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Decadal Agromet Bulletin of Pakistan

Highlights….

- Moderate to heavy rainfall reported in the agricultural plains of Punjab, GB & Kashmir & K.P. Light to moderate rainfall reported in agriculture plains of Balochistan, and light rainfall reported in agricultural plains of Sindh during the last decade.
- Highest amount of rainfall reported 253.9mm at Gujranwala during the last decade.
- Highest Maximum temperature recorded 46.5°C at Dalbandin during the last decade.
- Rain/thunderstorm is expected in most of the agricultural plains of the country during the decade.
- Farmers obtaining crop water through tube wells are advised to schedule the irrigation according to the expected weather mentioned during the decade.
- Farmers are advised to control further weeds growth at the present growing stages to stop any negative impact over the crops. Weeds removing practices should be started soon after expected rains in the mentioned.
- Farmers are advised to take in time precautionary measures to protect their crops, livestock and other property from any expected heavy rains.
- Pest/viral attacks are expected over cotton and sugarcane crops during hot and humid conditions during monsoon. Farmers should be very careful and take in time precautionary measures in this regard.

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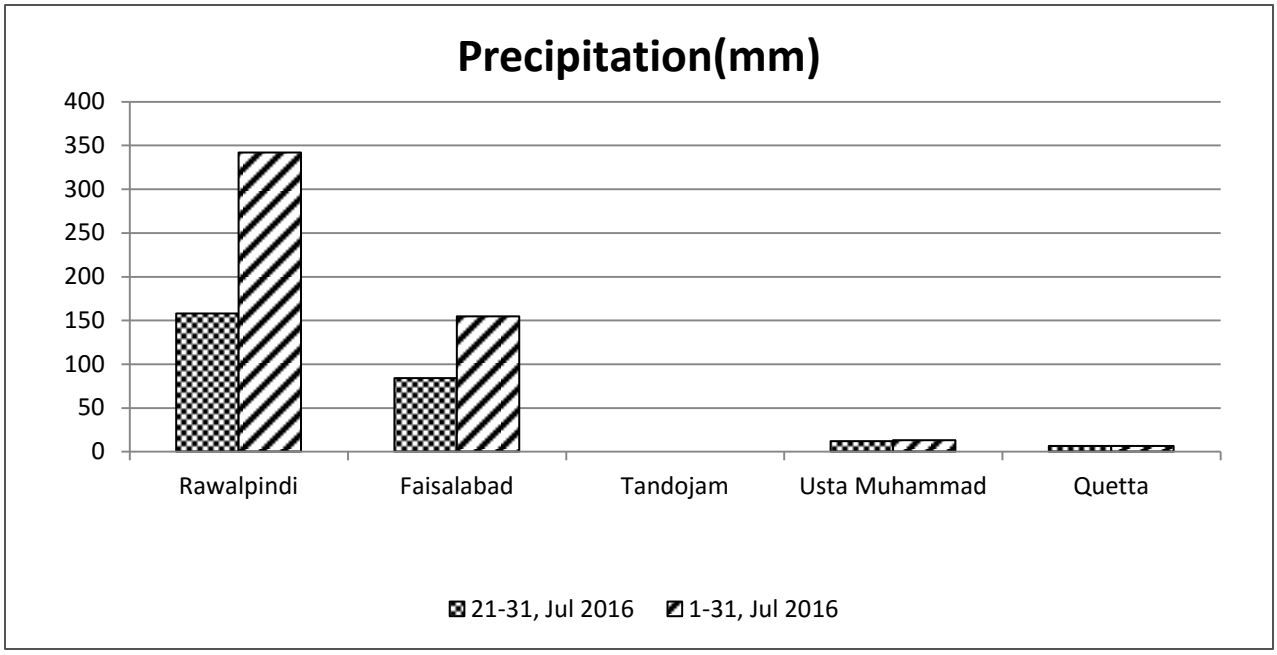
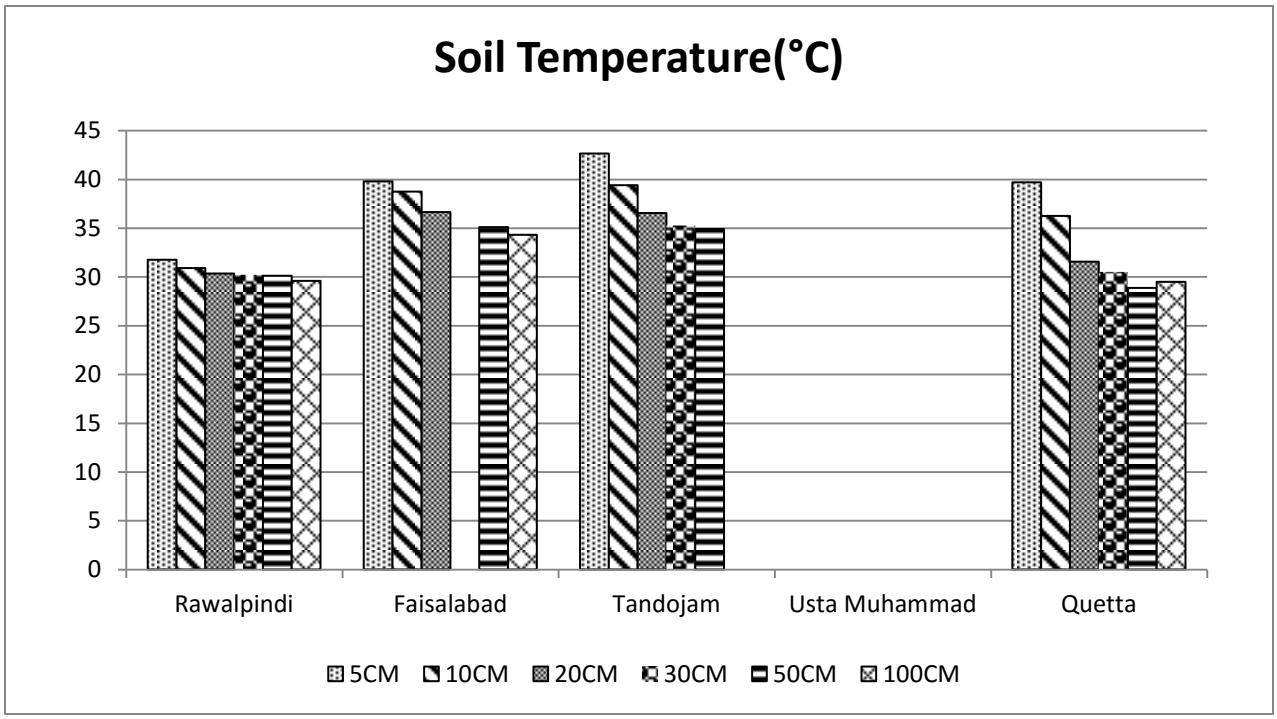
Meteorological conditions during 3rd decade of July, 2016

