Decadal Agromet Bulletin of Pakistan

Highlights….

- Light to moderate rainfall reported from most of the agricultural plains of K.P and light rainfall occurred at few agricultural plains of Punjab, Balochistan, G.B & Kashmir however, dry weather reported from Sindh.
- Highest amount of rainfall recorded as 37.0 mm at Malam Jabba during the last decade.
- Lowest Minimum temperature recorded as -10.2°C at Skardu during the last decade.
- Mostly dry weather is expected in most of the agricultural plains of the country; however light to moderate rain (with snowfall over the mountains) is expected in upper KP, G.B, Kashmir from 27th to 30th of the decade.
- Farmers obtaining crop water through tube wells are advised to schedule the irrigation as per crop requirement.
- Wheat cultivation is in progress in most of the irrigated areas. Farmers of irrigated areas should irrigate the crop as per requirement in accordance with the prevailing weather conditions. Normally first irrigation is given 20-25 days after sowing.
- Farmers are advised to cultivate winter vegetables in time.
- In areas like Potohar Region and adjoining areas of Khyber Pakhtunkhwa where rain water storages are available farmers are advised to irrigate crops by using available irrigation methods like sprinkler irrigation etc.

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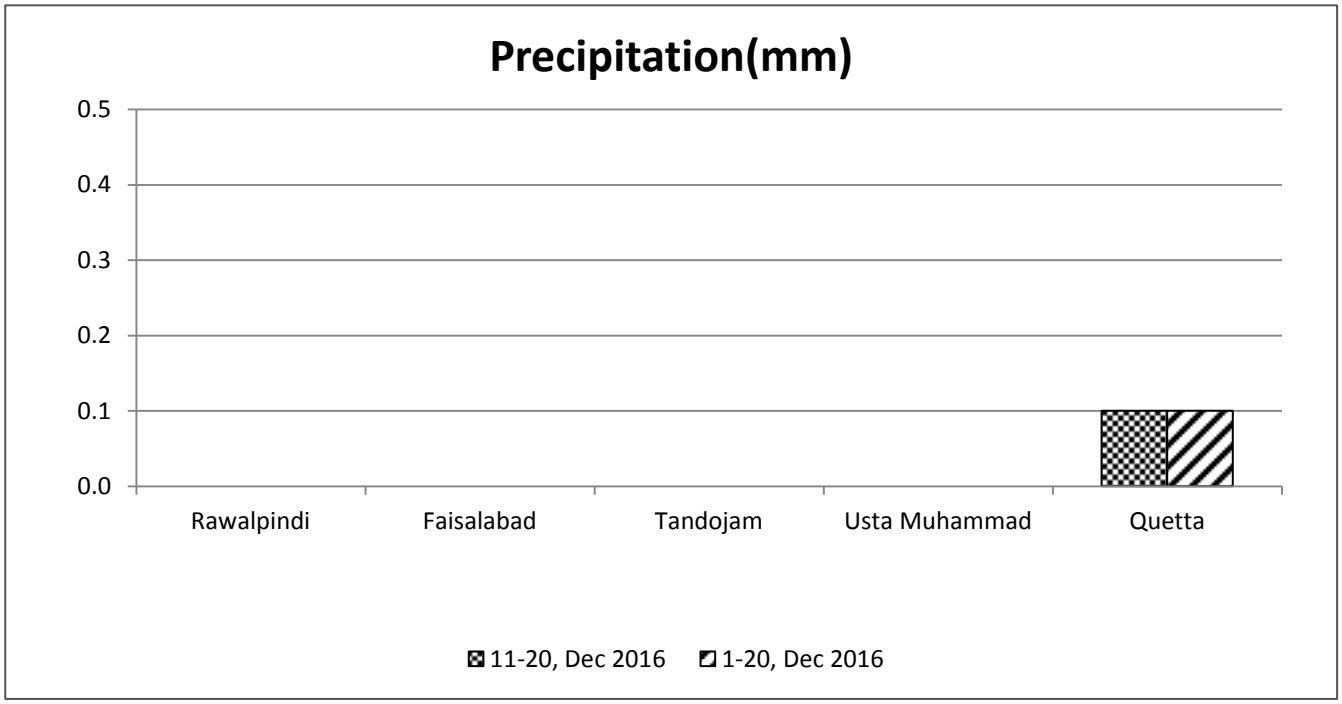
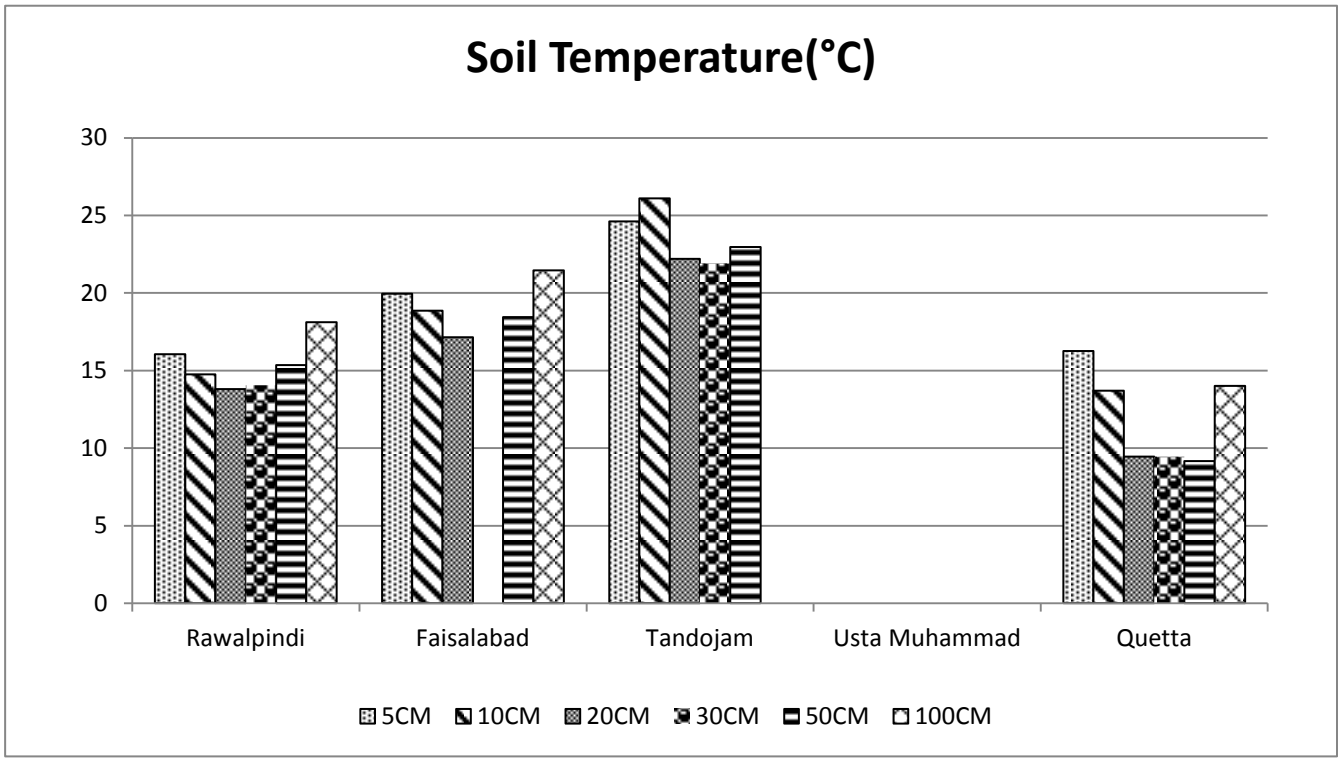
Meteorological Conditions during 2nd decade of December, 2016

