

PAK-SCMS

BULLETIN

PAKISTAN: SATELLITE BASED CROP MONITORING SYSTEM

Volume IX, Issue 12, Serial No. 108 1-December-2019

SUPARCO, the National Space Agency of Pakistan, started the program on "Monitoring of Crops through Satellite Technology" during the year 2005. This is a perpetual study encompassing all growing seasons around the year. The purpose of this initiative is to reinforce support for policy makers, planners and private sector for food security, stocking, marketing, trade and industrial management. The final crop estimates are released by end of March for Rabi crops and mid of October for Kharif crops.

Food and Agriculture Organization of United Nations, (FAO-UN) provided technical backstopping for analytics and transfer of technology. Wheat, cotton, rice, sugarcane, maize and potato crops are being covered under this program. In addition, large scale geospatial applications of satellite remote sensing technology have been made for monitoring/mitigation of natural disasters (floods, flash floods, and drought) and providing reconnaissance detailed information ordained for the uplift of agriculture and allied pursuits.

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CROP SITUATION: NOVEMBER 2019

Summary

Normalized Difference Vegetation Index (NDVI), after touching lowest values have started increasing, indicating a transitional stage from Kharif to Rabi season.

Wheat crop sowing is in progress in the country. Prospects of wheat crop 2019-20 looks promising due to; a) increase in wheat support price this year from Rs. 1300 per 40 kg to Rs. 1365 per 40 kg, b) timely sowing of wheat due to early termination of Kharif crops particularly cotton c) favorable weather conditions d) higher wheat targets to meet food requirements of the country. Decrease in offtake of fertilizers, however, may affect wheat production.

By the end of November, cotton crop was at terminal stage with its last picking in some areas of Punjab. According to Pakistan Cotton Ginning Association (PCGA) report of 1st December 2019, cotton arrivals in the ginning factories of Pakistan were 7.448 million bales as compared to 9.367 million bales during last year (down by 20.49 percent). In Punjab and Sindh, the cotton arrivals during the reported

period were lower by 24.06 and 15.52 percent, respectively, as compared to the same period of last year.

Sugarcane crop harvesting has been started with start of crushing operations by sugar mills. Provincial governments have increased sugarcane support price due to increase in cost of production. Punjab and Sindh governments have notified sugarcane prices @ Rs. 190 and 192 per 40 kg, respectively.

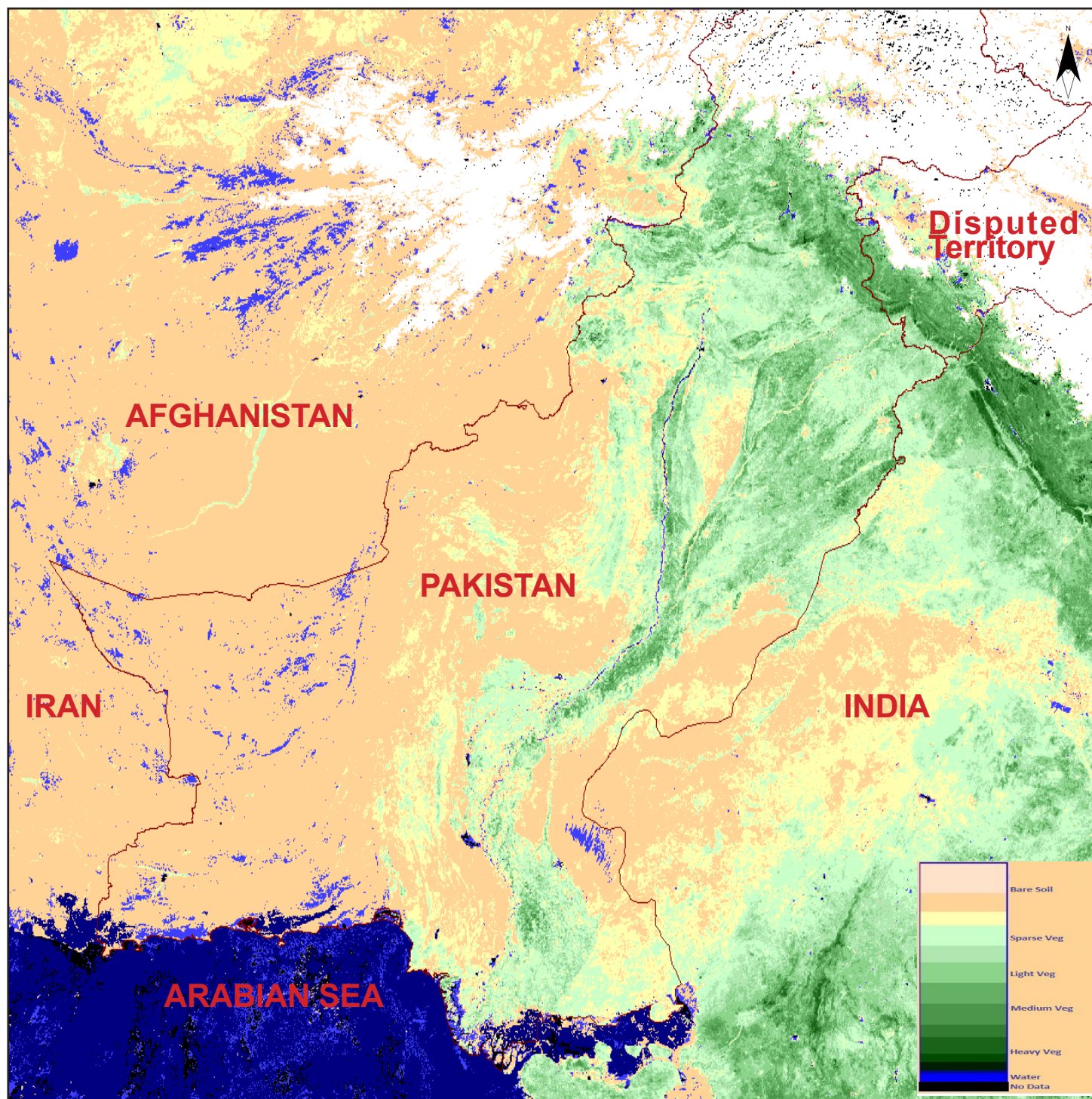
Rice harvesting particularly of the basmati got momentum during November. Government is making efforts to increase rice exports that may result in better rice prices in the local markets.

As per report of Indus River System Authority (IRSA) for November 2019, the irrigation water supply was 6.222 MAF against the last year's supply of 5.153 MAF, up by 20.75 percent. As compared to the same period of last year, the irrigation water supplies in Punjab, Sindh and Balochistan were higher by 19.35, 27.19 and 7.55 percent, respectively. Khyber

CROPS SITUATION

Pakhtunkhwa, however, has faced shortfall of irrigation water supply by 16.92 Percent.

As per report of National Fertilizer Development Centre (NFDC), total availability of Urea in October 2019 was 1005 thousand tons whereas total availability of DAP was 914 thousand tons. During October 2019, offtake of Nitrogen, Phosphate and Potash was lower by 62.9, 45.4 and 22.9 percent, respectively, as compared to the same period of last year.



Normalized Difference Vegetation Index (NDVI) 30th November 2019

Rabi Crops 2019-20

Wheat

Wheat crop sowing is in progress. Prospects of wheat 2019-20 looks promising due to; a) increase in support price of wheat after five years b) timely sowing of wheat due to early termination of Kharif crops particularly cotton c) favorable weather conditions d) higher targets to meet food requirements of the country.