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	13.1	157.9	144.8	-0.3	0.4	29.0	31.8	30.9	30.4	30.2	30.1	29.6	73	83.5	3.7	5.0
2	FAISALABAD	2.7	84.0	81.3	0.3	0.0	32.0	39.8	38.8	36.7	***	35.1	34.3	67	80.1	5.3	5.6
3	JHELUM	8.3	135.5	127.2	-0.1	-2.4	29.4	34.2	33.2	31.9	27.2	30.2	***	75	74.2	5.4	5.1
4	LAHORE	6.5	51.9	45.4	0.2	-0.6	30.9	34.4	34.0	32.5	31.5	***	***	70	52.4	3.5	4.4
5	SARGODHA	5.4	161.2	155.8	-2.2	-1.0	30.6	34.3	33.3	31.8	31.4	30.5	30.4	76	75.3	4.1	4.9
6	MULTAN	1.4	14.4	13.0	1.1	0.9	34.4	***	***	***	***	***	***	59	99.3	5.4	6.6
7	KHANPUR	2.0	1.2	-0.8	1.8	-0.2	34.3	***	39.3	39.3	39.1	39.0	36.7	55	109.3	5.0	6.9
8	TANDOJAM	1.8	0.0	-1.8	2.6	-0.5	31.9	42.7	39.4	36.6	35.3	34.9	***	61	111.4	14.4	8.2
9	SAKRAND ☆	4.2	0.0	-4.2	1.0	1.1	33.2	50.0	***	***	***	***	36.7	54	110.7	5.7	7.0
11	D I KHAN	3.0	0.0	-3.0	-0.5	0.4	32.0	***	***	***	***	***	***	66	77.9	***	5.9
11	PESHAWAR	4.4	20.0	15.6	0.0	0.2	31.4	37.1	34.0	33.0	***	***	***	67	79.3	5.2	5.5
12	USTA MUHAMMAD	3.5	12.0	8.5	-0.7	1.1	33.5	***	***	***	***	***	***	67	***	4.6	4.4
13	QUETTA	0.0	6.4	6.4	-0.2	-0.2	28.3	39.7	36.3	31.6	30.5	28.9	29.5	37	108.4	5.5	6.5
14	SKARDU	0.2	3.4	3.2	0.1	-1.7	23.1	***	***	***	***	***	***	44	75.2	5.7	5.3
15	GILGIT	0.6	3.0	2.4	0.0	1.2	27.1	***	***	***	***	***	***	47	104.1	3.4	5.6

