

Monthly Agromet Bulletin
National Agromet Centre
Pakistan Meteorological Department



Vol: 9-2021

SEPTEMBER 2021

Highlights...

- ❖ Mostly heavy rainfall were recorded in the agricultural plains of the upper parts of Punjab and above normal rainfalls were recorded in Sindh while below normal rain was reported in rest of the country.
- ❖ Thermal regime in this month remained normal to slightly above normal in most of the agricultural plains of the country during the month.
- ❖ ETo mostly remained normal to above normal and R.H exhibits mostly below normal in the agricultural plains of the country.
- ❖ Agricultural-Soils observed normal trend in most of the agricultural plains, which indicates satisfactory soil moisture conditions.
- ❖ Spraying of chemicals on cotton and sugarcane, picking of early grown cotton varieties and removal of weeds from cotton and other crops were the major field operations in most of the agricultural areas of the country.
- ❖ The present hot and humid atmosphere is very favourable for pest and viral attack/rapid weeds growth in standing crops like cotton, sugarcane and maize. Farmers should be very careful in this regard to take in time precautionary measures for their control.

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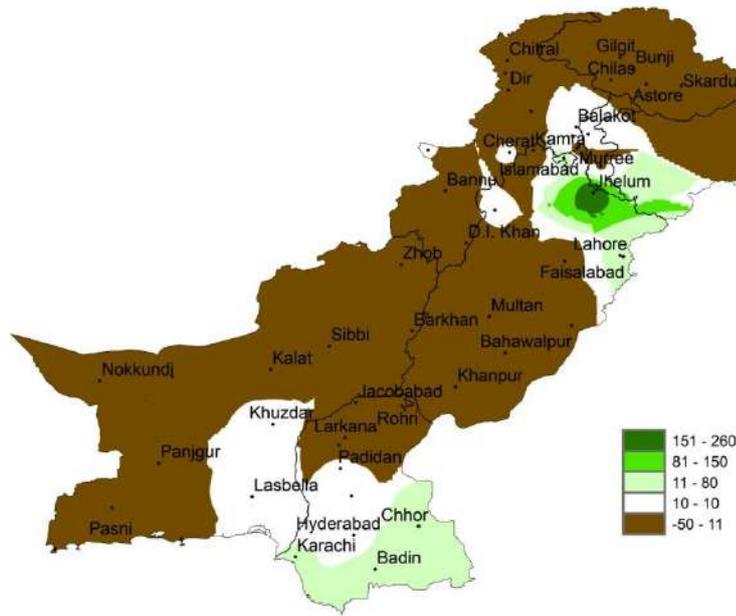
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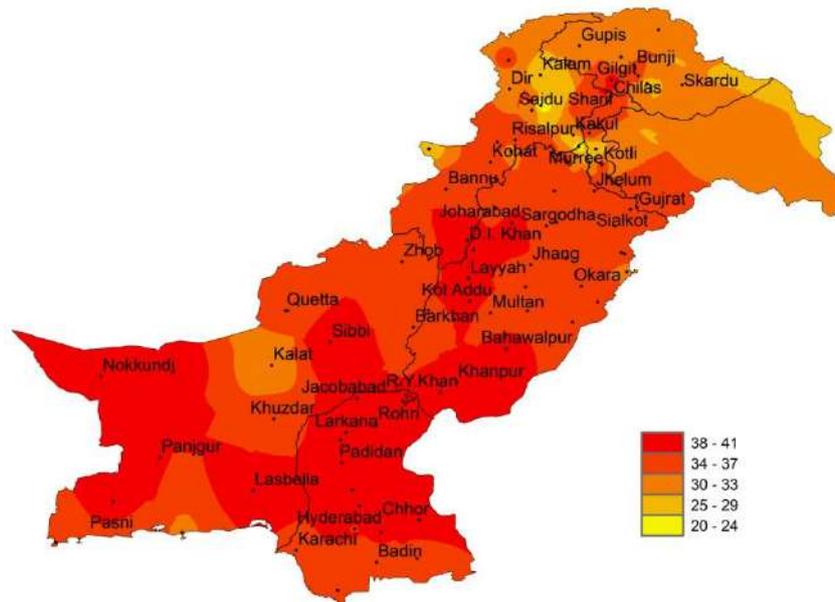
EXPLANATORY NOTE

1. This Agrometeorological bulletin is prepared on the basis of data from 15 stations of Pakistan Meteorological Department (PMD). These stations, selected in consultation with the agricultural authorities, represent major agricultural areas of the country. There are still important agricultural areas which are not represented by the stations included in the bulletin. This may be (a) because there are no PMD stations in these areas and /or (b) the fact that we had to limit the number of stations due to the requirement of speedy data communication and processing (both of which are important for producing and dispatching timely Agrometeorological bulletins).
2. Due to the above, all inferences and conclusions hold true primarily for the above areas and not for Pakistan territory which include areas that may not be very important from the agricultural point of view and the climate of which may not bear directly on agriculture in the major producing areas.
3. The normally expected weather of next month is prepared on the basis of premise of normal or near normal weather prevailing during the coming month. As such it should not be confused with synoptic weather of the next month.
4. Summer Season/ Kharif remains from April/May to October/November and Rabi season from November to April. Mean Daily Maximum Temperature images are included in summer and Daily Mean Minimum Temperature images are included in winter in the Bulletin.
5. In the tables, the values in the parentheses are based on 1981 to 2010 normal. Normal values (in parenthesis) of Soil Temperatures are based upon 10 years data. Dotted line (---) means missing data. Solar radiation intensities are computed from sunshine duration using co-efficients developed by **Dr.Qamar-uz-ZamanChaudhry** of Pakistan Meteorological Department.