For the last five years, wheat support price has been unchanged and kept at Rs. 1300 per 40 kg. The Economic Coordination Committee (ECC) of the Cabinet has fixed wheat support price of Rs 1365 per 40 kg this year. Initially ECC announced wheat support price of Rs. 1350 per 40 kg in the mid November. Later on, considering the cost of wheat production at the level of Rs. 1349.57 per 40 kg, on the recommendation of relevant stakeholders, the price was increased from Rs. 1350 to Rs. 1365 per 40 kg at the end of November 2019. This increase in support price will increase growers' net margins and help them to have better crop husbandry measures.

Weather conditions have reduced not only Kharif crops productivity but also have resulted in early termination of crops especially cotton. This may help growers to timely sow their Rabi crops including wheat. Weather conditions are also conducive for wheat crop. Timely and more than last year rains may result in better wheat germination and growth particularly in Barani areas of the country.

This year wheat area and production targets have been increased to meet country's food requirement during the year 2019-20. Federal Committee on Agriculture (FCA) in its meeting held on 10th October, 2019 fixed wheat crop targets for 2019-20 with consensus of the provinces. Province wise wheat crop 2019-20 targets are as follows:

Wheat Targets 2019-20 fixed by FCA			
Province	Area (000 Hec)	Production (000 Mt)	Yield (kg/ ha)
Punjab	6,560.0	19,660.0	2997.0
Sindh	1,150.0	3,800.0	3304.3
Khyber Pakhtunkhwa	900.0	2,570.0	2855.6
Balochistan	550.0	1,000.0	1818.2
Pakistan	9160.0	27030.0	2950.9

Kharif Crops 2019-20

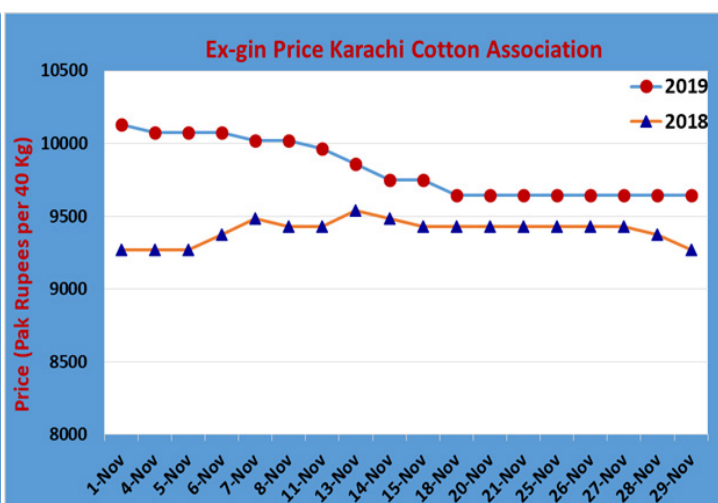
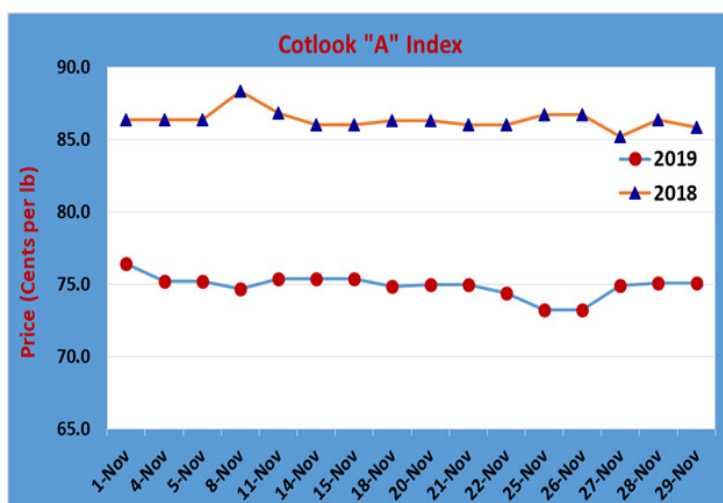
Cotton

Cotton crop was at terminal stage with its last picking in some limited areas at the end of November. This year the cotton crop size remained lower mainly due to; a) decrease in area sown, b) unfavorable weather conditions particularly in the first fortnight of September, c) higher insect pest infestation and d) decrease in farmers' net margins owing to higher cost of production.

According to PCGA report of 1st December 2019, cotton arrivals in the ginning factories of Pakistan were 7.448 million bales as compared to 9.367 million bales during last year (down by 20.49 percent). In Punjab and Sindh, the cotton arrivals during the reported period were lower by 24.06 and 15.52 percent, respectively, as compared to the same period of last year. The details of cotton arrivals are given below:

Province	2019	2018	Difference	
	(000) Bales		Percent	
Punjab	4,141,096	5,453,117	-1,312,021	-24.06
Sindh	3,306,448	3,913,821	-607,373	-15.52
Total	7,447,544	9,366,938	-1,919,394	-20.49

In the international market, average cotton price during November 2019 was 74.93 cents per lb as compared to average price of 86.39 cents per lb during November 2018, showing a decrease of 11.46 cents per lb (down by 13.3 percent). Local markets, however, have an average ex-gin price of Rs. 9827 during November 2019 against Rs. 9401 per 40 kg in 2018 showing an increase of around Rs. 426 per 40 kg (4.5 percent). Increase in local markets prices was mainly due to substantial decrease in cotton production in the country and currency devaluation. Phutti prices during November 2019 generally ranged from Rs. 3400 to 4200 per 40 kg, higher than that of last month depending upon lint quality. Graphs showing Cotlook "A" index and Karachi Cotton Association (Ex-gin) prices are given below:



Source: PCCC

Sugarcane

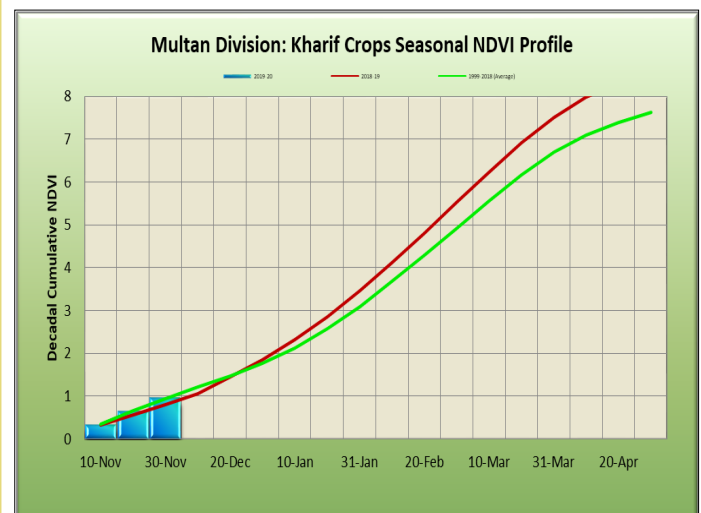
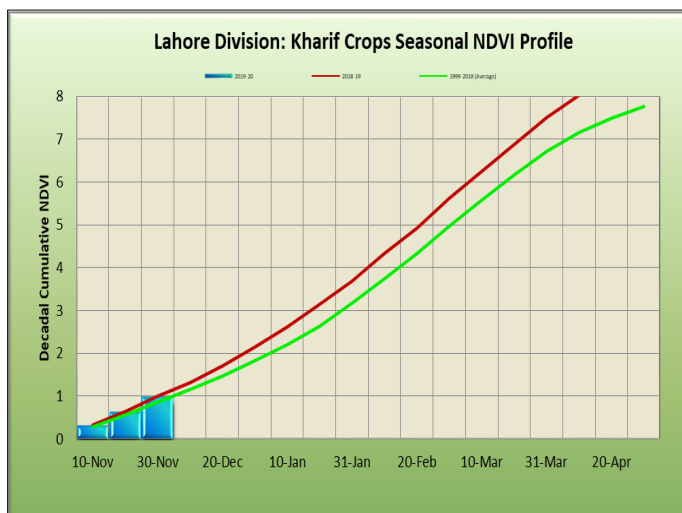
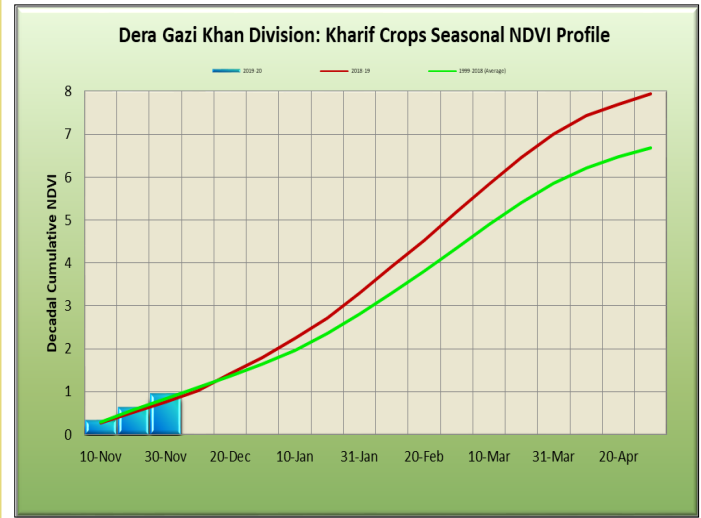
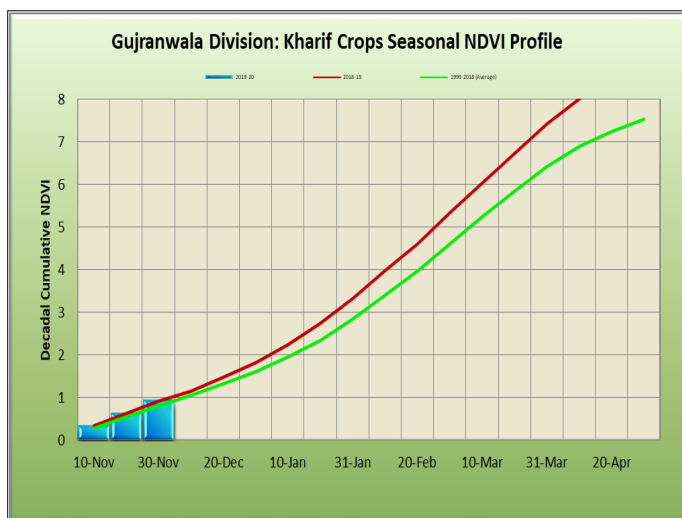
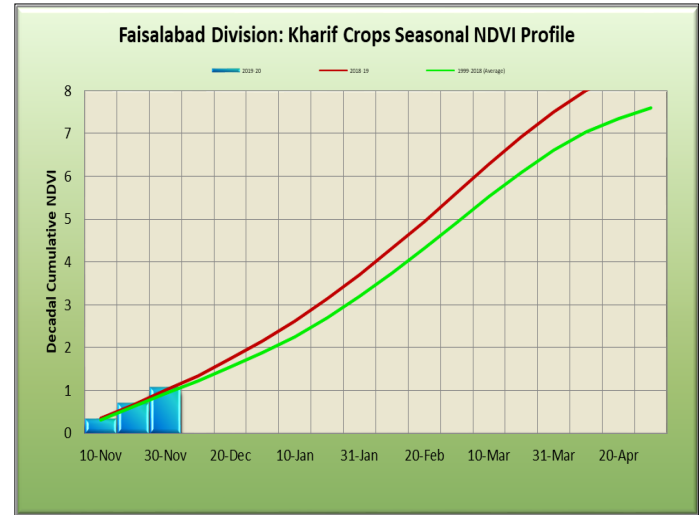
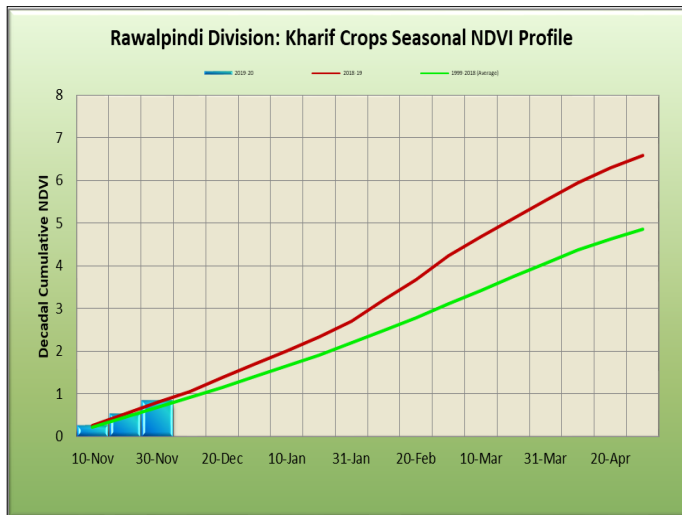
Sugarcane crop is at maturity stage. Harvesting of the sugarcane has been started with the start of sugar mills operations in some areas. Provincial governments have notified sugarcane support price. Punjab and Sindh governments have notified sugarcane prices @ Rs. 190 and 192 per 40 kg, respectively. This increase in sugarcane price may compensate farmers' net margins due to increase in cost of production in addition to increase in sugarcane area in the coming season.

Rice

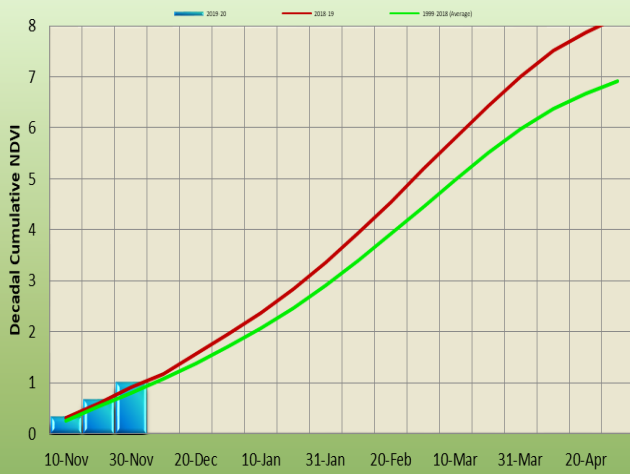
Rice harvesting, particularly of the basmati, got momentum during November. Late sown rice generally has better per acre yield as compared to early sown mainly due to high temperatures during the first fortnight of September. Government is making efforts to increase rice exports that may result in better rice prices in the local market.