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 years climatic (normal) data for computing departures.

Graph at RAMCs during July, 2016





1. Past Weather (21st to 31st July, 2016)

Moderate to heavy rainfall reported in the agricultural plains of Punjab, GB & Kashmir and K.P. Light to moderate rainfall reported in agriculture plains of Balochistan, and light rainfall reported in agricultural plains of Sindh during the last decade

1.1 Punjab

Moderate to Heavy rainfall reported in the agricultural plains of Punjab. Chief amount of rainfall received in Gujranwala, Gujrat & Kamra. Decadal maximum raised above normal by 0.1°C & minimum dropped below normal by 0.4°C in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 68%, 82.0hrs, 4.6km/hr and 5.5mm/day respectively.

1.2 Sindh

Light rainfall reported in the agricultural plains of Sindh. Chief amount of rainfall received in Mitthi, Jacobabad & Moen Jo Daro. Decadal maximum & minimum both raised above normal by 1.2°C & 0.3°C respectively, in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 38%, 74.0hrs, 6.7km/hr and 7.6mm/day respectively.

1.3 Khyber Pakhtunkhwa (KP)

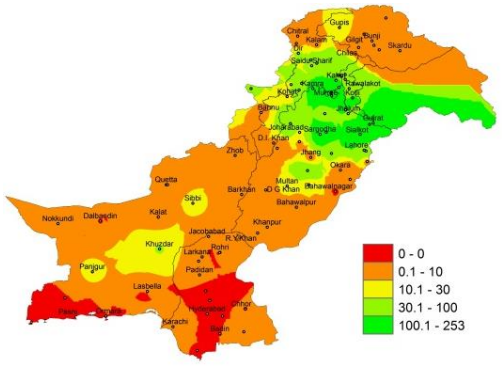
Moderate to Heavy rainfall reported in the agricultural plains of KP. Chief amount of rainfall received in Kakul, Malam jabba & Cherat. Decadal maximum dropped below normal by 0.3°C & minimum raised above normal by 0.3°C in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 67%, 78.6hrs, 5.2km/hr and 5.7mm/day respectively.

1.4 Balochistan

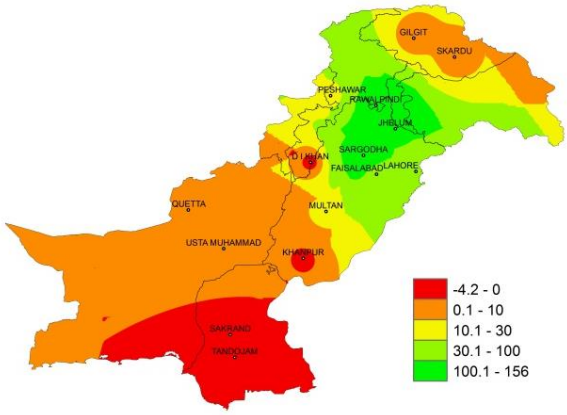
Light to moderate rainfall reported in the agricultural plains of Balochistan. Chief amount of rainfall received in Khuzdar, Sibbi & Pangur. Decadal maximum dropped below normal by 0.4°C & minimum raised above normal by 0.4°C in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 52%, 108.4hrs, 5.1km/hr and 5.5mm/day respectively.