Rainfall Departure from Normal (mm) during September, 2021



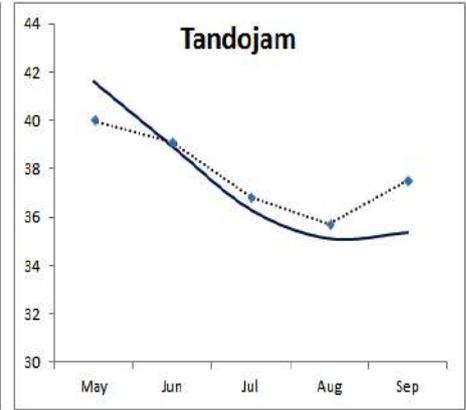
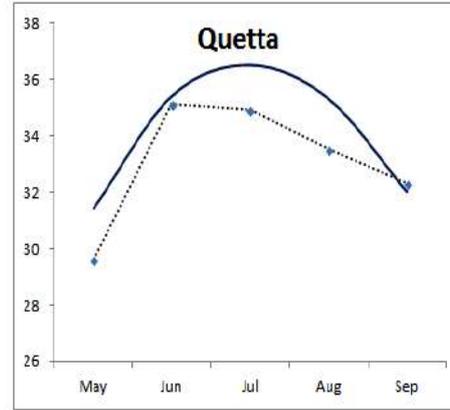
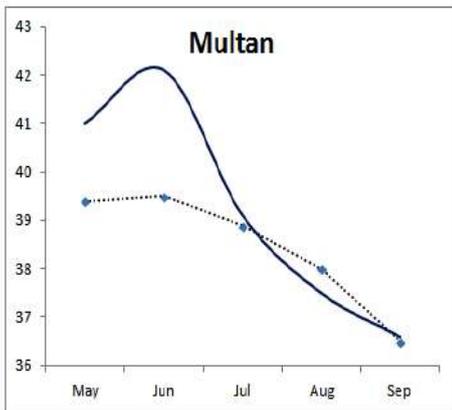
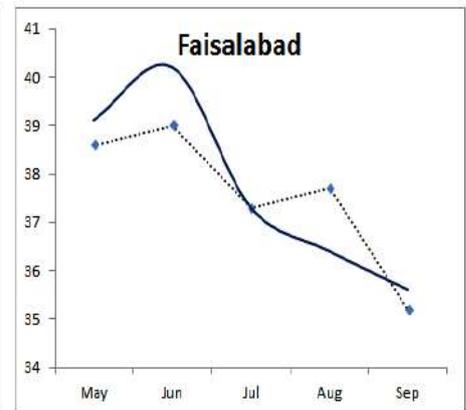
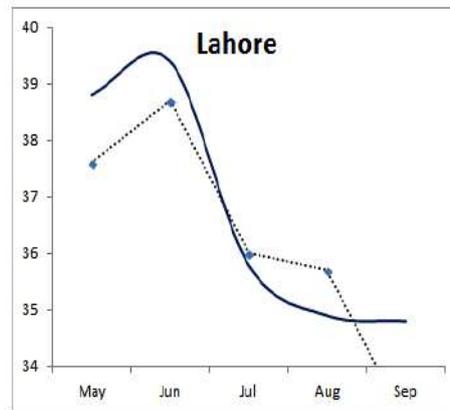
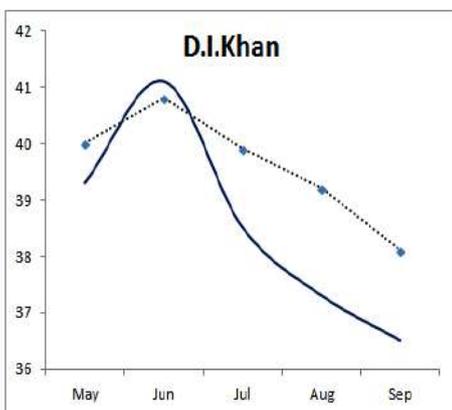
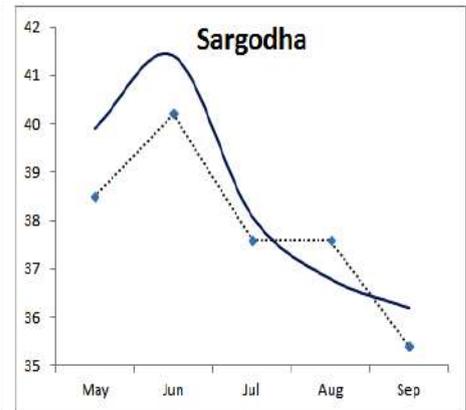
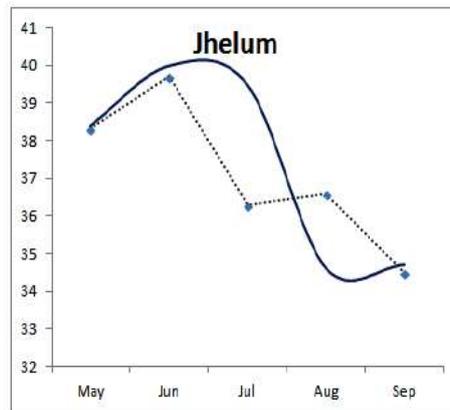
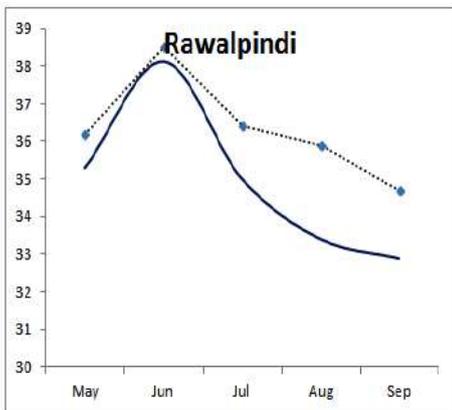
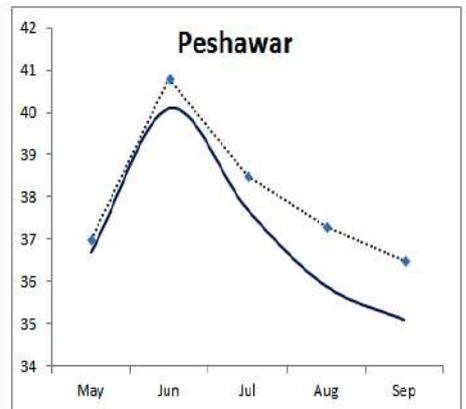
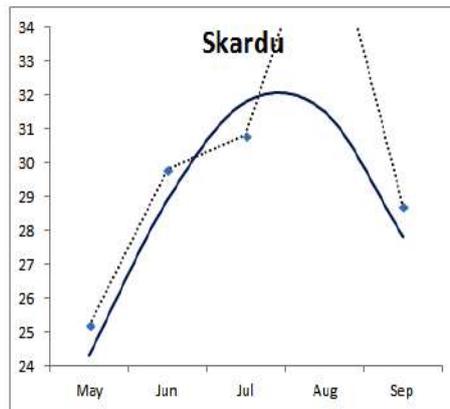
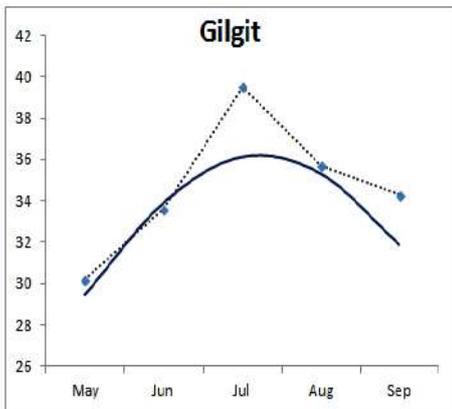
Maximum Temperature (°C) during September, 2021



Maximum Temperature (°C) during Kharif Season (September-2021)

Dotted Curve: Current Season (September-2021) in °C

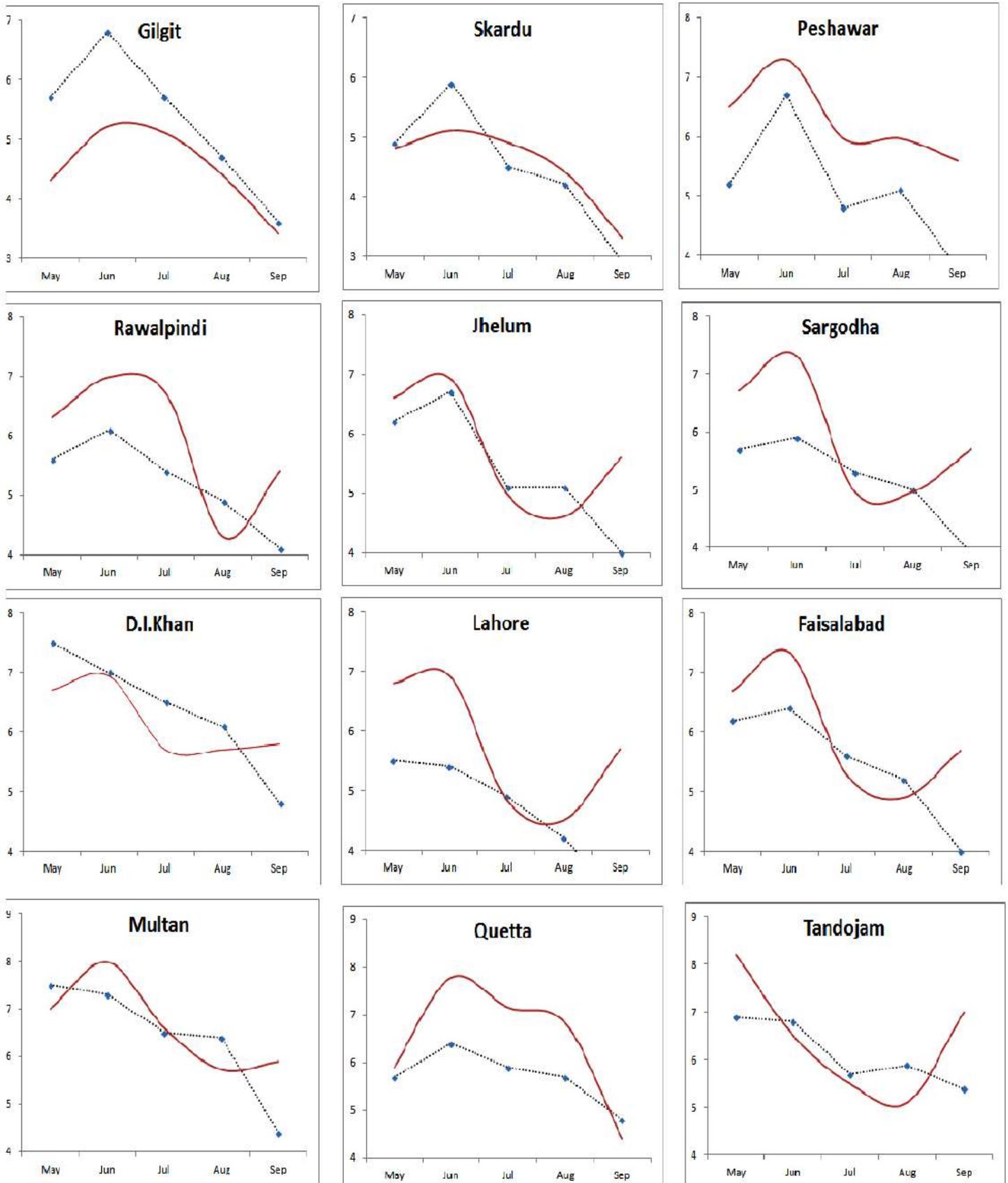
Smooth Curve: Normal values of Kharif Season



Evapotranspiration (mm/day) during Kharif Season (September-2021)

Dotted Curve: Current Season (September-2021)

Smooth Curve: Normal values of Kharif Season



Crop Report during September, 2021

Spraying of chemicals on cotton and sugarcane, picking of early grown cotton varieties were the major field operations in most of the agricultural areas of the country. Some farmers have started land preparation for sowing Rabi crops specially on fallow lands and sowing of winter vegetables was also in progress during the month.

