Monthly Agromet Bulletin National Agromet Centre Pakistan Meteorological Department Islamabad

Vol: 01-2015

Highlights...

- Dry weather/below normal precipitation was reported in the country. Dry continental air/foggy atmosphere prevailed over most of the agricultural plains of the country during the month.
- Thermal regime in this month remained mostly normal in the agricultural plains of the country.
- ETo and R.H remained normal to below normal in most of the agricultural plains of the country.
- Agricultural soils showed mostly warmer trend in the country due to consistent dry weather/below normal rains during the winter season.
- Picking/harvesting/crushing of sugarcane, seasonal vegetables and fruit orchids especially citrus and apple were the major field activities in most of the agricultural plains of the country during the month.
- ✤ Farmers are advised to protect standing crops from excess of weeds growth and other diseases. Necessary actions may be taken in time to keep normal growth of the crops.
- Average precipitation is expected over the country during February with higher deficit over eastern parts of the country including eastern Punjab, southern Baluchistan and Kashmir.

JANUARY, 2015

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Pattern-in-Chief: ArifMahmood, Director General, Editor-in-Chief: Dr. Khalid M Malik, Director, Editor: Muhammad Ayaz, Meteorologist Published by: National AgrometCenter (NAMC) P.O.Box:1214, Sector: H-8/2, Islamabad, PAKISTAN Tel: +92-51-9250592, Fax: +92-51-9250362Email: dirnamc@yahoo.com Website: <u>www.pmd.gov.pk</u>



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 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 Pakistan Meteorological Department.



Crop Report during January, 2015

Picking/harvesting/crushing of sugarcane, seasonal vegetables and fruit especially citrus and apple were the major field activities in most of the agricultural plains of the country during the month. Irrigation as per requirement and availability was provided.

In **Punjab:** The growth and development of the crops both in rainfed and irrigated areas has reported satisfactory but somewhat poor due to lack of soil moisture especially in rainfed areas. Recent occurred and coming expected rains will improve this situation in rainfed areas. Wheat crop is reported at tillering/shooting stages. Growth and development of Gram crop has been reported satisfactory. The early sown crop is attaining flowering stage. The growth of oilseed crop is reported satisfactory and the crop is at pod formation while the mid and late sown crop is at flowering stage. Sowing of Masoor crop has been completed. Germination/growth of the crop is reported satisfactory. Harvesting/picking of winter vegetables and fruit (citrus) is in progress and very good yield has obtained this year.

In **Sindh:** Condition of wheat crop is reported satisfactory. The crop is at heading/ flowering stage. Condition of oil seed crops is reported satisfactory. Castor oil and jtropha crops are growing satisfactory at capsule formation stage. Rape mustard is at pod formation stage, safflower and Linseed are at vegetative stage and sunflower at early germination stage. Crushing of sugarcane is in full swing and very good yield is expected in the areas which are not affected by floods. Seasonal fruits like Guava, banana, cheeko are in good condition. Cheeko and apple stone (Bare) are at fruit formation stage. Picking/harvesting of winter vegetables is in progress and good yield is being obtained.

In **Khyber Pakhtoonkhawa:** The growth and development of the crops in irrigated as well as in rainfed areas are reported satisfactory due to satisfactory rains during the month. The condition of wheat crop is reported satisfactory. The crop is growing at shooting/heading stage. The growth of oil Harvesting/crushing of sugarcane crop is in progress and very good yield is reported. The growth of oil seed crops including newly introduced biofuel crop Jtropha is reported satisfactory. Harvesting of winter vegetables is in progress and these are available in the market. Growth of orchid is satisfactory and good yield of citrus has reported.

In **Balochistan:** Condition of standing crops and orchards is reported satisfactory. All varieties of apples have developed colour and picking of the fruit is in progress. Yield of winter vegetables are reported well and these are available in the market.