1.5 Gilgit-Baltistan and Azad Jammu & Kashmir

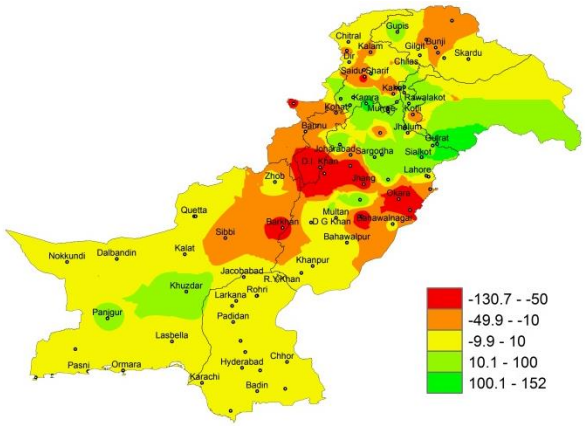
Moderate to heavy rainfall reported in the agricultural plains of GB & Kashmir. Chief amount of rainfall received Kotli, Muzaffarabad & Rawalakot. Decadal maximum remained normal & minimum temperature dropped below normal by 0.3°C in the province. Whereas mean values of relative humidity, sunshine hour, wind speed & ETo were recorded as 46%, 89.7hrs, 4.6km/hr and 5.5mm/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 (21st to 31st July, 2016)

2.1 RAMC, Rawalpindi (Potohar region)

Rainfall reported as 157.9mm during the decade; however weather remained cloudy for 10days. Average relative humidity recorded as 73%. Mean day temperature was 34.1°C while night temperature recorded as 23.8°C with 83.5hours bright sunshine duration. Wind speed recorded as 3.7km/hr with mean wind direction *Westerly*.

2.2 RAMC, Faisalabad (Central Punjab)

Rainfall reported as 84.0mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 67%. Mean day temperature was 37.1°C while night temperature recorded as 26.9°C with 80.1hours bright sunshine duration. Wind speed recorded as 5.3km/hr with mean wind direction *south easterly*.
Cotton: Very good condition, flowering stage completed.

2.3 RAMC, Tandojam (Lower Sindh)

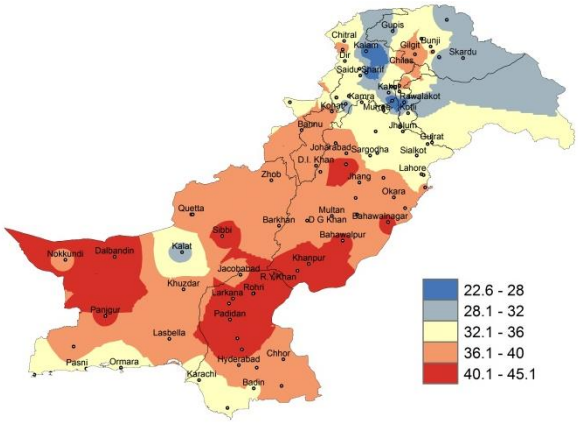
Dry weather reported during the decade; however weather remained cloudy for 07days. Average relative humidity recorded as 61%. Mean day temperature was 38.0°C while night temperature recorded as 25.7°C with 111.4hours bright sunshine duration. Wind speed recorded as 14.6km/h with mean wind direction *south westerly*.
Cotton (Star-2): Good condition, flowering stage.