Normalized Difference Vegetation Index (NDVI): Crop Growth Profiles

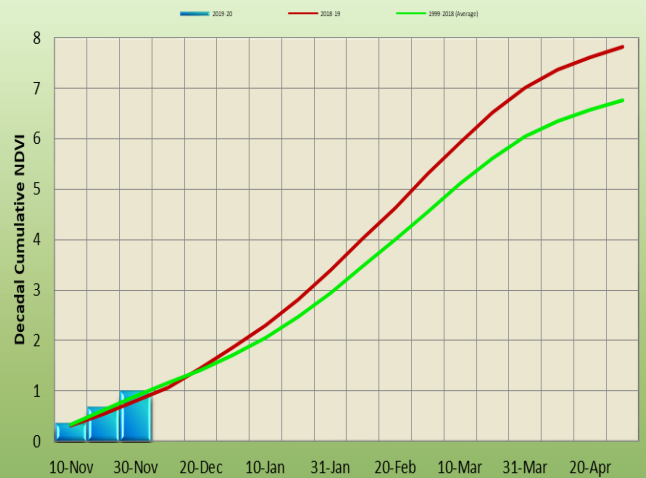
SUPARCO is acquiring MODIS 250 m resolution imagery on daily basis and Proba -V VGT 1000 m resolution imagery on 10 day basis to monitor crop growth. The multi-date high resolution data are being acquired during each cropping season to assess vegetation changes and size of cropped areas through image classification. The Proba-V VGT based graphs depicting temporal vegetation changes for various administrative units of the country are as follows:



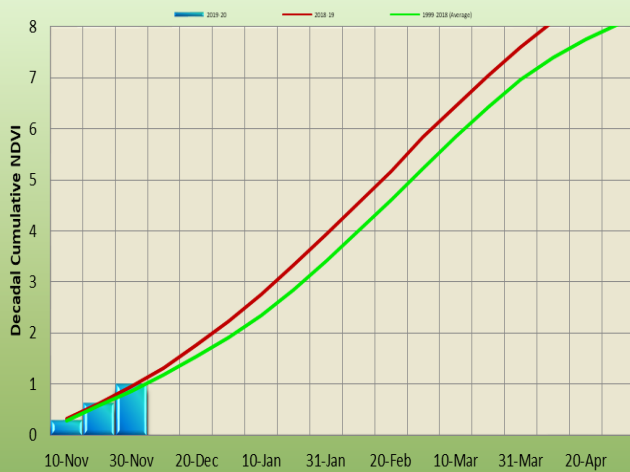
Sargodha Division: Kharif Crops Seasonal NDVI Profile



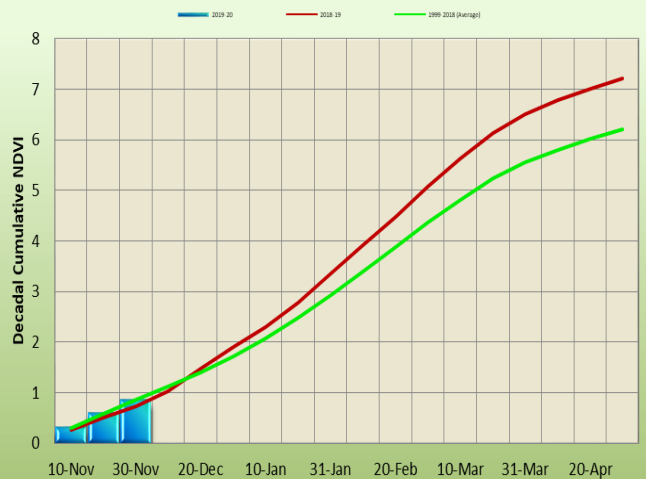
Bahawalpur Division: Kharif Crops Seasonal NDVI Profile



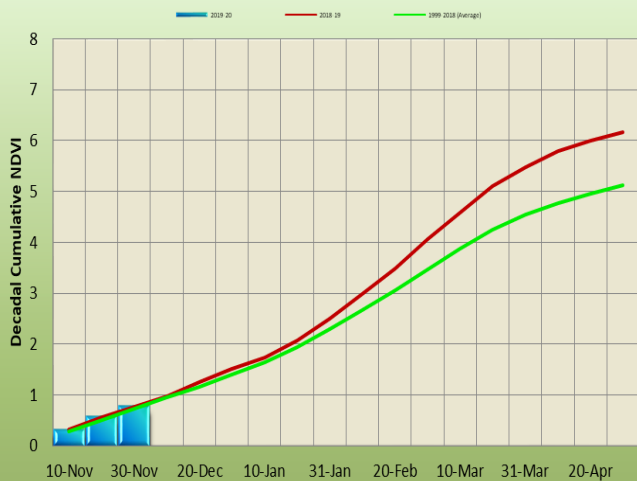
Sahiwal Division: Kharif Crops Seasonal NDVI Profile



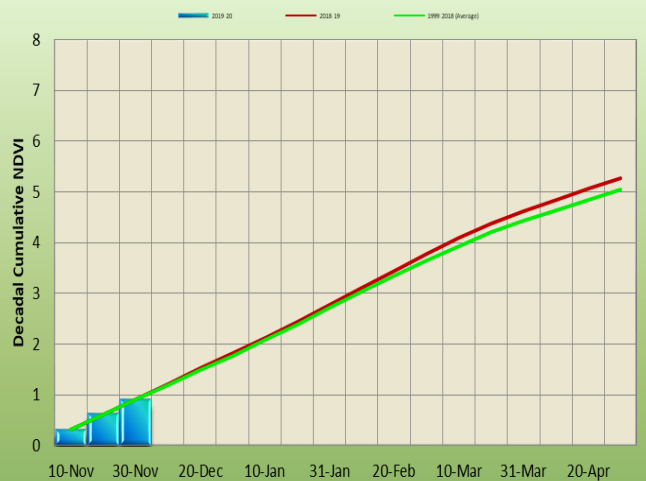
Sukkur Division: Kharif Crops Seasonal NDVI Profile