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	1.5	0.0	-1.5	3.3	0.8	14.4	16.1	14.8	13.8	14.1	15.4	18.1	62	70.7	2.6	1.4
2	Faisalabad	0.2	0.0	-0.2	1.2	1.9	15.9	20.0	18.9	17.2	***	18.5	21.5	66	60.2	1.8	1.4
3	Jhelum	0.4	0.1	-0.3	0.8	-1.1	14.6	15.3	14.6	14.5	15.2	16.7	***	63	63.2	1.0	1.1
4	Lahore	0.4	0.0	-0.4	0.3	-1.2	15.5	17.4	17.3	17.2	17.4	***	21.4	72	53.3	1.3	1.2
5	Sargodha	0.6	0.0	-0.6	1.3	2.5	16.8	19.6	17.6	17.9	18.7	***	21.8	69	69.6	0.9	1.3
6	Multan	0.6	0.0	-0.6	0.9	3.5	17.0	***	***	***	***	***	***	61	61.8	0.8	1.3
7	Khanpur	1.6	0.0	-1.6	2.0	2.3	17.1	***	18.0	18.7	19.4	20.6	23.1	63	60.1	2.3	1.7
8	Tandojam	0.4	0.0	-0.4	0.7	1.6	18.9	24.6	26.1	22.2	21.9	23.0	***	55	74.7	2.0	2.1
9	Sakrand ☆	1.0	0.0	-1.0	3.4	4.7	19.4	28.0	***	***	***	***	27.0	58	87.9	4.3	2.6
11	Rohri	1.2	0.0	-1.2	2.9	-0.3	18.2	***	***	***	***	***	***	57	86.3	0.7	1.4
12	D.I Khan	0.1	0.0	-0.1	2.2	2.6	16.3	***	***	***	***	***	***	61	67.0	5.7	2.5
13	Peshawar	0.6	0.1	-0.5	2.1	-0.5	14.2	17.7	15.0	13.9	***	***	***	67	40.1	1.1	1.0
14	Usta .M	0.1	0.0	-0.1	2.7	-0.3	16.9	***	***	***	***	***	***	56	***	1.2	1.5
15	Quetta	0.2	0.1	-0.1	2.6	1.6	8.9	16.3	13.7	9.5	9.5	9.2	14.0	43	91.1	4.1	1.9
16	Skardu	1.2	0.0	-1.2	2.8	-3.0	0.8	***	***	***	***	***	***	62	64.1	0.4	0.6
17	Gilgit	0.3	0.1	-0.2	2.3	-1.0	5.9	***	***	***	***	***	***	54	49.5	1.9	0.9

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, 2016





1. Past Weather (11th to 20th December, 2016)

Light to moderate rainfall reported from most of the agricultural plains of K.P and light rainfall reported in the few agricultural plains of Punjab, Balochistan, G. B & Kashmir however, dry weather reported from Sindh.

1.1 Punjab

Light rainfall reported from the agricultural plains of Punjab. Chief amount of rainfall received Murree, Jhelum & Kamra. Decadal maximum & minimum both raised above normal 1.4°C & 1.2°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 65%, 62.7hrs, 1.5km/hr and 1.3mm/day respectively.

1.2 Sindh

Dry weather reported from the agricultural plains of Sindh. Decadal maximum & minimum both raised above normal 2.3°C & 2.0°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 57%, 83.0hrs, 2.3km/hr and 2.0mm/day respectively.

1.3 Khyber Pakhtunkhwa (KP)

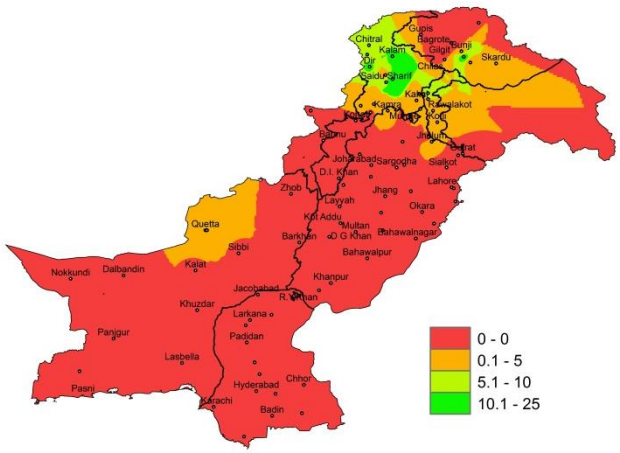
Light to moderate rainfall reported from the agricultural plains of KP. Chief amount of rainfall received Malam Jabba, Mirkhani & Dir. Decadal maximum & minimum both raised above normal 2.2°C & 1.1°C respectively, in the province, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 64%, 53.6hrs, 3.4km/hr and 1.8mm/day respectively.