2.4 RAMC, Usta Muhammad (Eastern Balochistan)

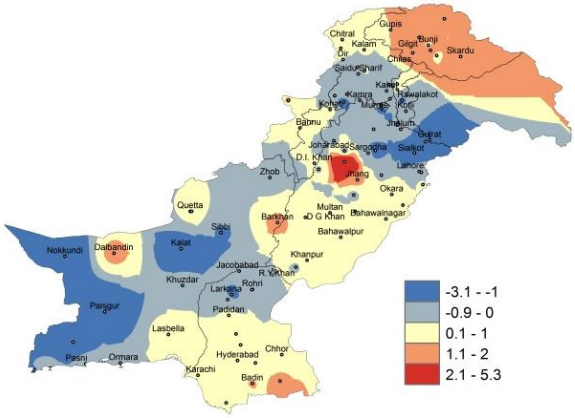
Rainfall reported as 12.0mm during the decade; however weather remained cloudy for 07days. Average relative humidity recorded as 67%. Mean day temperature was 39.6°C while night temperature recorded as 27.4°C.
Rice: Plant transferring in the field.

2.5 RAMC, Quetta (Northern Balochistan)

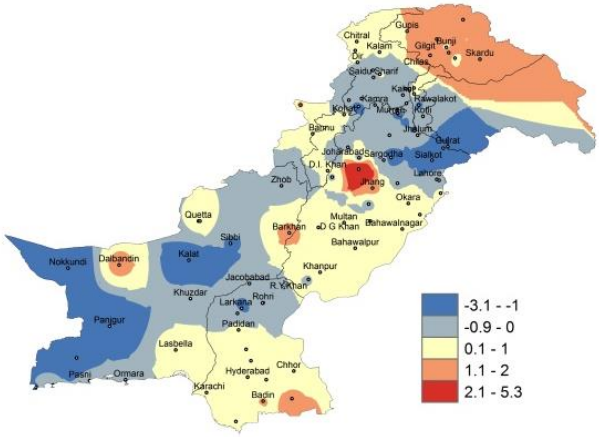
Rainfall reported as 12.0mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 37%. Mean day temperature was 35.4°C while night temperature recorded as 21.1°C with 108.4hours bright sunshine duration. Wind speed recorded as 5.5km/hr with mean wind direction *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 in "°C"

2(b) Past Weather for Sub-Regional Agricultural Plains (21st to 31st July, 2016)

2.6 Jhelum

Rainfall reported as 13.5.5mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 75%. Mean day temperature was 35.1°C while night temperature recorded as 21.7°C with 74.2hours bright sunshine duration. Wind speed recorded 5.4km/hr with wind direction *south westerly.*

2.7 Lahore

Rainfall reported as 51.9mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 70%. Mean day temperature was 35.2°C while night temperature recorded as 26.6°C with 52.4hours bright sunshine duration. Wind speed recorded as 3.5km/hr with mean wind direction *south easterly*.

2.8 Sargodha

Rainfall reported as 161.1mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 76%. Mean day temperature was 34.8°C while night temperature recorded as 26.3°C with 75.3hours bright sunshine duration. Wind speed recorded 4.1km/hr with mean wind direction *easterly.*

2.9 Multan

Rainfall reported as 14.4mm during the decade; however weather remained cloudy for 09days. Average relative humidity recorded as 59%. Mean day temperature was 39.2°C while night temperature recorded as 29.6°C with 99.3hours bright sunshine duration. Wind speed recorded 5.4km/hr with mean wind direction *south westerly.*

2.10 Khanpur

Rainfall reported as 1.2mm during the decade. However sky remained cloudy for 04days. Average relative humidity recorded as 55%. Mean day temperature was 55°C while night temperature recorded as 28.3°C with 109.3hours bright sunshine duration. Wind speed recorded 5.0km/hr with mean wind direction *south westerly.*

2.11 Sakrand

Dry weather reported during the decade; however weather remains cloudy for 02days. Average relative humidity recorded as 54%. Mean day temperature was 38.9°C while night temperature recorded as 27.5°C with 110.7hours bright sunshine duration. Wind speed recorded 5.7km/hr with wind direction *south easterly*.

