind direction *north easterly.*

2.11   Sakrand

Dry weather reported during the decade; however weather remained cloudy for 01day during the decade. Average relative humidity recorded as 56%. Mean day temperature was 23.7°C while night temperature recorded as 6.5°C with 104.0hours bright sunshine duration. Wind speed recorded 4.62km/hr with wind direction *northerly.*
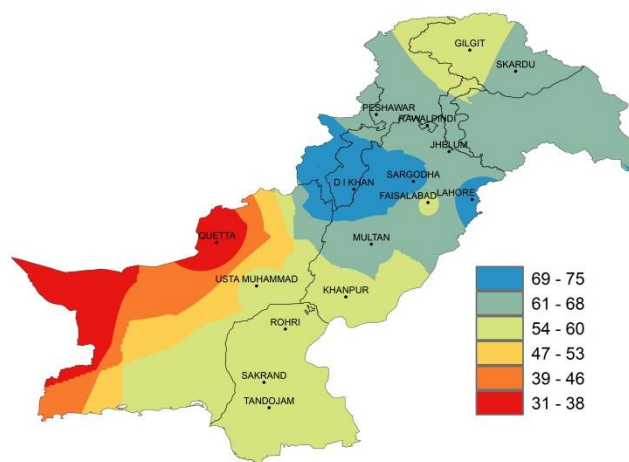

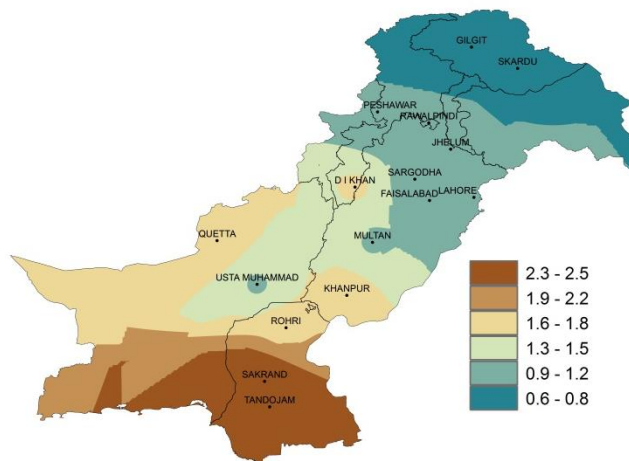***Figure.3: Relative Humidity in Percentage (%)***

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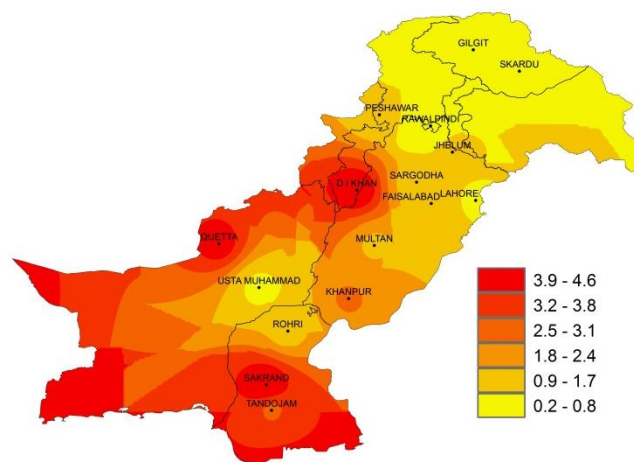

Figure 5: Wind Speed in kilometer per hour (km/h)

2.12   Rohri

Dry weather reported during the decade; however weather remained cleared throughout the decade. Average relative humidity recorded as 54%. Mean day temperature was 23.5°C while night temperature recorded as 7.9°C with 85.4hours bright sunshine duration. Wind speed recorded 1.3km/hr with wind direction *north easterly.*

2.13   D.I. Khan

Dry weather reported during the decade; however weather remained cloudy for 02days during the decade. Average relative humidity recorded as 75%. Mean day temperature was 20.9°C while night temperature recorded as 3.8°C with 82.6hours bright sunshine duration. Wind speed recorded as 4.5km/hr with mean wind direction *north weasterly.*

2.14   Peshawar

Dry weather reported during the decade; however weather remained cloudy for 04days during the decade. Average relative humidity recorded as 66%. Mean day temperature was 18.1°C while night temperature recorded as 1.0°C with 13.8hours bright sunshine duration. Wind speed recorded as 1.0km/hr with mean wind direction *south-westerly.*

2.15   Skardu

Rainfall reported as trace (not measurable) during the decade; however weather remained cloudy for 06days during the decade. Average relative humidity recorded as 66%. Mean day temperature was 4.8°C while night temperature recorded as -11.5°C with 54.9hours bright sunshine duration. Wind speed recorded as 0.8km/hr with mean wind direction *south-south easterly.*

2.16   Gilgit

Dry weather reported during the decade; however weather remained cloudy for 09days during the decade. Average relative humidity recorded as 53%. Mean day temperature was 12.0°C while night temperature recorded as -5.5°C with 44.5hours bright sunshine duration. Wind speed recorded as 0.2km/hr with mean wind direction *southerly.*

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

3.1   Temperature Forecast
Both day and night temperatures are likely to below normal in most of the plains of the country during the decade.

3.2   Wind Forecast
Normal wind pattern may prevail in most of the agricultural plains of the country during the decade; however dust/sand storms may occur in southern Punjab and Sindh.