1.4 Balochistan

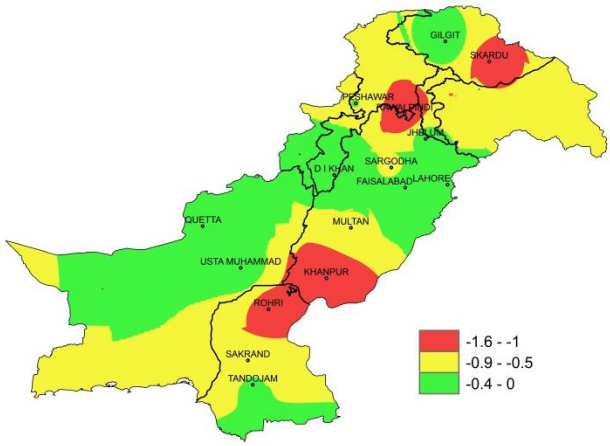
Light rainfall reported at one place of Balochistan i.e. Quetta. Decadal maximum & minimum both raised above normal 2.7°C & 0.7°C respectively, in the province, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 50%, 91.1hrs, 2.7km/hr and 1.7mm/day respectively.

1.5 Gilgit-Baltistan and Azad Jammu & Kashmir

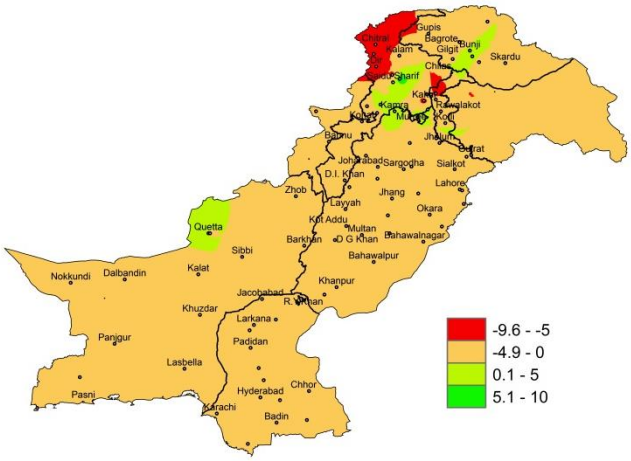
Light rainfall reported from the agricultural plains of GB & Kashmir. Chief amount of rainfall received Muzzaffarabad, Garhi Doppata & Gupis. Decadal maximum raised above normal by 3.0°C & minimum dropped below normal by 2.0°C, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 58%, 56.8hrs, 1.2km/hr and 0.8mm/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 in "mm"

2(a) Past Weather for Major Agricultural Plains (11th to 20th December, 2016)

2.1 RAMC, Rawalpindi (Potohar region)

Dry weather reported during the decade; however weather remained cloudy for 05days. Average relative humidity recorded as 62%. Mean day temperature was 23.6°C while night temperature recorded as 5.2°C with 70.7hours bright sunshine duration. Wind speed recorded as 2.6km/hr with mean wind direction *westerly.*

2.2 RAMC, Faisalabad (Central Punjab)

Dry weather reported during the decade; however weather remained cloudy for 04days. Average relative humidity recorded as 66%. Mean day temperature was 23.5°C while night temperature recorded as 8.2°C with 60.15hours bright sunshine duration. Wind speed recorded as 1.8km/hr with mean wind direction *north westerly*.
Wheat: *Very Good condition, third leaf completed.*