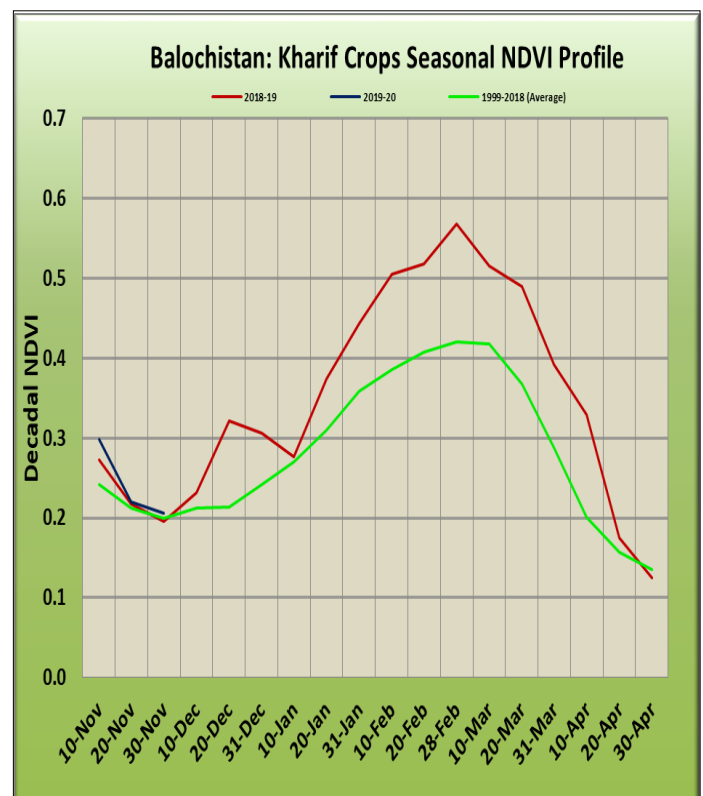
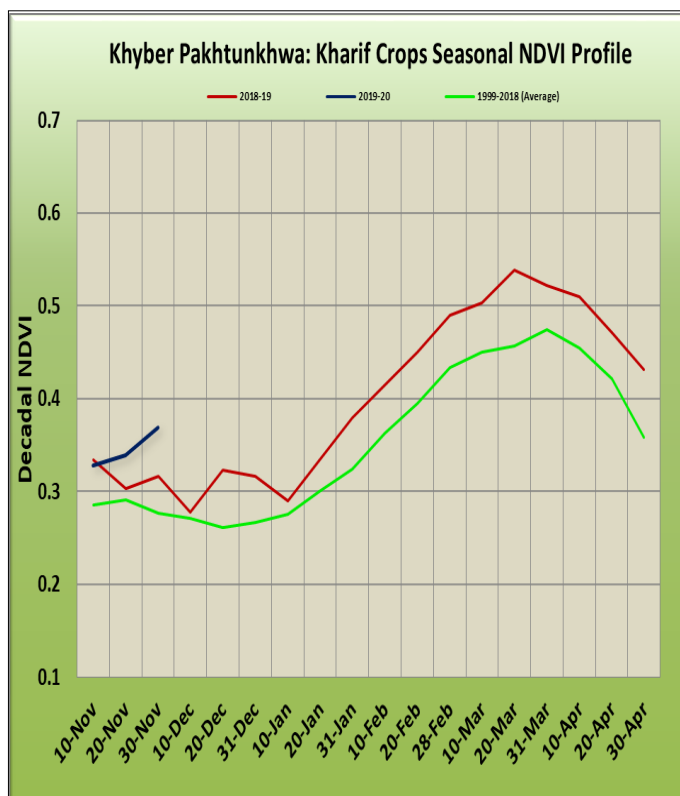
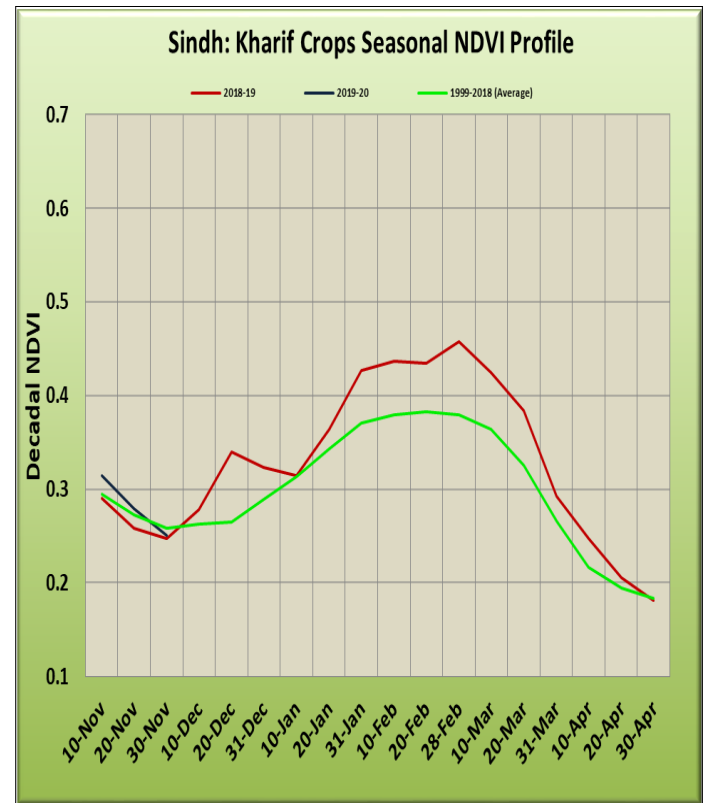
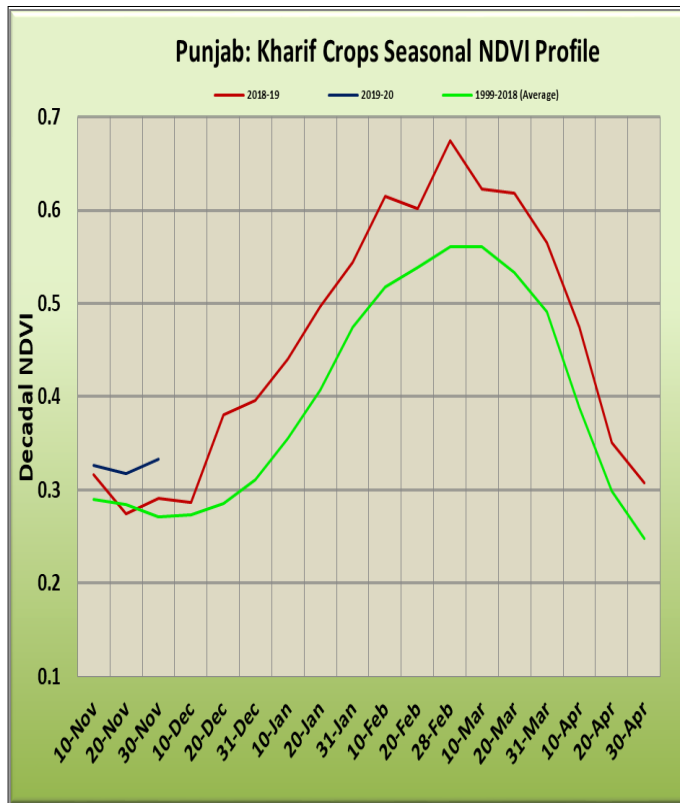
Larkana Division: Kharif Crops Seasonal NDVI Profile