3.3   Rain Forecast

- ❖ **Punjab:** Cold and dry weather is expected in most parts of the province; however light rainfall is expected in upper parts of the province during the current decade.
- ❖ **Khyber Pakhtunkhwa:** Light to moderate rain (with snowfall) is expected at isolated places of the province during the current decade.
- ❖ **Sindh:** Dry weather is expected in most parts of the province during the decade.
- ❖ **Balochistan:** Cold and dry weather is expected in most parts of the province.
- ❖ **Gilgit-Baltistan:** Light to moderate rainfall with snowfall over the mountains is expected during the decade.
- ❖ **Kashmir:** Light to mopderate rainfall with snowfall over the mountains is expected during the decade.

3.4 Advisory for Farmers

- ❖ Fog may prevail in the plains of Punjab and Sindh provinces due to dry weather conditions.
- ❖ Farmers are advised to schedule the irrigation plans in context of ongoing Rabi crops.
- ❖ 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.
- ❖ Measures may be taken to preserve the crops/nurseries from the damaging impacts of extreme cold conditions.

4.1 Precipitation Outlook (1st to 3rd January, 2019)

The forecast for the first three days (1st to 3rd) of the 1st decade of January, 2019 shows that mostly cold and dry weather is expected in most parts of the country while light to moderate rainfall (snowfall over mountains) is expected in particular areas of northern Punjab, K.P, north western Baluchistan, G.B & Kashmir.
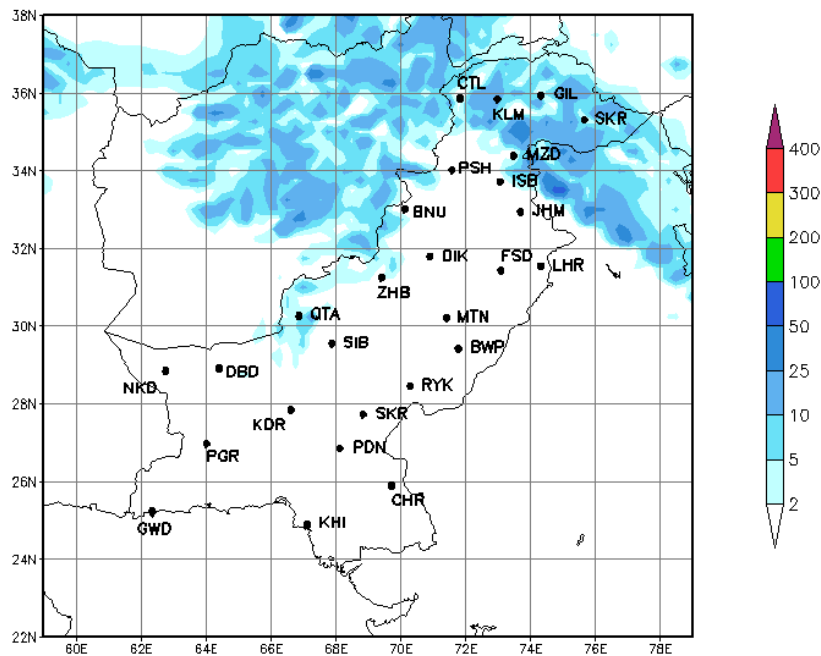
4.2 Precipitation Outlook (4th to 10th January, 2019)

The outlook for the last seven days (4th to 10th) of the first decade of January, 2019 shows that mostly cold and dry weather is expected in most parts of the country. While light to moderate rainfall with snowfall over mountains is expected at scattered places of northern Punjab, K.P, north western Baluchistan, G.B & Kashmir.
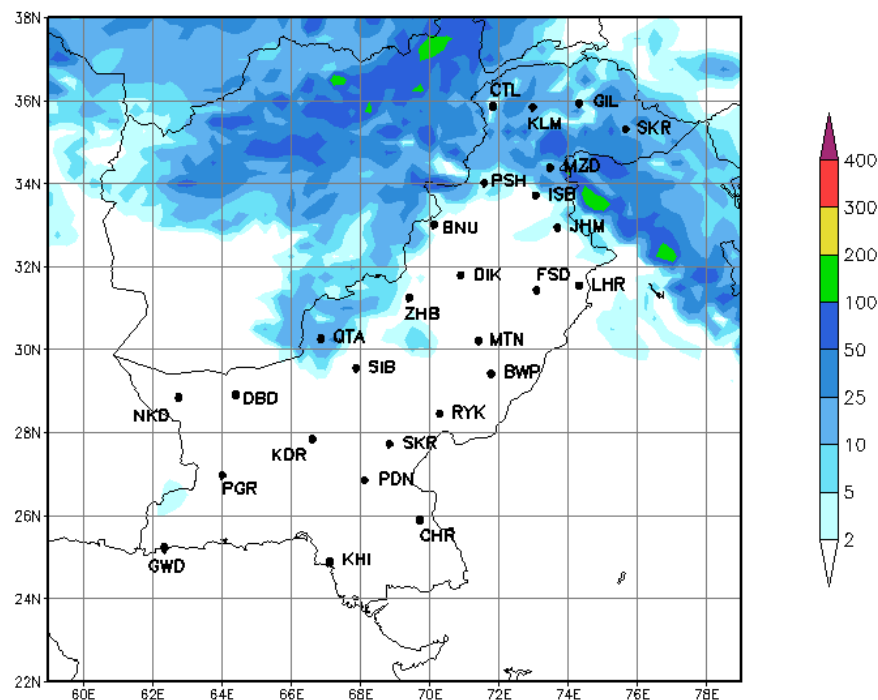
Findings of AgMIP Pakistan, University of Agriculture, Faisalabad

❖ 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)

١۔ 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۔

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

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

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

٥۔ 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 2014-2012)