In **Punjab**: Major crops in Punjab are cotton, rice and sugarcane. The growth and development of cotton crop has been observed/reported satisfactory. Mild attacks of White fly; boll worm and thrips have been reported in different parts of the province. The spray operations are in progress to control these pest attacks. Opening and picking of cotton crop has been started in the province. Condition of rice crop is reported satisfactory and harvesting of early grown varieties has been started. Sowing of maize (autumn) has been completed. Germination and growth of the crop is reported satisfactory. Condition of sugarcane crop is reported satisfactory. However mild attacks of borer reported in some areas of central Punjab. Sowing of pulses and winter vegetables has been started.

In **Sindh**: Growth of cotton crop is reported in normal condition. Picking of the crop is in progress in different areas. Condition of rice crop is reported satisfactory and harvesting of early grown varieties of rice crop has been started in some areas. Sowing and early growth of sunflower is reported satisfactory. Growth of sugarcane is also reported satisfactory. Some pest's attacks have also been reported on sugarcane but overall condition of the crop is reported satisfactory in different areas. Sowing of winter vegetables has been started in the province.

In **Khyber Pakhtunkhwa**: Growth and development of all standing crops reported above normal due to satisfactory rains in the province during monsoon up to September. Major standing crops during the month were sugarcane and maize. The growth of both crops was reported above normal due to satisfactory atmospheric conditions. Condition of Sugarcane crop is reported well. Maize is at grain formation stage in most parts and harvesting of early grown varieties has been started in the lower and central plain areas. Rice crop is also reported satisfactory and is growing at grain filling stage and is in healthy condition. Overall condition of orchards is reported satisfactory in the province. Sowing of winter vegetables is in progress.

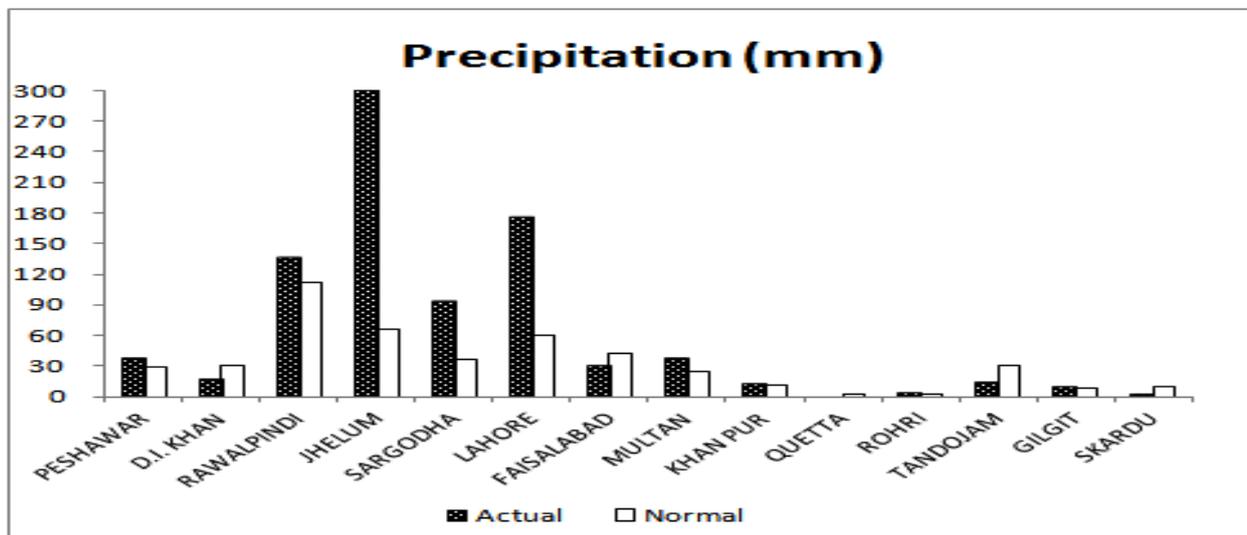
In **Balochistan**: Condition of standing crops like cotton, sunflower, maize and orchards is reported satisfactory. Marketing of local fruits and vegetables is in progress.

In **Gilgit Baltistan**: The main crops in the area are maize and lobiya. Both these two crops are growing normally. Condition and yield of orchards and summer vegetables are also reported satisfactory.

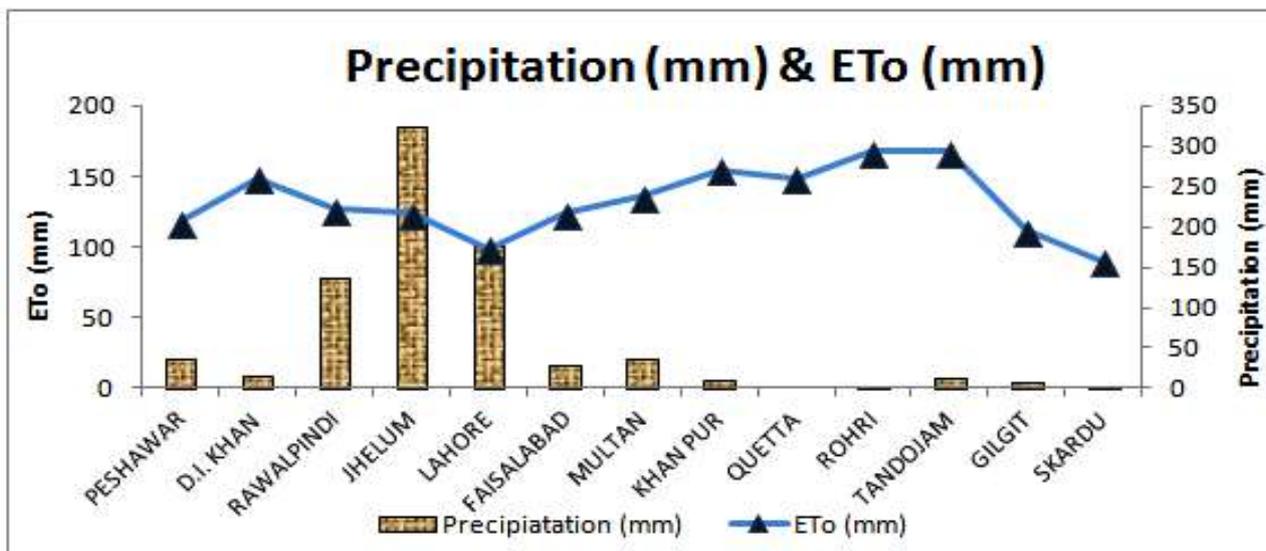
Moisture Regime during September, 2021

September is the last month of monsoon rains in Pakistan. Monsoon weather systems remain active till the mid of this month. These monsoon weather systems along with westerly waves penetrate mostly in the upper half of the country and cause rainfall of light to moderate intensity in this month. However, in this September, mostly heavy rainfall were recorded in the agricultural plains of the upper parts of Punjab and above normal rainfalls were recorded in Sindh while below normal rain was reported in rest of the country.

The highest amount of rainfall reported in the month was 323mm in Jhelum followed by 282mm in Kasur, 253mm in Chaklala, 222mm in Islamabad, 201mm in Mangla and 185mm in Kakul and Sialkot. Number of rainy days recorded in agricultural plains of the country reached up to 15. Maximum number of rainy days was recorded (15 days) in Sialkot followed by 10 days in Islamabad, Lahore, Bagrote, Skardu and Kakul each and 09 days in Kasur, Murree, Gujranawala, Astore and Gilgit each.