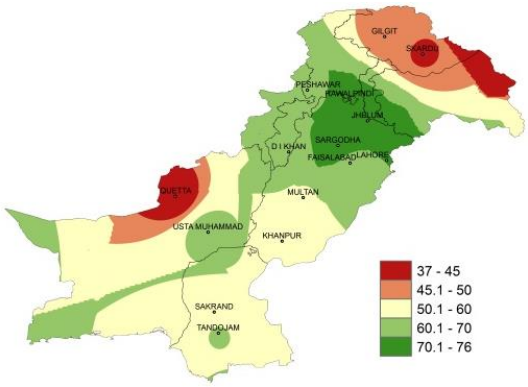


Figure.3: Relative Humidity in Percentage (%)

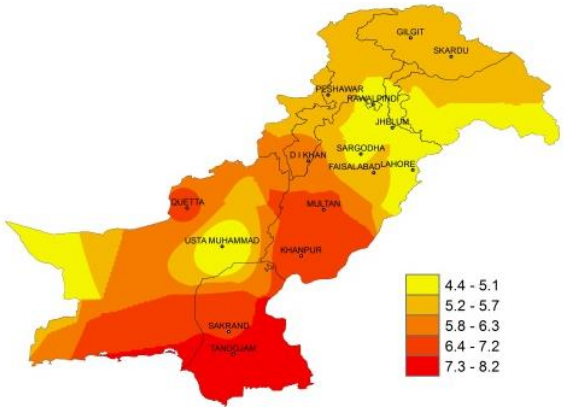


Figure.4: Reference Crop Evapotranspiration "ETo" in mm/day

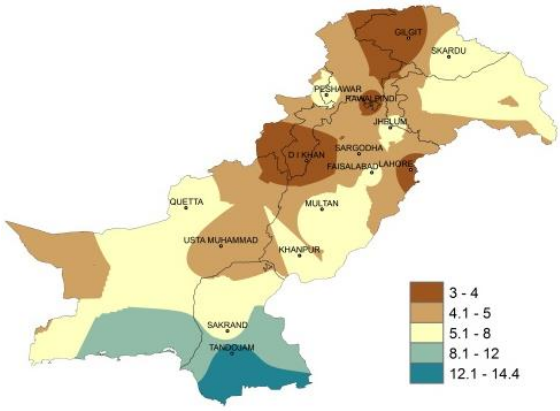


Figure 5: Wind Speed in kilometer per hour (km/h)

2.12 D.I. Khan

Dry weather reported during the decade; however weather remains cloudy for 05days. Average relative humidity recorded as 66%. Mean day temperature was 37.2°C while night temperature recorded as 26.8°C with 77.9hours bright sunshine duration..

2.13 Peshawar

Rainfall reported as 20.0mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 67%. Mean day temperature was 36.1°C while night temperature recorded as 26.7°C with 79.3hours bright sunshine duration. Wind speed recorded as 5.2km/hr with mean wind direction *north easterly*.

2.14 Skardu

Rainfall reported as 3.4mm during the decade; however weather remained cloudy for 07days. Average relative humidity recorded as 44%. Mean day temperature was 31.4°C while night temperature recorded as 14.8°C with 75.2hours bright sunshine duration. Wind speed recorded as 5.7km/hr with mean wind direction *south south-easterly*.

2.15 Gilgit

Rainfall reported as 3.0mm during the decade; however weather remained cloudy for 11days. Average relative humidity recorded as 42%. Mean day temperature was 35.7°C while night temperature recorded as 18.4°C with 104.1hours bright sunshine duration. Wind speed recorded as 3.4km/hr with mean wind direction *Easterly*.