2.3 RAMC, Tandojam (Lower Sindh)

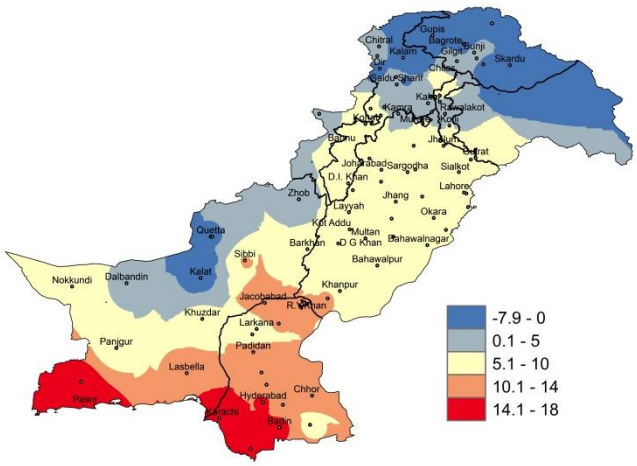
Dry weather reported during the decade; however weather remained cloudy for 03days. Average relative humidity recorded as 55%. Mean day temperature was 26.2°C while night temperature recorded as 11.5°C with 74.7hours bright sunshine duration. Wind speed recorded as 2.0km/h with mean wind direction *north easterly.*
Wheat (Imdad): *Good condition, shooting stage*.

2.4 RAMC, Usta Muhammad (Eastern Balochistan)

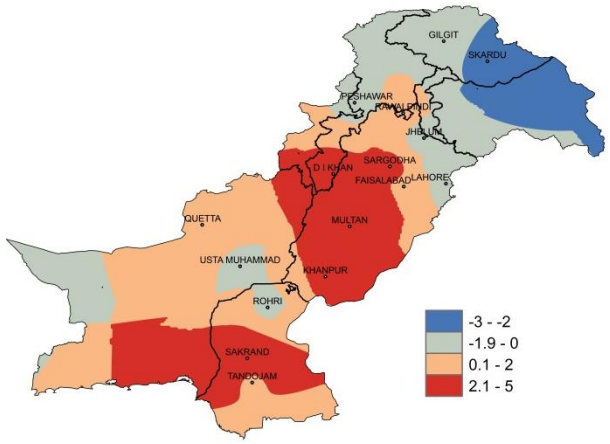
Dry weather reported during the decade; however weather remained clear throughout the decade. Average relative humidity recorded as 56%. Mean day temperature was 25.4°C while night temperature recorded as 8.4°C. Wind speed recorded as 1.2km/h with mean wind direction *north easterly*.
Wheat: *Very Good condition, Third leaf stage*.

2.5 RAMC, Quetta (Northern Balochistan)

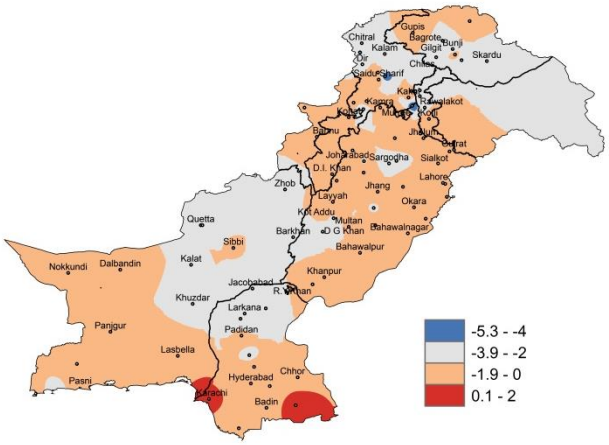
Rainfall reported as Trace (not measureable) during the decade; however weather remained cloudy for 08days. Average relative humidity recorded as 43%. Mean day temperature was 17.0°C while night temperature recorded as 0.8°C with 91.1hours bright sunshine duration. Wind speed recorded as 4.1km/hr with mean wind direction *southerly.*
Wheat (Local White): *Very Good condition, Third leaf stage*



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 in "°C"

2(b) Past Weather for Sub-Regional Agricultural Plains (11th to 20th December, 2016)

2.6 Jhelum

Rainfall reported as Trace (not measureable) during the decade; however weather remained cloudy for 07days. Average relative humidity recorded as 63%. Mean day temperature was 23.0°C while night temperature recorded as 6.2°C with 63.2hours 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; however weather remained cloudy for 04days. Average relative humidity recorded as 72%. Mean day temperature was 22.2°C while night temperature recorded as 8.8°C with 53.3hours bright sunshine duration. Wind speed recorded as 1.3km/hr with mean wind direction *north westerly*.