In **Gilgit Baltistan**: Most of the agricultural activities stop during the winter season in the area. Soil has been prepared for wheat crop to be sown in the coming months.

Moisture Regime during January, 2015

Normally January is a rainy month in winter season in the agricultural plains of the country but during this January rainfall remained normal to below normal over most of the agricultural plains of the country. Dry and cold continental winds prevailed over the country for most of the days during dry weather. The highest amount of rainfall was reported 117mm at Dir followed by 102mm at Malam Jabba, 66mm at Parachinar, 63.1m at Saidu Sharif and 57mm at Lower Dir.

Numbers of rainy days recorded in the country ranged from 1 to 10 days. The maximum number of rainy days in the country was observed 10 at Kalam followed by 08 days at Dir, Malam Jabba each and 06 days at Parachinar, Saidu Sharif and Lower Dir each.



The evaporative demand of the atmosphere represented by reference crop evapotranspiration (ETo) remained normal to below normal in most of the agricultural plains of the country except upper plains of KPK represented by Peshawar, Quetta valley and GB region where it remained above normal. Highest value of ETo was observed 2.9mm/day at Peshawar due to mostly dry weather/clear skies observed during the month in these areas.



The mean daily Relative Humidity (R.H) remained normal to below normal in most of the agricultural plains of the country. Maximum value of mean Relative humidity was observed 78% at Sargodha followed by 77% at Lahore and 73% at Multan & Khanpur each. The minimum value was observed at Quetta due to clear skies and its dry climate in this month. Maximum number of days with mean R.H greater or equal to 80% was observed for 18 days at Rohri, followed by 17 days at Sargodha and 16 days at Lahore.



From overall analysis of atmosphere and soil, it is evident that even though below normal rains have received in this month but sever water stress conditions were not observed in the agricultural plains due to satisfactory rains received during the month. Expected winter rains in the coming February may further improve the moisture content in atmosphere and soils in the agricultural plains of the country.

Temperature Regime during January, 2015

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

Mean daily temperature ranged 10 - 11°C in Khyber Pakhtoonkhawa, 10 to 13°C in Potohar plateau, in remaining parts of Punjab it ranged 11-13°C, in Sindh it was rounded to 15°C, in Gilgit Baltistan region it ranged -3 to 3°C and was observed 1°C in the high elevated agricultural plains of Balochistan represented by Quetta valley.

Number of stress days with minimum temperature less than or equal to 0° C was observed throughout the month in 31 days in Skardu, 24 days in Gilgit and 15 days in Quetta valley. Number of stress days with maximum temperature greater or equal to 30° C or 40° C and R.H. less than or equal to 30° W was nil in all agricultural plains of the country.



The night time temperature represented by mean minimum remained normal to above normal by $1-2^{\circ}$ C in most of the agricultural plains of the country during the month. The lowest minimum temperature was recorded -6.7° C at Skardu.



Agricultural soils showed normal to above normal trend in most agricultural areas of the country in shallow as well as in deep soils. Agriculture soils showed normal to above normal trend in Rawalpindi, Quetta and Tandojam region. Whereas soil temperature remained below normal in Faisalabad region.



From the general analysis of soil behavior in this month, it is concluded that moisture content is not satisfactory in most of the agricultural soils of the country including both rainfed and irrigated areas due to mostly dry weather reported during this winter season. The situation of soil moisture may improve due to expected rains during February.

Solar Radiation and Wind Regime during January, 2015

Total bright sunshine hours and solar radiation intensity showed falling trend in most of the agriculture plains. Mean wind speed throughout agricultural plains of the country reached up to 5 km/h with North to North-West trend.





]Cumulative Rainfall, ETo and water stress for Rabi Season (October to April)





Normally Expected Weather during February, 2015

Westerly waves would continue to move along the middle latitudes and their troughs are expected to extend southward occasionally affecting country's agricultural plains. A normal precipitation ranges from 50 to 75 mm over Potohar plateau, 30 mm to 50 mm in Khyber Pakhtoonkhawa, Quetta valley and central Punjab. Less than 10 mm rainfall is expected in southern Punjab, Sindh and lower Balochistan.