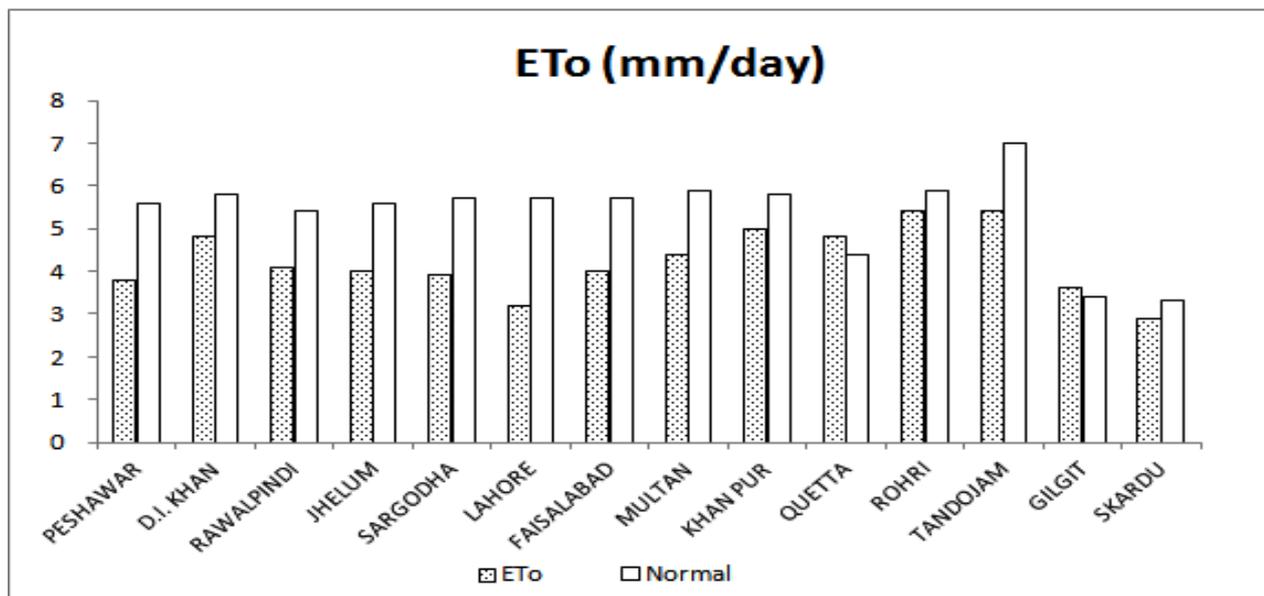


Comparison of Actual Precipitation (mm) during the month of September, 2021 with Normal values



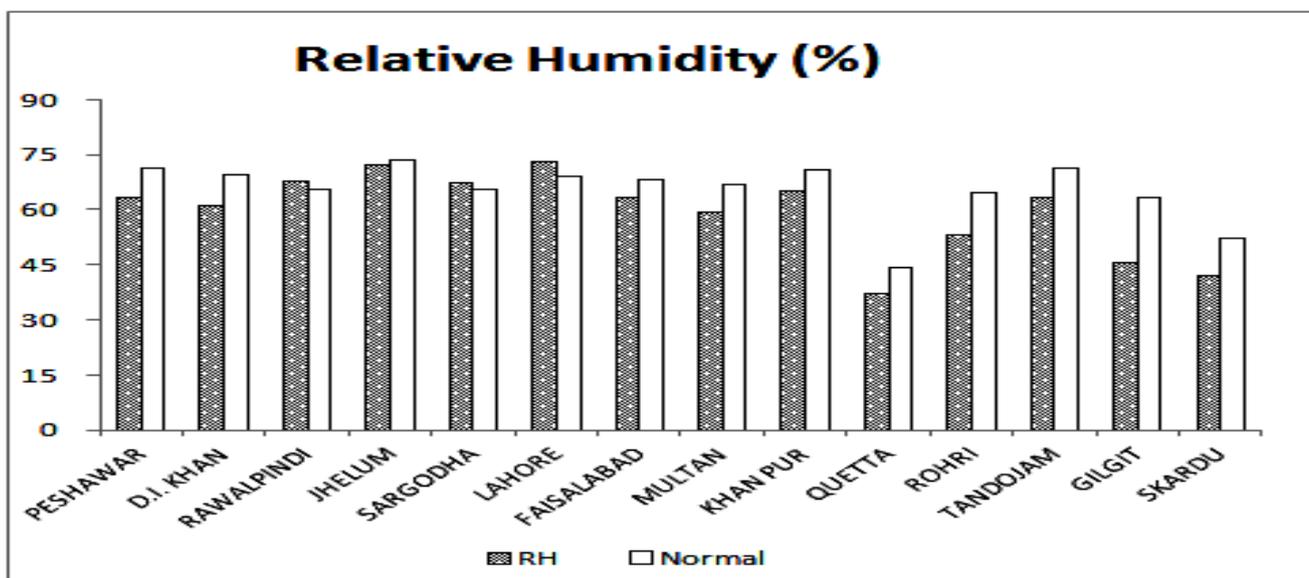
Precipitation (mm) & ETo (mm) during the month of September, 2021

The evaporative demand of the atmosphere represented by reference crop evapotranspiration (ET_o) remained below normal in most of the agricultural plains of the country. The highest value of ET_o was estimated in Rohri and Tandojam.



Comparison of Actual ET_o (mm/day) during the month of September, 2021 with Normal values

The mean daily Relative Humidity (R.H) remained normal to below normal in most of the agricultural plains of the country except Eastern Punjab where R.H observed above normal due to heavy rains reported in these areas. Maximum value of mean Relative humidity was observed 70% at Lahore, followed by 65% at Rawalpindi and 63% at Jhelum. Maximum number of days with mean R.H greater or equal to 80% was observed for 02 days at Lahoe.



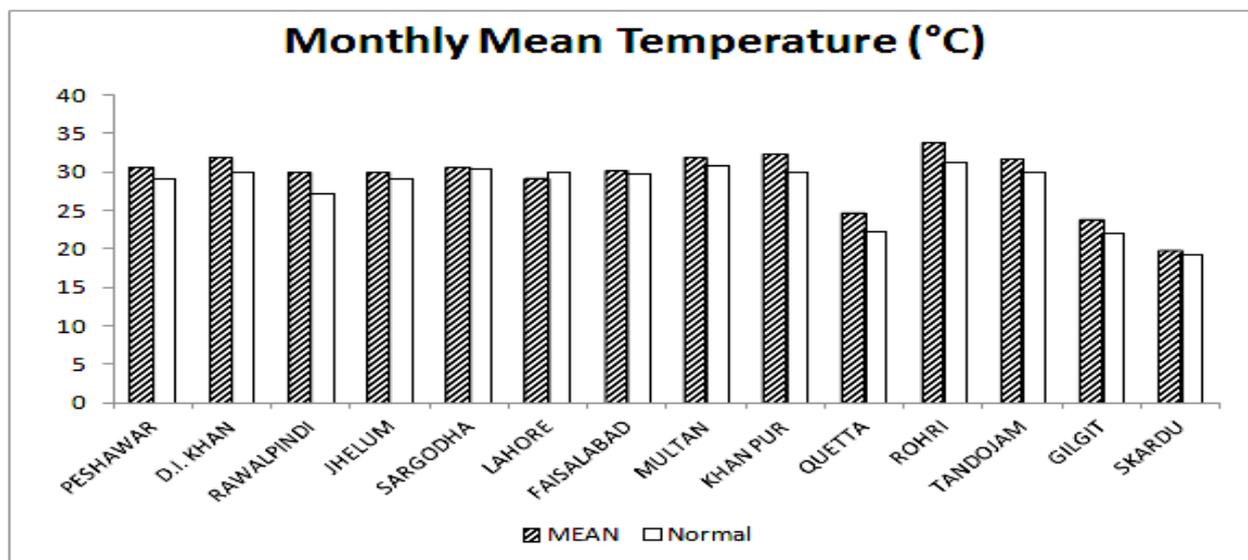
Comparison of Actual Relative Humidity (%) during the month of September, 2021 with Normal values

From overall analysis of the whole monsoon season of this year it is evident that satisfactory rains were reported in all agricultural plains of the country during this season. However the moisture stress has almost finished and sufficient moisture is available in the atmosphere producing favorable conditions for the coming Rabi crops especially at sowing time. Farmers of follow lands should utilize the present soil moisture for sowing wheat especially in upper half of the country.