2.8 Sargodha

Dry weather reported during the decade; however weather remained cloudy for 05days. Average relative humidity recorded as 69%. Mean day temperature was 23.9°C while night temperature recorded as 9.7°C with 69.6hours bright sunshine duration. Wind speed recorded 0.9km/hr with mean wind direction *variable.*

2.9 Multan

Dry weather reported during the decade; however weather remained cloudy for 05days. Average relative humidity recorded as 61%. Mean day temperature was 24.1°C while night temperature recorded as 9.9°C with 61.8hours bright sunshine duration. Wind speed recorded 0.8 km/hr with mean wind direction *southerly.*

2.10 Khanpur

Dry weather reported during the decade however weather remained cloudy for 04days. Average relative humidity recorded as 63%. Mean day temperature was 25.0°C while night temperature recorded as 9.2°C with 60.1hours bright sunshine duration. Wind speed recorded 2.3km/hr with mean wind direction *north easterly.*

2.11 Sakrand

Dry weather reported during the decade; however weather remained cloudy for 04days. Average relative humidity recorded as 58%. Mean day temperature was 26.0°C while night temperature recorded as 12.7°C with 87.9hours bright sunshine duration. Wind speed recorded 4.3km/hr with wind direction *north westerly.*

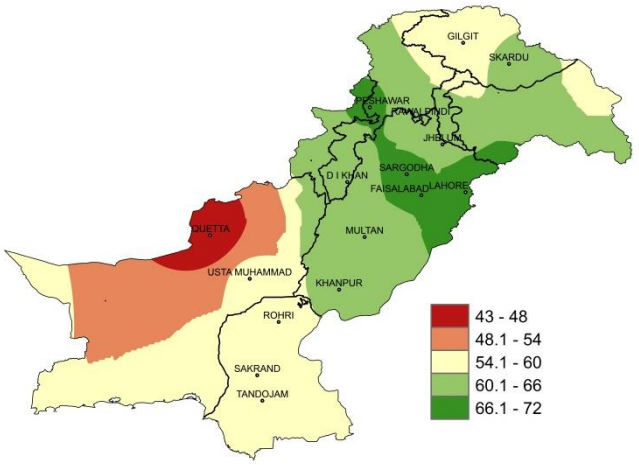


Figure.3: Relative Humidity in Percentage (%)

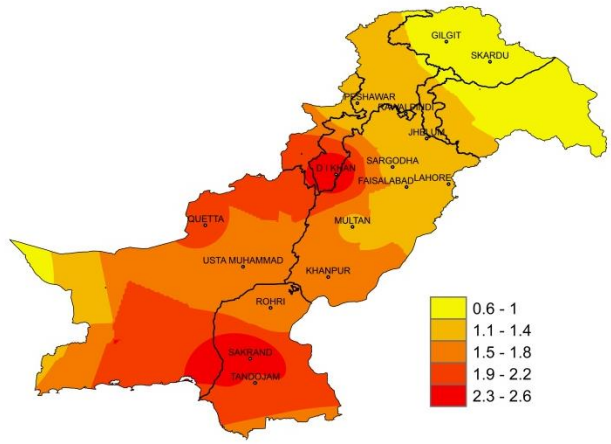


Figure.4: Reference Crop Evapotranspiration "ETo" in mm/day

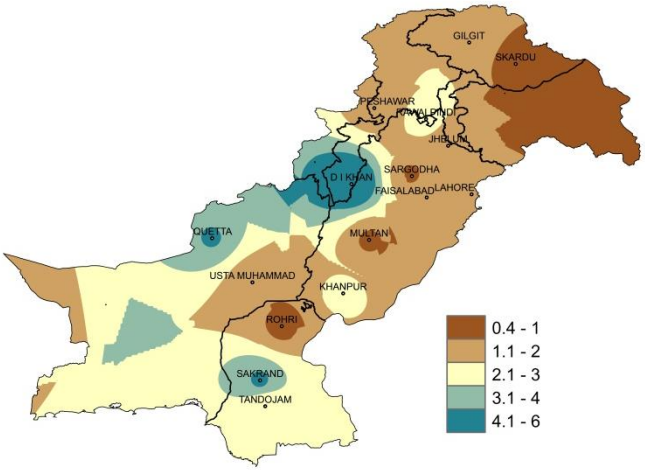


Figure 5: Wind Speed in kilometer per hour (km/h)