3. Ten Days Weather Advisory for Farmers (1st to 10th August, 2016)

3.1 Temperature Forecast

Temperatures are likely to be normal 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**: Rain-thunderstorm is expected at isolated places in upper Punjab, Rawalpindi, Gujranwala, Sargodha, and Faisalabad during the decade.
- **Khyber Pakhtunkhwa**: Rain-thunderstorm is expected at scattered places in Khyber-Pakhtunkhwa, Mardan, Malakand, Hazara and Peshawar Division during the decade.
- **Sindh:** Mainly hot and dry weather is expected in most parts of the province with the possibility of light rain along Sindh-Makran coast. Light rainfall is expected at isolated places including Hyderabad, Karachi, Mirpur Khas and Larkana divisions during the start of the decade.
- **Balochistan:** Mainly hot and dry weather is expected in most parts of Balochistan, however light rainfall is expected at isolated places in Kalat, and Zhob divisions during the start of the decade.
- **Gilgit Baltistan:** Rain-thunderstorm is expected at isolated places in GB in the end of the decade.
- **Kashmir:** Rain-thunderstorm is expected at isolated places including Muzaffarabad, Kotli, Neelum & Rawalakot during the decade.

3.4 Advisory for Farmers

- Farmers obtaining crop water through tube wells are advised to schedule the irrigation according to the expected weather mentioned during the decade.
- Farmers are advised to control further weeds growth at the present growing stages to stop any negative impact over the crops. Weeds removing practices should be started soon after expected rains in the mentioned.
- Farmers are advised to take in time precautionary measures to protect their crops, livestock and other property from any expected heavy rains.
- Pest/viral attacks are expected over cotton and sugarcane crops during hot and humid conditions during monsoon. Farmers should be very careful and take in time precautionary measures in this regard.
- Stagnant water due to heavy monsoon rains is fatal for standing crops like cotton. Farmers should take suitable measures to resolve the issue.

Normalized Vegetation Index (NDVI) during the period 1-10th July 2016

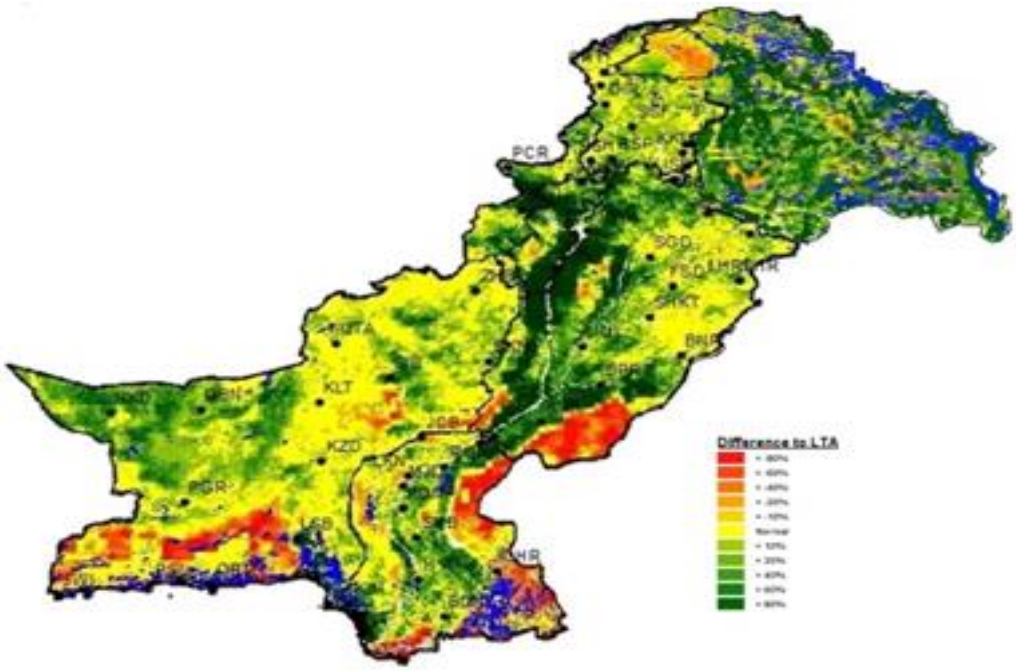


Figure 6: NDVI 1-10th July, 2016

NDVI data show (Figure 6) higher values over agriculture plains of KPK, Kashmir, Punjab and plains around Indus river belt in Sindh depicting normal growing conditions of standing corps in these areas.

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)