Hyderabad Division: Kharif Crops Seasonal NDVI Profile

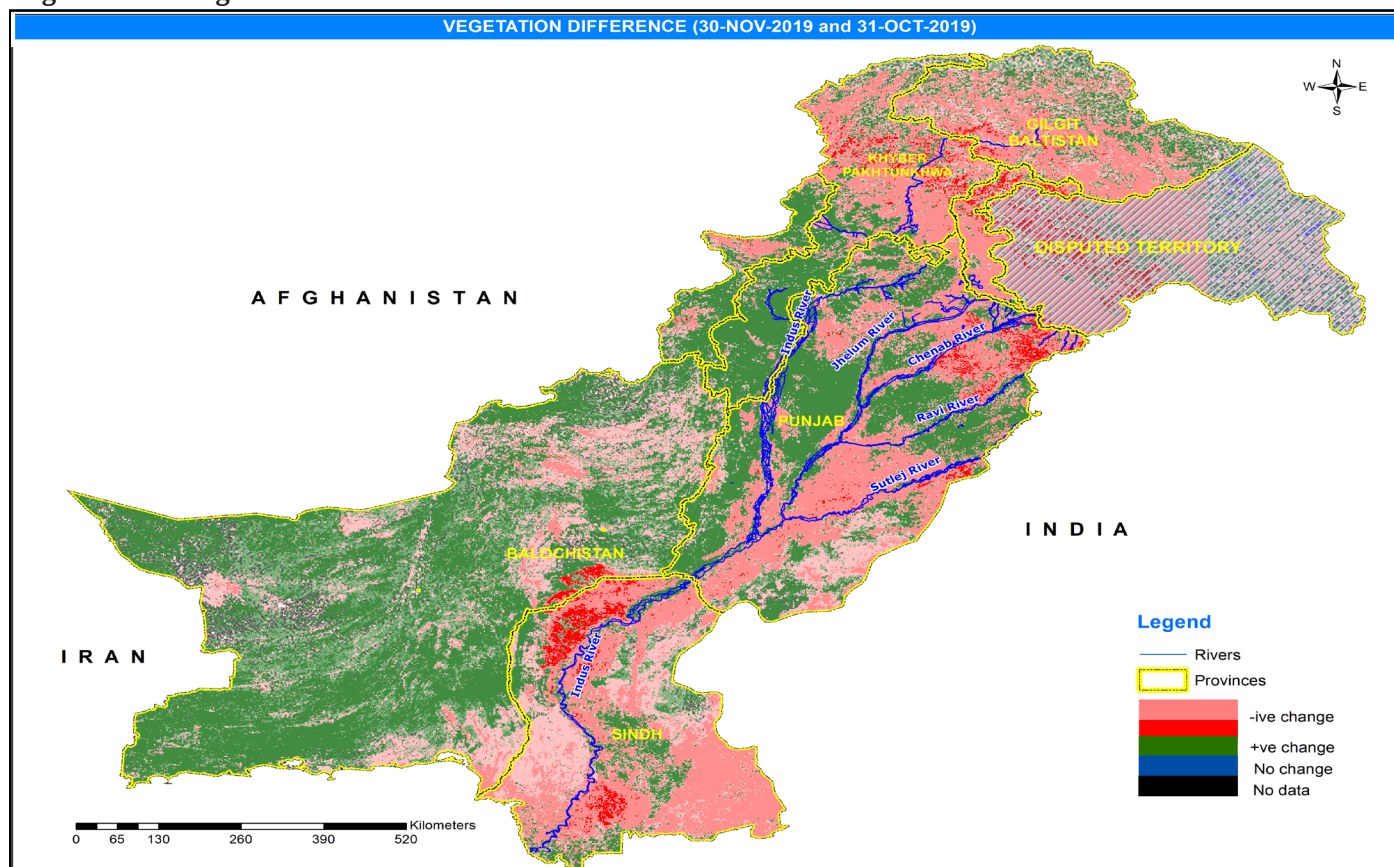


Normalized Difference Vegetation Index (NDVI): Crop Growth Profile at Provincial Level