2.12 Rohri

Dry weather reported during the decade; however weather remained cloudy for 01 day. Average relative humidity recorded as 57%. Mean day temperature was 26.2°C while night temperature recorded as 10.2°C with 86.3hours bright sunshine duration. Wind speed recorded 0.7km/hr with wind direction *easterly*.

2.13 D.I. Khan

Dry weather reported during the decade; however weather remained cloudy for 10days. Average relative humidity recorded as 61%. Mean day temperature was 24.7°C while night temperature recorded as 7.9°C with 67.0hours bright sunshine duration. Wind speed recorded 5.7km/hr with wind direction *north westerly*.

2.14 Peshawar

Rainfall reported as Trace (not measureable) during the decade; however weather remained cloudy for 08days. Average relative humidity recorded as 67%. Mean day temperature was 22.7°C while night temperature recorded as 5.7°C with 40.1hours bright sunshine duration. Wind speed recorded as 1.1km/hr with mean wind direction *south westerly*.

2.15 Skardu

Dry weather reported during the decade; however weather remained cloudy for 03days. Average relative humidity recorded as 62%. Mean day temperature was 9.5°C while night temperature recorded as -7.9°C with 64.1hours bright sunshine duration. Wind speed recorded as 0.4km/hr with mean wind direction *easterly*.

2.16 Gilgit

Rainfall reported as 0.1mm during the decade; however weather remained cloudy for 10days. Average relative humidity recorded as 54%. Mean day temperature was 14.3°C while night temperature recorded as -2.6°C with 49.5hours bright sunshine duration. Wind speed recorded as 1.9km/hr with mean wind direction *variable.*

3 Ten Days Weather Advisory for Farmers (21st to 31st December, 2016)

3.1 Temperature Forecast

Night temperatures are expected to drop slightly (1-2°C) in most of the agricultural 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.

3.3 Rain Forecast

- **Punjab**: Cold and dry weather is expected in most parts of the province. Also dense fog may prevail in Lahore, Gujranwala, Faisalabad & Sargodha divisions during the decade.
- **Khyber Pakhtunkhwa**: Mainly cold and dry weather is expected during the decade however light to moderate rainfall is expected at scattered places in KP including Malakand & Hazara divisions from 27th to 29th of the decade.
- **Sindh:** Dry weather is expected in most parts of the province.
- **Balochistan:** Mainly cold and dry weather is expected in most parts of the province
- **Gilgit Baltistan:** Mainly cold and dry but cloudy weather is expected in most parts of G.B however light to moderate rain with snowfall is expected at scattered places from 24th to 25th and from 28th to 30th of the decade.
- **Kashmir:** Mainly cold and dry but cloudy weather is expected in most parts of the Kashmir however light to moderate rain with snowfall is expected at Muzzaffarabad and Rawalakot regions from 27th to 29th of the decade.