Evaporative demand of the atmosphere is not likely to change significantly relative to January. According to the average conditions, it is expected to remain 2 to 3 mm/day in Punjab and Khyber Pakhtoonkhawa. In Quetta valley it will vary from 1 to 2 mm/day; while its maxima will be observed in Sindh where it may reach 4 mm/day. The probability of occurrence of rainfall over Potohar plains is given below:-

Amount/ Day	PERCENTAGE PROBABILITY OF OCCURANCE OF DIFFERENT AMOUNTS OF RAINFALL IN FEBUARY						
	1-5	6-10	11-16	17-20	21-25	26-28	
10 mm	21	22	38	40	42	29	
20 mm	13	18	32	30	34	21	
30 mm	6	8	21	13	17	12	

The days and night, during February may be slightly warmer than January. The maximum temperature in Punjab and Khyber Pakhtoonkhawa are likely to range between 19 to 24°C, 25 to 28°C in Sindh and lower Balochistan. Quetta valley will have average day temperatures around 13°C. The minimum temperature may vary from 5 to 9°C in Punjab and Khyber Pakhtoonkhawa. Slightly higher minimum would be experienced in lower Balochistan and Sindh varying from 10 to 13°C. In Quetta valley, monthly average of minima will be around 0°C. The frequency of occurrence of freezing nights will be higher in Quetta followed by mountainous and sub mountainous plains of Khyber Pakhtoonkhawa and Punjab.

The photo period during February is expected to vary between 6 hours in the north and 9 hours in the South following more or less uniformly increasing trend from north to south. Accordingly, the solar radiation intensity would also be higher in South as compared to north. It would range from 12 to 16 $MJ/M^2/day$. Wind speed at low elevation plains may remain less than 7 km/hr whereas at higher elevation it may be slightly higher. Westerly component will remain more prevalent.

The monthly water requirement of wheat crop during February is given below:

S.No	Region	Water Requirement			
		(mm)	Cubic Meter/Hectare		
1.	Quetta valley	20-25	200-250		
2.	Potohar plateau and upper KPK	30-35	300-350		
3.	Central Punjab and lower KPK	35-40	350 - 400		
4	Southern Punjab	40-45	400-450		
5.	Sindh and lower Balochistan	45-55	450-550		

Seasonal Weather Update Introduction

A variety of methods including dynamical models, statistical methods, regional expert judgments and combination of them have been used to generate long-range weather forecast by the different climate prediction centers around the world. National Agromet Center (NAMC), Pakistan Meteorological Department adopts an ensemble approach to formulate its seasonal weather outlook for Pakistan (on experimental basis), taking into consideration available products from major climate prediction centres and different Global Climate Models (GCMs).

Regional weather (precipitation and temperature) outlook is predicted from different global climate models by using persisted sea surface temperature on 0000 Jan 01, 2014. Model's output then tuned by applying Regional Correction Factor (RCF). RCF has computed by comparison of Long Range Averages (LRA) with model's simulation for the period (2004-2012) on monthly basis. That might be somewhat different from actual weather because of time to time variation in Sea Surface Temperature (SST) during the season. Accuracy of Outlook seasonal weather mainly depend upon SST used in global climate models. Even with use of accurate SST, still is uncertainty in the climate forecast due to chaotic internal variability of the atmosphere.

Acknowledgement: NAMC is gratefully acknowledges the International Research Institute (IRI) for climate and Society for providing access of dynamical prediction of Global Climate Model ECHAM4P5, developed and operated by European Center for Medium-Range Weather Forecasts model's simulations and hindcast data to support the formulation of seasonal weather outlook of Pakistan. Output maps have been prepared by using IRI climate software.