Temperature Regime during September, 2021

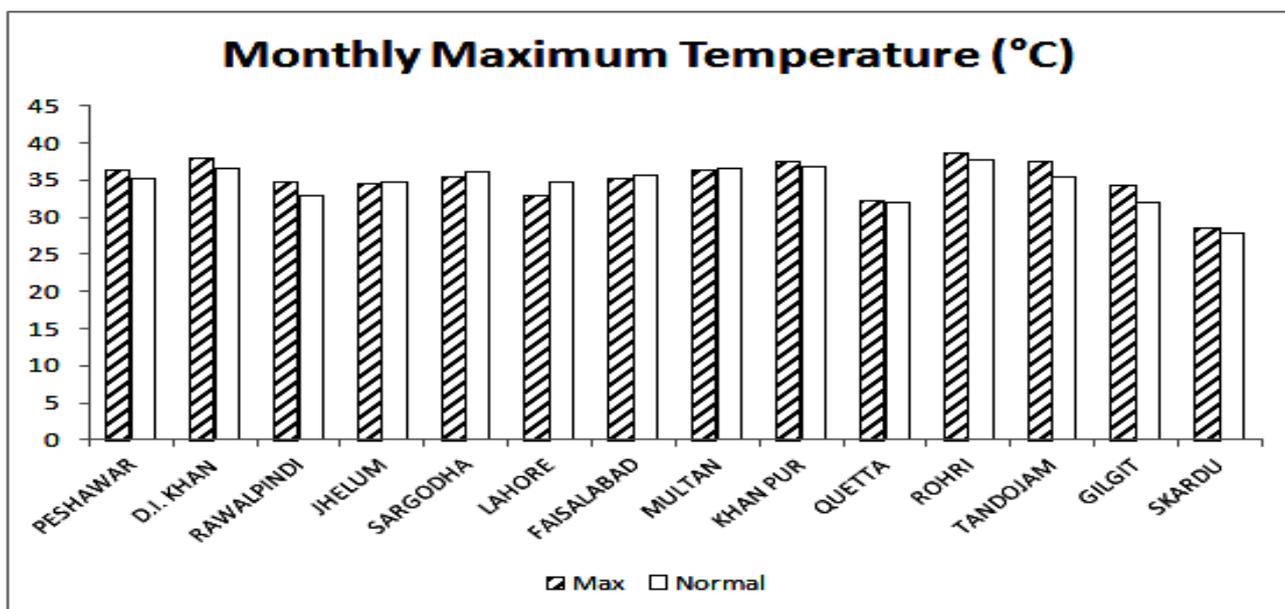
Temperature plays vital role in the growth and development of crops. Thermal regime in this month remained normal to above normal in most of the agricultural plains of the country.

Mean daily temperature ranged 30 to 31°C in Khyber Pakhtunkhwa, 29 to 30°C in Potohar plateau, 29 to 31°C in remaining parts of Punjab, 30 to 33°C in agricultural plains of Sindh, 17 to 21°C in Gilgit Baltistan region and it was observed 23°C in the high elevated agricultural plains of Baluchistan represented by Quetta valley.



Comparison of Actual Mean Temperature (°C) during the month of September, 2021 with Normal values

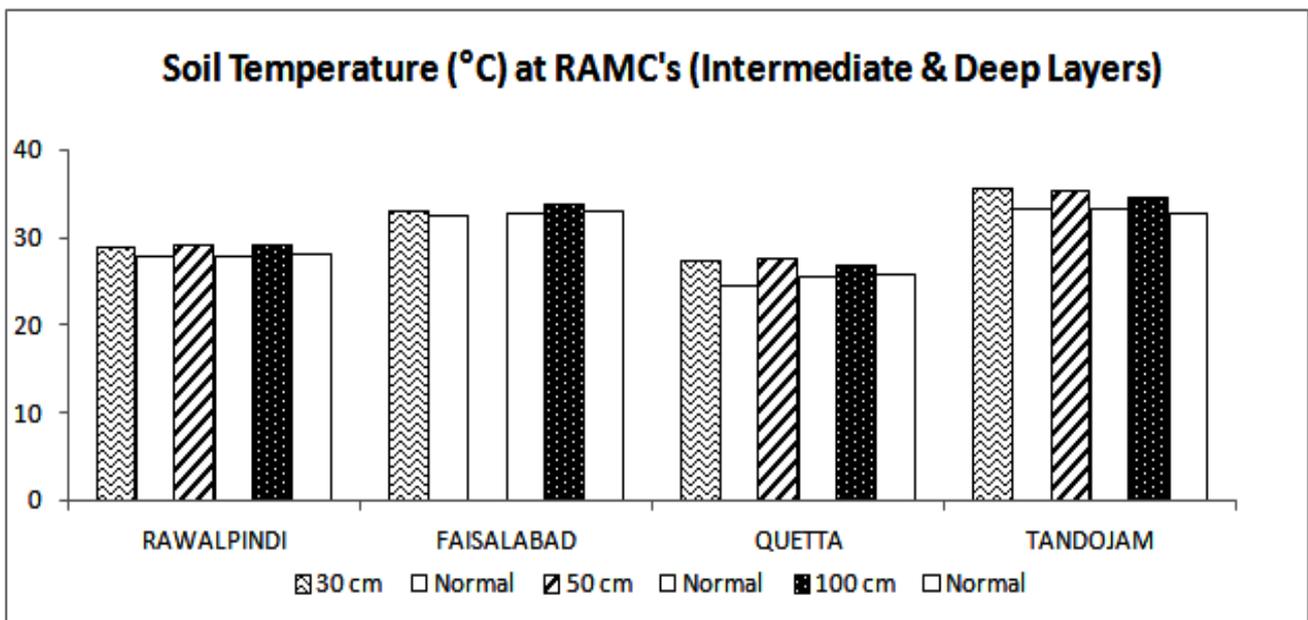
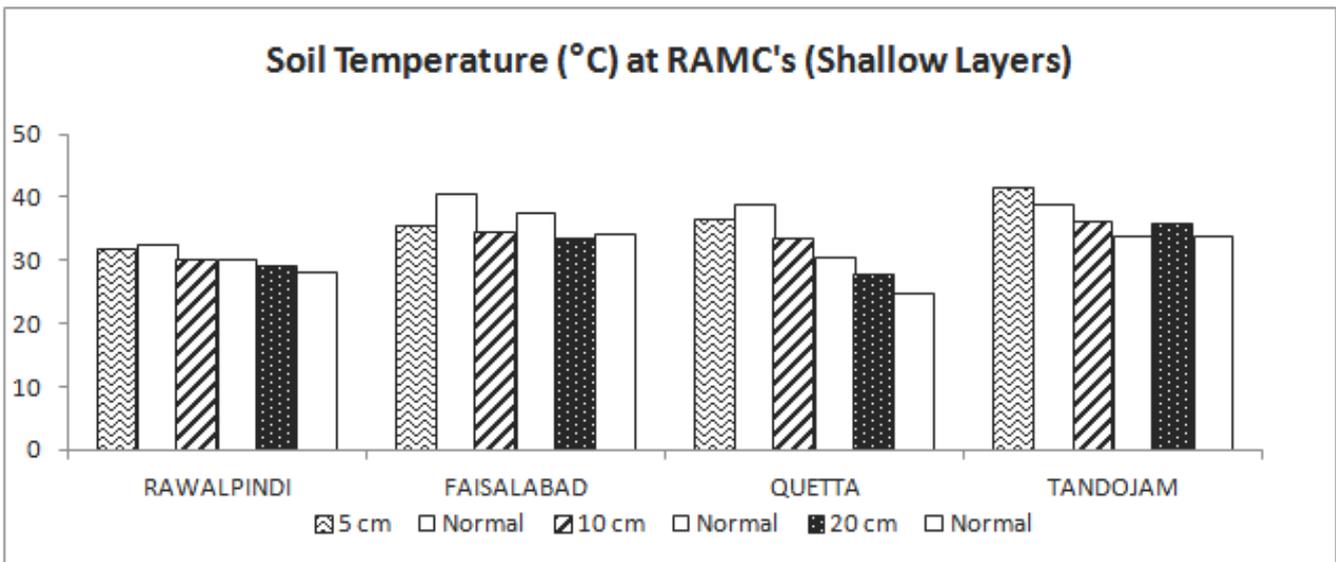
The day time temperature represented by mean maximum also remained above normal by 1-2°C in the agricultural plains of KP, Sindh and GB and observed normal in Punjab. The highest maximum temperature in the agricultural plains of the country was recorded 41°C at Turbat. Number of stress days with maximum temperature greater or equal to 40°C and R.H. less than or equal to 30% was observed 02 days at Rohri.



Comparison of Actual Maximum Temperature (°C) during the month of September, 2021 with Normal values

Agricultural soils showed mostly normal to cooler trend in most of the agricultural plains of the country. However soil temperature observed normal to below normal in Potohar region. Significant rise was observed lower Sindh represented by Tandojam.