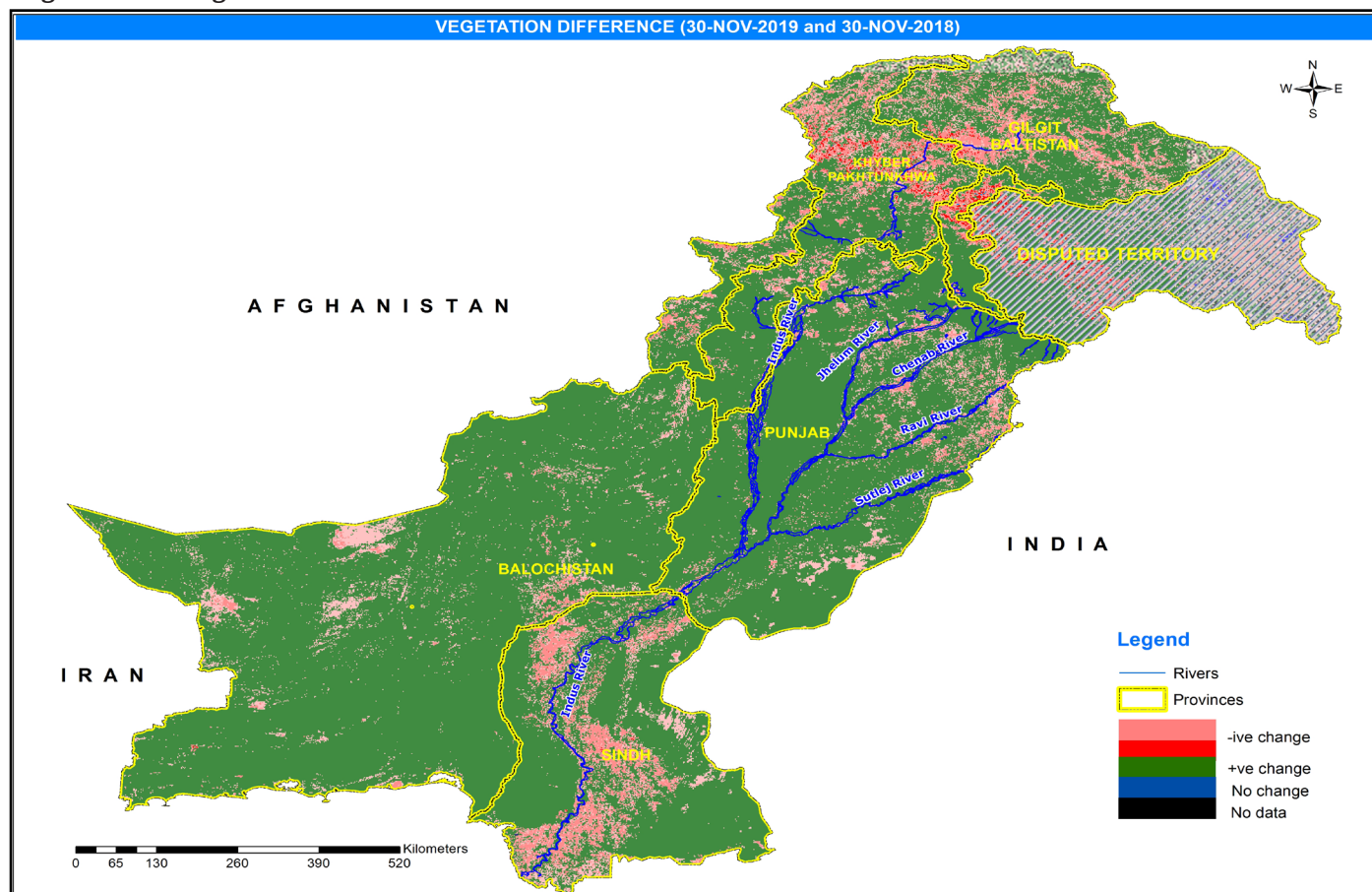


VEGETATION DIFFERENCE

Vegetation Change: November 2019 vs October 2019



Vegetation Change: November 2019 vs November 2018

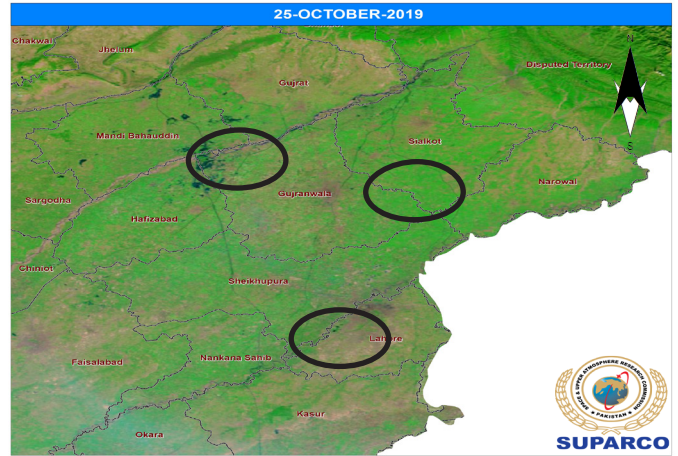
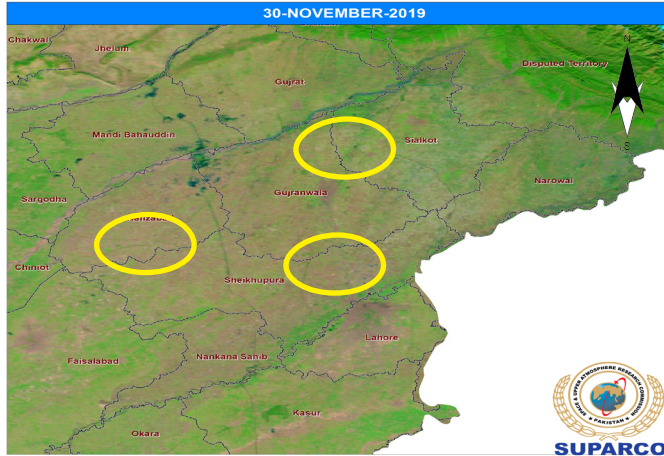


SATELLITE IMAGERY: SPOT VGT 1000M

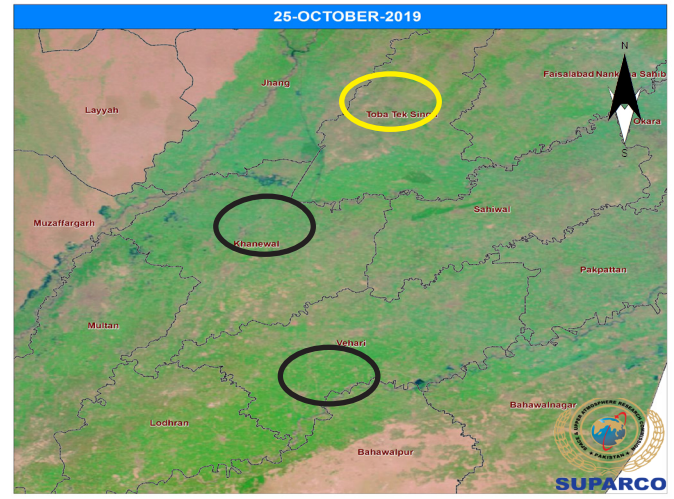
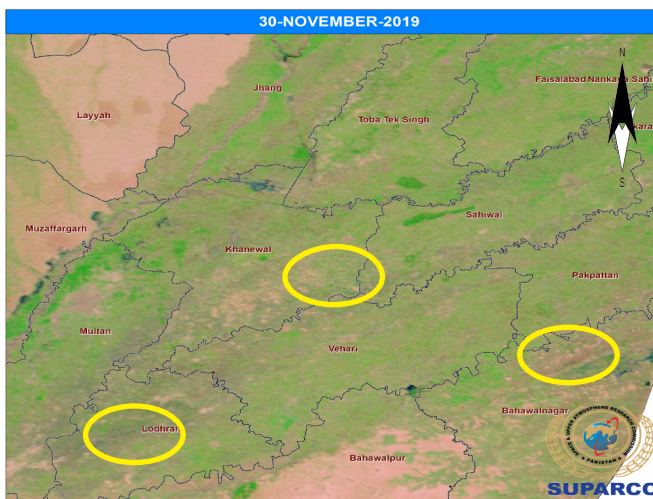
Temporal Vegetation Changes

○ Sowing/Land preparation
 ○ Active Growth
 ○ Maturity
 ○ Harvesting
 Satellite Imagery: MODIS 250m

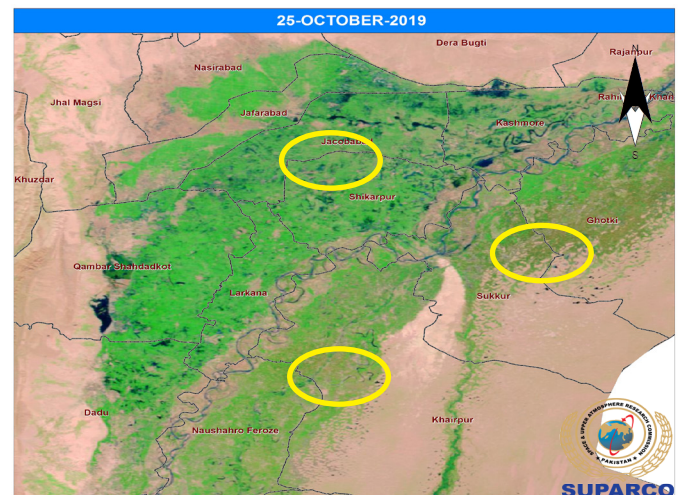
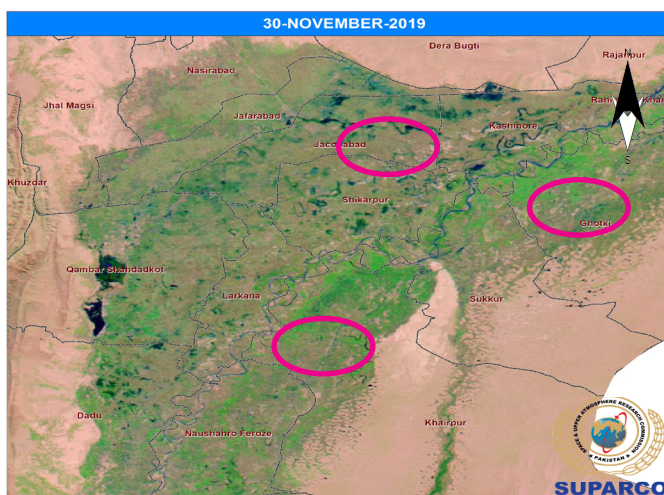
Temporal Change: Kallar Tract (main basmati growing areas), Punjab



Temporal Change: Southern Punjab



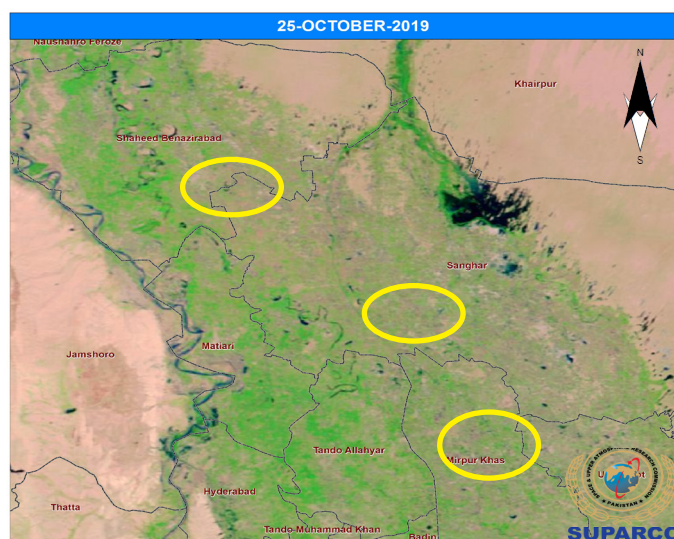
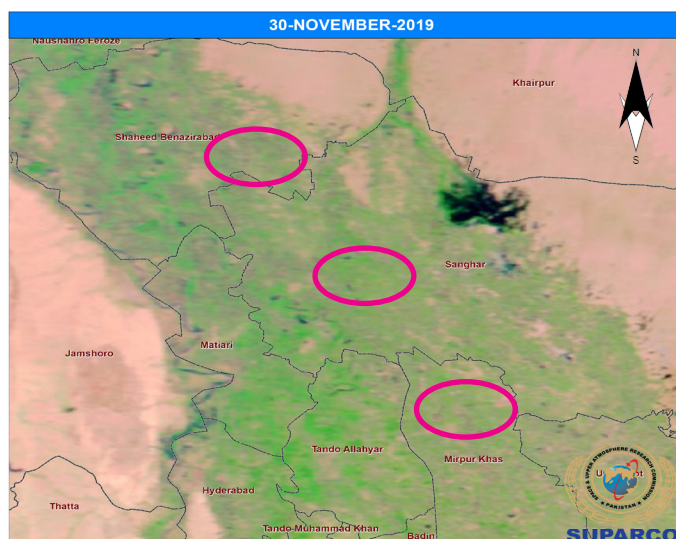
Temporal Change: Larkana Division, Sindh