Synoptic situation

• Location of jet stream (U wind at 200 hPa) is at normal position with less intensity. The area of jet stream may be squeezed during Feb over northern of Afghanistan and Pakistan. Below normal strength of jet stream over west of the region.

Probability outlook: Normal to below normal intensity of jet stream is associated with below normal precipitation in the region.

• A ridge at 500 hPa is expected to be over central parts of the country. Slightly below normal trend is expected over northern and eastern parts of the region.

Probability outlook: normal precipitation is likely to occur the country. Lower and central parts of the country may be getting good rain during February.

- Surface temperatures are expected to be on lower side than normal all over the region including Pakistan, India and surroundings.
- North Atlantic Oscillation (NAO) is in positive phase (1.79) and in increasing trend (higher than previous month). As a result, tracks of western disturbances would be on northern region of the country.

http://www.cpc.ncep.noaa.gov/products/precip/CWlink/pna/norm.nao.monthly.b5001.current.ascii .table

Probability outlook: Below normal precipitation over all parts of the country will be expected. The focus of weather tracks may be towards northern parts of the country.

ENSO Alert System Status: El Niño Watch

Synopsis: There is an approximately 50-60% chance of El Niño within the late Northern Hemisphere winter and early spring, with ENSO-neutral slightly favored thereafter.

Equatorial sea surface temperatures (SST) remained above average in the western and central Pacific during January 2015 and cooled across the eastern Pacific. Accordingly, the latest weekly Niño indices were +0.5°C in the Niño-3.4 region and +0.9°C in the Niño-4 region, and closer to zero in the Niño-3 and Niño-1+2 regions. Subsurface temperature anomalies across the eastern half of the equatorial Pacific also averaged near zero during the month. However, an extensive area of positive subsurface anomalies persisted near the Date Line, while negative anomalies were prevalent closer to the surface east of 110°W. During the last couple of weeks of January, several aspects of the tropical Pacific atmosphere showed some movement toward El Niño. However, for the month as a whole, the equatorial low-level winds were mostly near average across the Pacific, while upper-level easterly anomalies continued in the east-central Pacific. Also, convection remained below average near the Date Line and enhanced in the western equatorial Pacific. While the tropical Pacific Ocean is at the borderline of El Niño, the overall atmosphere-ocean system remains ENSO-neutral.

Similar to last month, most models predict a weak El Niño (3-month values of the Niño-3.4 index between 0.5°C and 0.9°C) during the Northern Hemisphere late winter and spring. The forecaster consensus also favors Niño-3.4 SST index values in excess of 0.5°C within the coming season. However, climatologically, ocean-atmosphere coupling tends to weaken into the spring, which increases uncertainty over whether El Niño conditions will emerge. In summary, there is an approximately 50-60% chance of El Niño within the late Northern Hemisphere winter and early spring, with ENSO-neutral slightly favored thereafter.(http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso_tab=enso-cpc_update)

Probability outlook: La Nina (1%), Neutral (46%) and El Nino (53 %) during Feb-Mar-Apr, 2015 season

- Arabian Sea Surface Temperatures are expected to be normal near western coastal belt of Pakistan.
- Caspian Sea surface temperatures expected to be slightly above normal over southern half and below normal over upper half.
- Mediterranean Sea surface temperatures are normal to slightly above normal.
- Bay of Bengal Sea Surface Temperatures are close to normal.

Probability outlook: Sea Surface Temperature trend is going towards normal leads to below normal precipitation over the region.

Seasonal Weather Outlook Summary (Feb-Apr, 2015)

Synthesis of the latest model forecasts for Feb-Apr, 2015 (FMA), current synoptic situation and regional weather expert's judgment indicates that normal to slightly below normal precipitation is expected all over the country with average during February and April and significantly below normal during March. Slightly below average night temperature is likely to occur during February and March while above normal day temperature during April all over the country.

Weather outlook

"Below average precipitation is expected during the season all over the country with slightly below

normal temperature during whole predicted season."