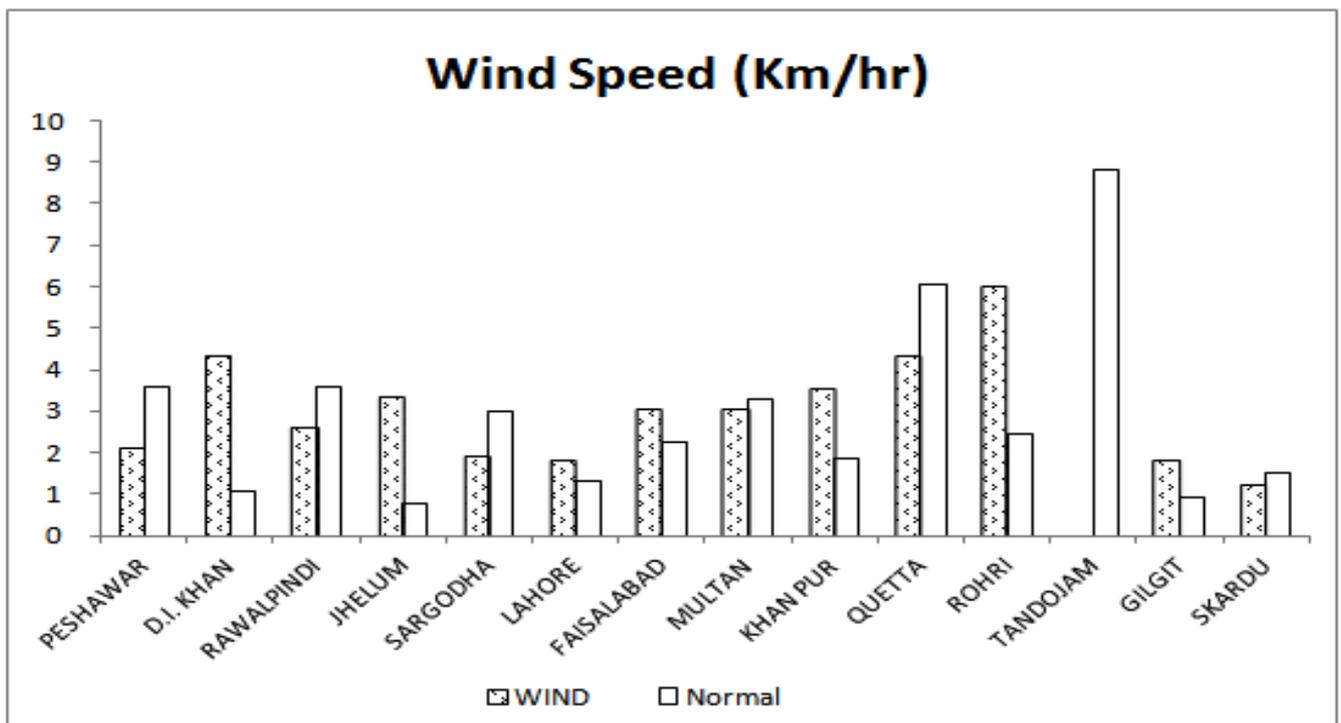
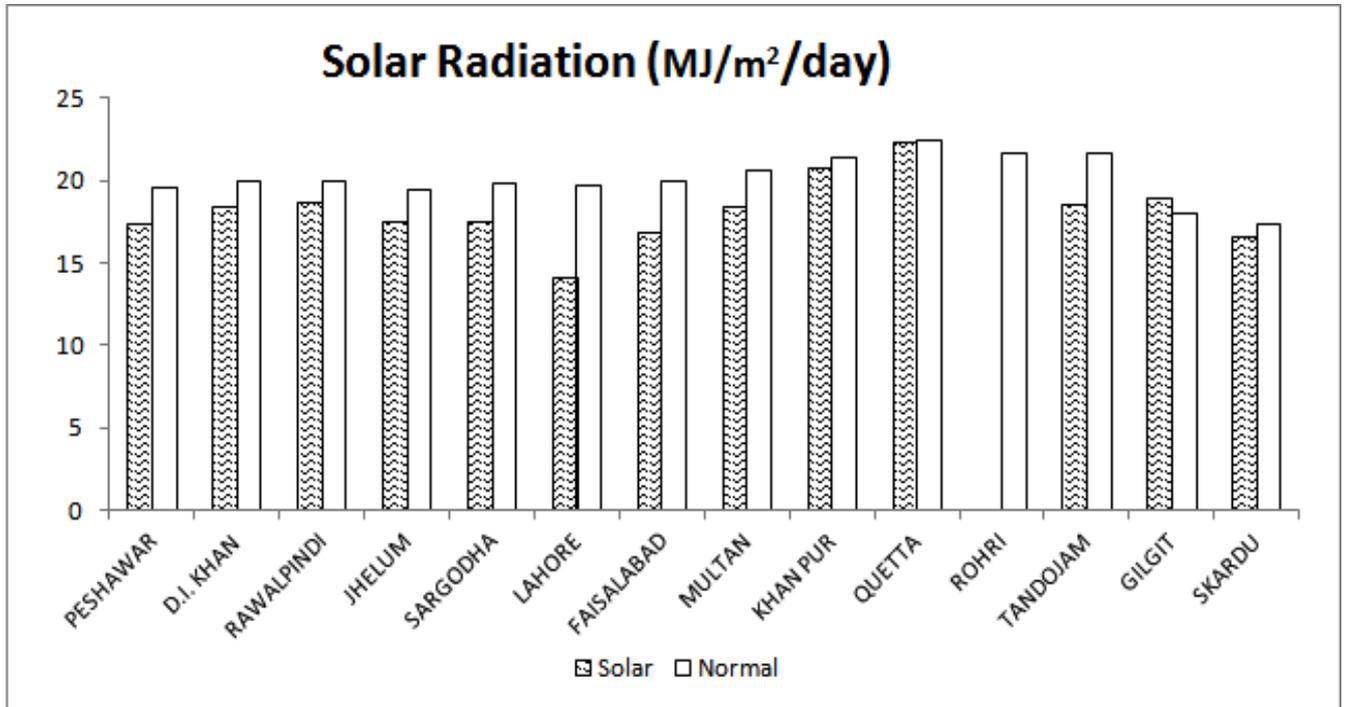
From the general analysis of soil behavior in this month, it is concluded that moisture has penetrated more in deep layers at potohar region and central Punjab as compared to lower parts of the country due to comparatively less rainfall reported during the month. However, overall condition of moisture content is satisfactory for sowing of coming wheat and other seasonal crops and vegetables especially in rainfed areas of the country. Therefore farmers are advised to cultivate Rabi crops well in time so that soil moisture stored due to monsoon rains in September may be fully utilized especially in northern rainfed areas of the country.



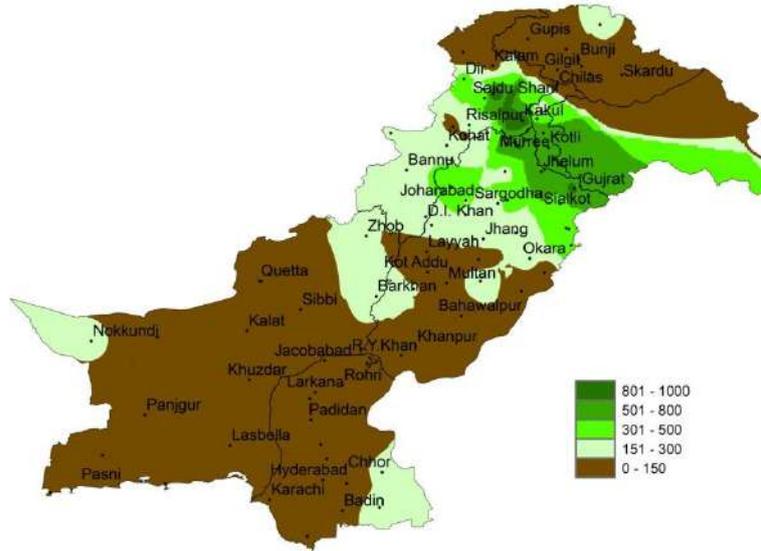
Comparison of Actual Soil Temperature (°C) at RAMCs during the month of September, 2021 with Normal values