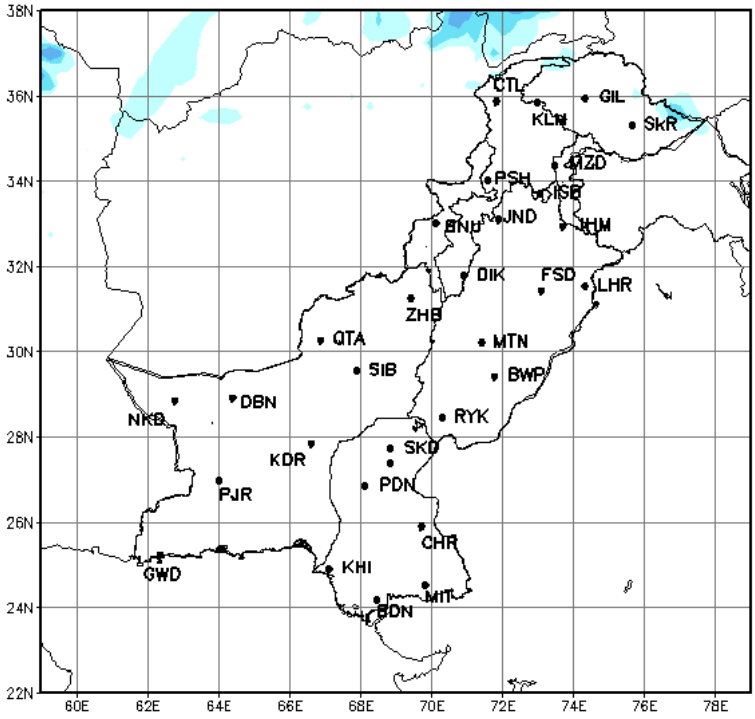
3.4 Advisory for Farmers

During the last two months dry weather has been reported from most of the agricultural plains of the country and is likely to prevail by the end of December. Keeping in view the present and expected dry atmospheric/soil conditions following advices are proposed farming community especially for rainfed areas of Khyber Pakhtunkhwa and Punjab.

- Farmers obtaining crop water through tube wells are advised to schedule the irrigation as per crop requirement.
- Wheat cultivation is in progress in most of the irrigated areas. Farmers of irrigated areas should irrigate the crop as per requirement in accordance with the prevailing weather conditions. Normally first irrigation is given 20-25 days after sowing.
- Farmers are advised to cultivate winter vegetables in time.
- In areas like Potohar Region and adjoining areas of Khyber Pakhtunkhwa where rain water storages are available farmers are advised to irrigate crops by using available irrigation methods like sprinkler irrigation etc.
- 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.

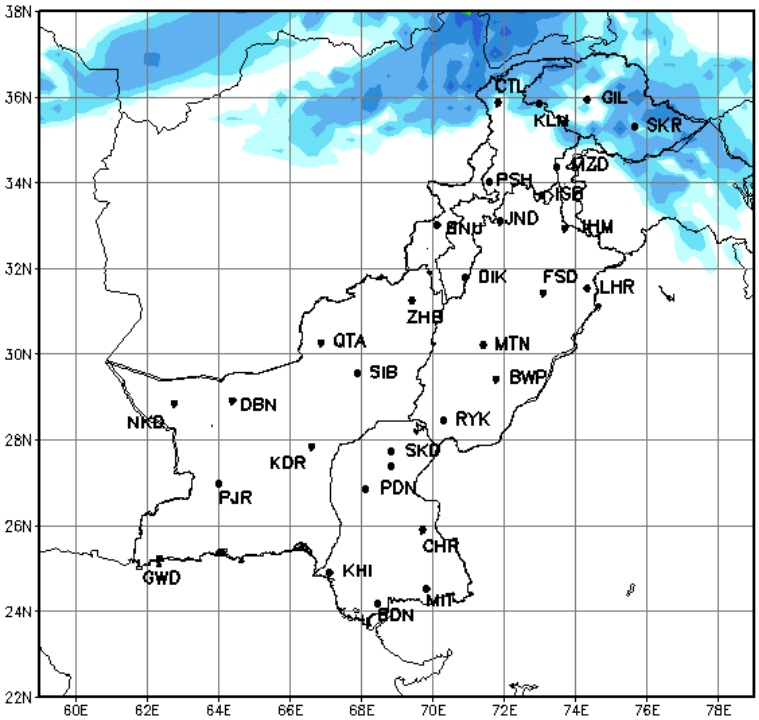
4.1 Precipitation Forecast (21st to 23rd December, 2016)

The forecast for the next three days (21st to 23rd) of the third decade of December 2016 shows that dry weather is expected in all the agricultural plains of country however light rainfall is expected in isolated places of Upper KP and GB.



4.2 Precipitation Outlook (24th to 31st December, 2016)

The outlook for the last seven days (24th to 31st) of the third decade of December 2016 shows that light to moderate rainfall is expected in upper KP, G.B & Kashmir, while dry weather may prevail in rest of the country.



Findings of AgMIP Paksitan, 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)