- I. Average precipitation is expected over the country during February with higher deficit over eastern parts of the country including eastern Punjab, southern Baluchistan and Kashmir.
- II. Average precipitation is expected over Sindh and KP provinces during February.
- III. Above normal precipitation is expected over GB with good accumulation of snow fall over the northern parts of the country during February.

- IV. One to two moderate rainy spells are expected over all parts of the country during first 10 days of February.
- V. Below average precipitation with snow fall over the hills is expected during March.
- VI. One to two spell of light to moderate are expected over the country during early and end of March.
- VII. Below average precipitation is expected all over the country except Sindh during April.
- VIII. Night and day temperature would be on lower side during whole predicted months.

	Feb, 2015		Mar, 2015		Apr, 2015		Feb-Apr, 2015	
	ave	ехр	ave	ехр	ave	ехр	ave	ехр
GB	29.7	Abv. Ave	34.6	Abv. Ave	43.5	Ave	107.8	Abv. Ave
КР	71.9	Ave	92.5	Blw. Ave	74.7	Blw. Ave	239.1	Blw. Ave
AJK	110.5	Blw. Ave	127.5	Blw. Ave	94.9	Blw. Ave	332.9	Blw. Ave
FATA	54.0	Abv. Ave	67.4	Blw. Ave	51.5	Blw. Ave	172.8	Blw. Ave
PUNJAB	27.2	Ave	30.9	Blw. Ave	22.4	Blw. Ave	80.5	Blw. Ave
BALUCHISTAN	20.9	Ave	23.3	Blw. Ave	11.5	Abv. Ave	55.7	Blw. Ave
SIND	5.4	Ave	4.7	Ave	3.6	Abv. Ave	13.7	Abv. Ave
Pakistan	27.2	Ave	31.7	Blw. Ave	23.1	Ave	81.9	Blw. Ave

Monthly Quantitative Weather Forecast

- Ave. : average (1981-2010)
- Exp. : Expected rainfall
- Below Average (Blw. Ave) <-15 %,
- Average precipitation range (Ave) = -15 to +15 %,
- Above Average (Abv.Ave) >+15 %

Note: Average precipitation is computed by using Global Precipitation Climatology Centre (GPCC) gridded data by resolution $(0.5x0.5^{\circ})$ latitude by longitude. Ensembles of different climate models are used for computation of expected precipitation over the region.





Monthly expected Precipitation for Feb, 2015









Expected Dep. of Min. Temp. from normal, Feb-2015

فروری2015ء میں کاشتکاروں کے لیے زرعی مشورے

ماہ جنوری میں ملک کے زیادہ ترزی میدانوں میں معمول سے کم ہارشیں ہوئیں ۔ماہ فروری میں ملک کے اکثر حصوں میں بارش اور پہاڑوں پر برف باری ہونے کی او قع ہے جو کہ رائع کی اضلوں خصوصاً گندم کی فصل کے لیے نہایت ہی مفید ثابت ہوں گی ۔ کسان حضرات سے گز ارش ہے کہ کھیتوں کے گر دھنافتی پشتے مظبوط کریں تا کہ زیادہ سے زیادہ ٹی محفوظ ہو تیکے ۔ ماہ فروری میں دہند حرارت ہتدر تح پر حیس کے تاہم بلند کی پرواقع زرق میدانوں میں برف اور بارش کی ہوجہ در دی میں ملک کے اکثر حصوں میں بارش اور پہاڑوں پر برف باری ہونے کی او قع ہے جو کہ رائع کی اُس موں ہیں ا حرارت ہتدر تح پر حیس کے تاہم بلند کی پرواقع زرق میدانوں میں برف اور بارش کی ہوجہ سے درہ جرمارت نقط انجما دی گر ک خاطر رکھے کی گڑا درش ہے ۔