Solar Radiation and Wind Regime during September, 2021

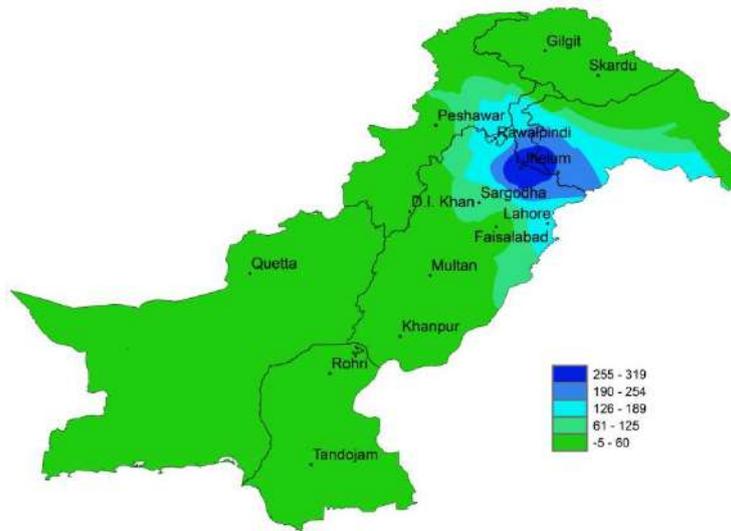
Total bright sunshine hours and solar radiation intensity remained normal to below normal in most of the agricultural plains of the country. Mean wind speed throughout agricultural plains of the country ranged between 1to 7km/h with North-east to North-west and South trend. Maximum wind speed was rounded to 7 km/h observed at Rohri in Sindh.



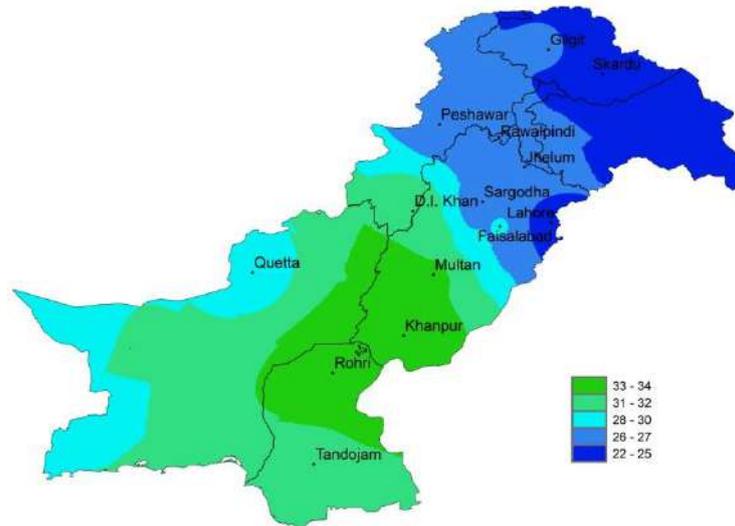
Cumulative Rainfall (mm) for Kharif Season (May to September)



Cumulative ETo (mm/day) for Kharif Season (May to September)



Cumulative Water Stress (rain-ETo) for Kharif Season (May to September)



Normally Expected Weather during October, 2021

October is the transition month between the summer and winter weather systems. In general, October is considered as the driest month of the Rabi season. However, a few falls of light and moderate rain are expected over northern Balochistan, upper divisions of Khyber Pakhtunkhwa, submountainous areas of Punjab and Kashmir due to incursion of moisture from the westerly troughs. Quantitatively, northern Punjab and Khyber Pakhtunkhwa is expected to receive 30 to 100 mm of rainfall. Rest of the country would remain practically dry as amount of rainfall is not likely to exceed 10 mm.

The probability of occurrence of rainfall is given below:

Amount / Dates	PERCENTAGE PROBABILITY OF OCCURRENCE OF DIFFERENT AMOUNTS OF RAINFALL IN OCTOBER					
	1-5	6-10	11-16	17-20	21-25	26-30,G
10mm	16	16	18	18	9	9
15mm	12	9	14	10	1	5
25mm	6	6	5	4	0	3

The mean daily relative humidity may range between 45% and 55% during the month. Over high agricultural plains of Balochistan, it may be around 35%. In general, the mean relative humidity all over the country would be 10% less than September except high agricultural plains of Balochistan, where it is expected to be slightly higher.

Despite the shorter days, cooler atmosphere and less intense solar radiation, evaporative demand of the atmosphere is expected to maintain the level of September values. The reasons are the clearer skies and drier atmosphere during October, relative to September. The ETo values are expected to range between 4.0 and 5.5 mm/day over most parts of Khyber Pakhtunkhwa, Punjab and Southern Balochistan. It would be close to 3.5 mm/day over high agricultural plains of Balochistan. It may exceed 6 mm/day over Sindh.

The mean daily temperatures are expected to drop about 3 to 5°C relative to September. They may range 22 to 26°C over most of Punjab and Khyber Pakhtunkhwa. However, it may exceed 30°C in Sindh whereas in high agricultural plains of Balochistan, it would be close to 15°C. The mean maximum temperatures are expected to range between 31 and 37°C. They are expected to be around 25°C in Quetta. Maxima may exceed 40°C at few places mainly in southern Punjab, upper Sindh and adjoining Balochistan. Mean daily minimum temperatures are expected to range between 14°C and 22°C except in high agricultural plains of the country. High agricultural plains of Balochistan are expected to experience few freezing nights towards the end of the month.

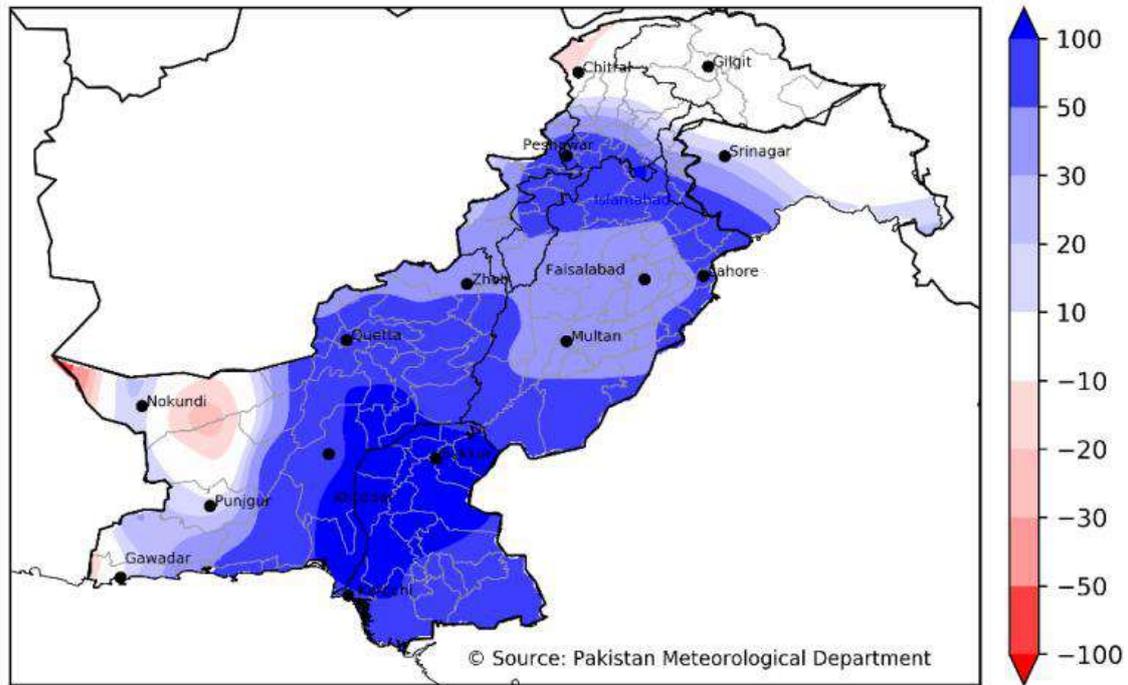
The numbers of bright sunshine hours are expected to range between 9 hours a day in north to 10 hours a day in south. Besides lower solar angle, there will be slight increase in bright sunshine duration relative to last September due to clearer skies during October. The intensities of solar radiation are expected to range between 17 and 20 MJ/M²/day throughout the country.

During October, mean wind speeds are expected to remain below 10 Km/hour over most of agricultural areas of the country. It is expected that prevailing southerly wind flow may shift to northwesterly direction. Following is the water requirement of full canopied healthy crops in different regions of the country during October:

S. No	Region	Water Requirement	
		(mm)	Cubic Meter/Hectare
1	Northern Punjab, Northern Khyber Pakhtunkhwa and high agricultural plains of Balochistan	110-120	1100-1200
2	Southern Khyber Pakhtunkhwa, and Southern Punjab	140-160	1400-1600
3	Sindh and Southern Balochistan	180-190	1800-1900

Outlook for October 2021

Monthly Rainfall Departure (%) Oct 2021



A tendency of above **normal** precipitation is predicted over the country during the forecast month.