ا۔ اس دوران پود مے مطرار ات بیجانے کے کیوراپڑنے والی متوقع راتوں میں تھیتوں میں بلکی آبپاشی کرنے سے کھیت کا دونہ جرارت فوراً باا چا بک کم نیٹن ہوتا بلکہ آہت آہت کم ہوتا ہے اور اس دوران پود مے میں کور سے کے خلاف مقابلہ کرنے کی صلاحیت پیدا ہوجاتی ہے اسکے علاوہ کور سے بیچاؤ کے لیے پودوں پر بنائی گڑتا تکوں کی چھونپڑ کی کودن کے وقت سوری کی است تھول دینا چاہئے تا کہ سوری کی روشنی پودوں کو پہنچی رہے۔

۲۔ فصل میں جڑ کیاد ٹیوں کی موجود گی پیداوار میں کمی کے علاوہ دو گرمنٹی اثرات کابا حث بھی بنتی ہے لہذا اتبھی پیداوارھاصل کرنے کے لیے ان جڑ کیاد ٹیوں کی تلفی کے لیے صل پر زمر کا فوراً سپر ب کریں بنیز ہوا، دھند یابا رش کی صورت میں سپر سے ہرگز نہ کریں اور تحکہ زراعت کے مشورے ریمل کریں۔

۳۔ دود هدینے والے جانو دوں او رائلے بچوں کیلیے سر دی کی شدت سے بچاؤ کے لیے مناسب انتظامات نہ ہونے کی صورت میں تؤشیخ والی مر دی بہت نقصان دہ ثابت ہوتی ہے او راس سے متاثر ہونے والے جانوروں کی دود ہو کی پیدادار بہت کم ہوجاتی ہے جبکہا نکے بچ بعض اوقات زندگی سے ہاتھ دھو بیٹھتے ہیں ساس لئے ضرو رمی ہے کہ انہیں رات کی سر دمی اور شک ہوا ڈس سے مخفو ظار کھاجائے۔ مرفیوں کے انڈ سے او رکوشت کی پیدادار بھی سر دمکی کی شدت کی دہل متاثر ہوتی ہے اس نقصان سے بچتے کیلیے ضرو رمی ہے کہ انہیں رات کی سر دمی او ڈس سے محفو ظار کھاجائے۔

1) تعارف:

گندم کی پیدادار پریشمول موسم اثر اندا زہونے دالےا ہم عوامل

کندم ایم سان موسم را (ملط) کی سب سے اہم تصل ہے ۔جس کی 80 فیصد کا شت اور پیدادان کو بیڈ تر یا 15 فیصد مند حاور باتی تحیر پیکٹو تلواداد یکھ جنتا ان میں ہوتی ہے ۔گذم پاکستان کے اکثر فی آباد کی کرفرد کسکالاز کی کر ہے۔ پاکستان میں گذم کی اوسط فی ایکز پیداد ارز قافت کر ایک کی حاص زیا در سے زیادہ اور اور اور اواس ہونے دانی پیداد ایک (Poten cial yield) کے مقاطبے میں ایک چراقاتی ہے۔

2) با کستان میں گندم کے پیدادار میں کمی کی جنا دی وجوہات:

جغرافالا می کند کیلیس سیکن ای لی کرک که اکثری میدانون پر بارش کند میکن که کرد. مدین میدانون پی کند کیلیس این کرک که که اکثری میدانون پر بارش کند میکن که که میکن ای کی کرد. مدین این که معد انون پر بارش کند که معدانون پر بارش کند که که معدانون پر بارش کند که که معدانون پر بارش کند که که معدان میکن ای که معد معدن این میکند که معدانون پر معدانون کی میدانون کی معدانون پر معدان معدان معدان میکن این که معدانون که معدانون کی میدانون کی میدانون کی معدان که معدان معدان معدان معدان معدان که معدانون کی معدانون کی میدانون کی میدانون که معدان معدن معدن معدان معدا معد معدان م معد معدان م

بر د**قت زائد جژی بونیوں کی تلقی**