Gilgit Baltistan, North-western Balochistan and Southern Punjab are expected to receive near normal rainfall whereas Upper Punjab, central Khyber Pakhtunkhwa, Azad Kashmir, Sindh and coastal region of Balochistan will receive highly above normal rainfall.

The cyclonic activity developed during the last week of September may cause heavy rainfall during the first week of October over the coastal belt of Sindh and Balochistan.

اکتوبر 2021ء میں کاشتکاروں کیلئے زرعی موسمیاتی مشورے

اس سال ماہ ستمبر میں مون سون بارشیں اسلام آباد سمیت پوٹھوار، شمال مشرقی پنجاب، سندھ اور بلوچستان کے ساحلی علاقوں میں معمول سے زیادہ ہوئیں جبکہ وسطی و زیریں پنجاب، خیبر پختونخواہ اور گلگت بلتستان میں معمول سے کم ہوئیں۔ رنج کی کاشت کا آغاز وسط اکتوبر سے ہو جائے گا۔ ستمبر کے آخر تک ہونے والی بارش کی کمی اگر زمین میں مناسب طریقے سے محفوظ کر لی گئی ہو تو یہ فصل رنج کی کاشت اور اسکی ابتدائی نشوونما کیلئے انتہائی سازگار حالات پیدا کرے گی۔ اکتوبر اور نومبر کے موسمیاتی حالات کو مد نظر رکھتے ہوئے رنج کی فصل سے اچھی پیداوار کیلئے موزوں منصوبہ بندی کرنا وقت کی اہم ضرورت ہے۔ اس ضمن میں کسانوں کیلئے مندرجہ ذیل زرعی موسمیاتی مشورے بہت اہم ثابت ہو سکتے ہیں۔

۱۔ رنج کی فصلوں کی بوائی کا آغاز اکتوبر کے وسط سے شروع ہو گا۔ گندم اس موسم کی اہم ترین فصل ہے۔ بہترین پیداوار حاصل کرنے کیلئے ضروری ہے کہ گندم کی کاشت نومبر کے وسط تک بہر صورت مکمل کر لی جائے تاکہ مطلوبہ پیداوار حاصل کرنے کیلئے فصل کو پورا وقت مل سکے۔

۲۔ بارانی علاقوں کے کسان موجودہ وٹر کو استعمال کرتے ہوئے بہترین پیداوار حاصل کر سکتے ہیں۔ اس وقت زمینوں میں کم سے کم بل چلایا جائے اور بل چلانے کے بعد سہاگہ ضرور دے دیا جائے تاکہ زمین سے نمی کا ضیاع کم سے کم ہو۔ اگر گندم کی کاشت کیلئے محکمہ زراعت کے تجویز کردہ دورانیے میں کسی روز ۱۰ ملی میٹر یا اس سے زیادہ بارش ہو جائے تو اس وٹر پر کاشت کی گئی فصل کی اگائی بہترین ہوتی ہے۔ مگر بارش کے انتظار میں فصل کاشت کرنے میں ہرگز دیر نہ کریں۔ کیونکہ ابھی زمین میں نمی موجود ہے جو کہ اچھی اگائی کا موجب بن سکتی ہے۔ ایسے بارانی علاقوں میں جہاں زمین میں مناسب حد تک نمی نہیں اور بارش کا بھی امکان نہ ہو ضروری ہے کہ گندم کے بیج کو رات پہلے پانی میں بھگو دیا جائے۔ اور صبح سویرے کاشت کر دیا جائے۔ گندم کے بیج کو بوائی سے پہلے دوائی لگانا ہرگز نہ بھولیں۔

۳۔ محکمہ زراعت مختلف فصلوں کے ساتھ گندم کی مخلوط کاشت کا مشورہ دیتا ہے۔ بیک وقت کھیت میں ایک سے زیادہ فصلوں کا ہونا مخلوط کہلاتا ہے۔ نہری یا زیادہ بارش کے علاقوں میں یہ طریقہ مفید ہے کیونکہ پودوں کیلئے پانی وافر مقدار میں موجود ہوتا ہے۔ کسان اگر بروقت جڑی بوٹیوں کا تدارک پانی اور کھاد کا تناسب مناسب رکھیں تو باغات کے ساتھ گندم اور رنج کی دوسری فصل زیادہ پیداوار کے ساتھ اگائے جاسکتے ہیں۔

۴۔ دھان کی فصل اس وقت پیداوار کے آخری مراحل میں ہے یہ وہ وقت ہے جب چاول کی فصل کو پانی کی اشد ضرورت ہوتی ہے۔ کسان عام طور پر کھیت کو پانی سے لہالب بھر دیتے ہیں یہ ہرگز درست نہیں ہے بلکہ پانی کا ضیاع ہے۔ مناسب مقدار میں کھیت کو پانی دیا جائے تاکہ کئی دنوں تک وہ کھڑا نہ رہے اس کفایت سے حاصل شدہ پانی کو کسی دوسری فصل کو مہیا کر کے اس سے بھی بہتر پیداوار حاصل کی جاسکتی ہے۔

۵۔ موسم برسات میں جاری کردہ مشوروں میں کہا گیا تھا کہ کھیتوں کی وٹ بندی سے گھاس پھوس کو تلف نہ کیا جائے کیونکہ یہ پانی کے بہاؤ کے ساتھ مٹی کے کٹاؤ کو کافی حد تک روکتا ہے۔ اب کھیتوں میں رنج کی کاشت کرنا ہے اور ان گھاس پھوس کے پودوں کو فوری طور پر تلف کر دیا جائے تاکہ زمین میں محفوظ نمی فصل کی کاشت کے کام آسکے۔

۶۔ زراعت کی کامیابی میں موسمیاتی حالات کا بہت عمل دخل ہے اور بہتر حکمت عملی سے غیر موزوں موسمیاتی حالات سے بھی استفادہ کیا جاسکتا ہے۔ محکمہ موسمیات کی پیشگوئی کو ملحوظ خاطر رکھ کر محکمہ زراعت کے ماہرین کی مشاورت سے اپنے معمولات طے کریں تو پیداوار میں خاطر خواہ اضافہ ممکن ہے۔ موسمیاتی حالات سے متعلق مزید معلومات کیلئے محکمہ موسمیات کے قریبی دفتر سے رابطہ کیا جاسکتا ہے۔ جن کا پتہ درج ذیل ہے۔

۱۔ محکمہ موسمیات، نیشنل ایگرو میٹ سٹیٹ، پی۔ او۔ بکس نمبر 1214، سیکٹر ایچ ایٹ ٹو، اسلام آباد۔ فون نمبر: 9250299-051

۲۔ محکمہ موسمیات، نیشنل فور کاسٹنگ سٹیٹ برائے زراعت، پی۔ او۔ بکس، 1214، سیکٹر ایچ ایٹ ٹو، اسلام آباد۔ فون نمبر: 9250364-051

۳۔ محکمہ موسمیات، ریجنل ایگرو میٹ سٹیٹ، نزد بارانی یونیورسٹی، مری روڈ، راولپنڈی۔ فون نمبر: 9292149-051

۴۔ محکمہ موسمیات، ریجنل ایگرو میٹ سٹیٹ، ایوب ریسرچ انسٹیٹیوٹ، جھنگ روڈ، فیصل آباد۔ فون نمبر: 2657047-041

۵۔ محکمہ موسمیات، ریجنل ایگرو میٹ سٹیٹ، ایگر بیلچر ریسرچ انسٹیٹیوٹ، ٹنڈو جام۔ فون نمبر: 766583-0222

۶۔ محکمہ موسمیات، ریجنل ایگرو میٹ سٹیٹ، ایگر بیلچر ریسرچ انسٹیٹیوٹ، سریاب روڈ، کوئٹہ۔ فون نمبر: 9211211-081

تفصیلی موسمیاتی معلومات کیلئے محکمہ موسمیات کی ویب سائٹ www.pmd.gov.pk ملاحظہ فرمائیں۔

Findings of AgMIP Pakistan, University of Agriculture Faisalabad

1. 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)
2. There would be significant variability in rainfall patterns (about 25% increase in summer & 12% decrease in winter during 2040-2069)
3. Climate Change will affect the crop yields negatively (about 17% for rice and 14 % for wheat)
4. 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 ہو سکتا 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 ہو سکتی 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 سدباب (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)