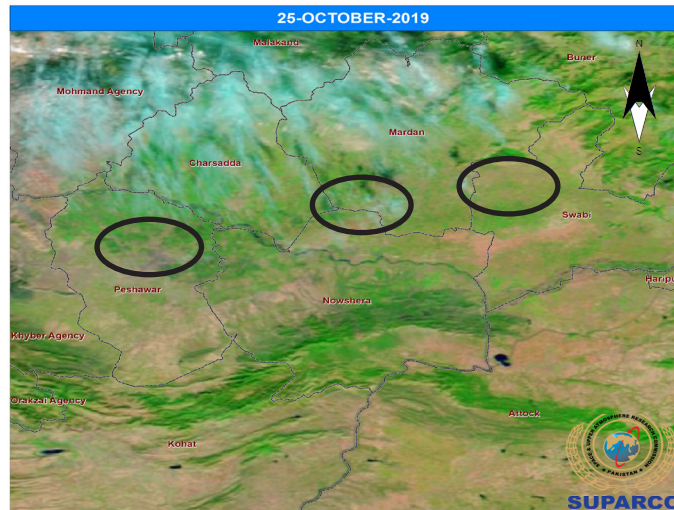
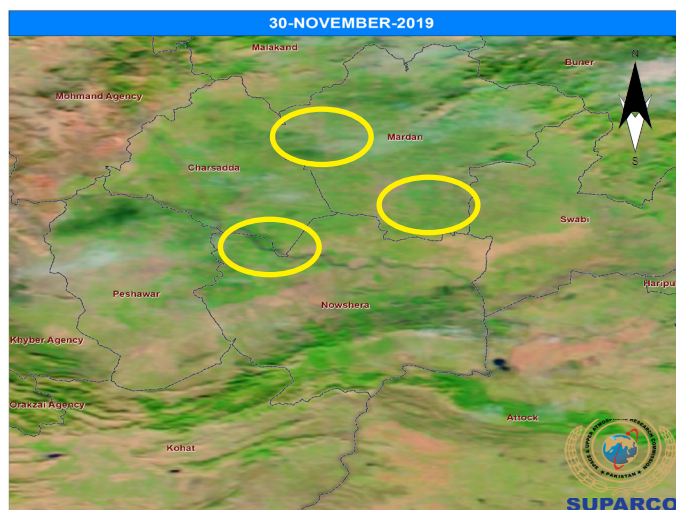
TEMPORAL VEGETATION CHANGES



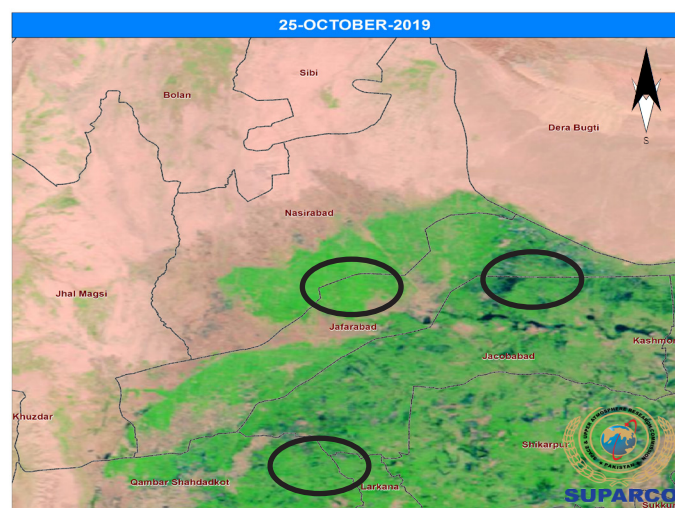
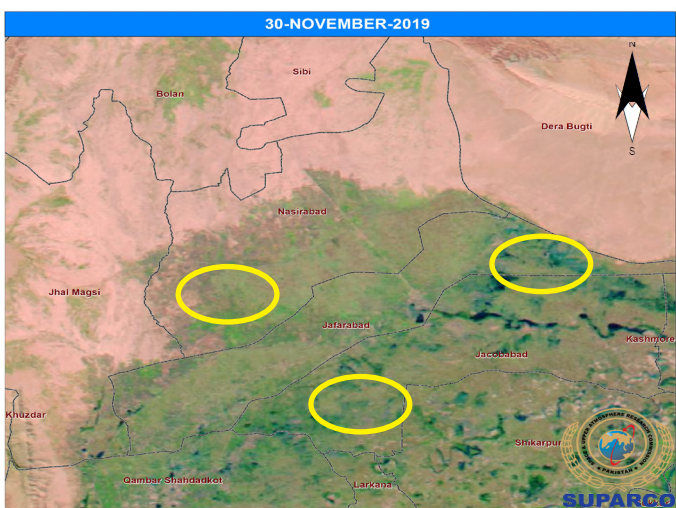
Temporal Change: Sindh



Temporal Change: Khyber Pakhtunkhwa



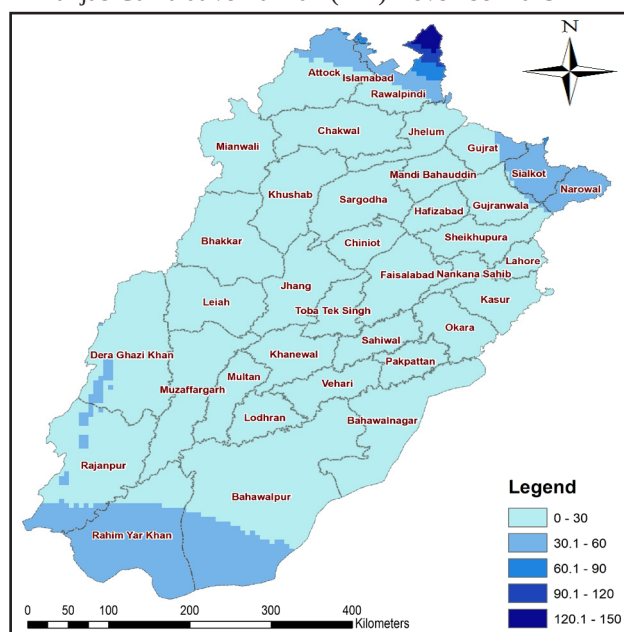
Temporal Change: Pat Feeder Area of Balochistan



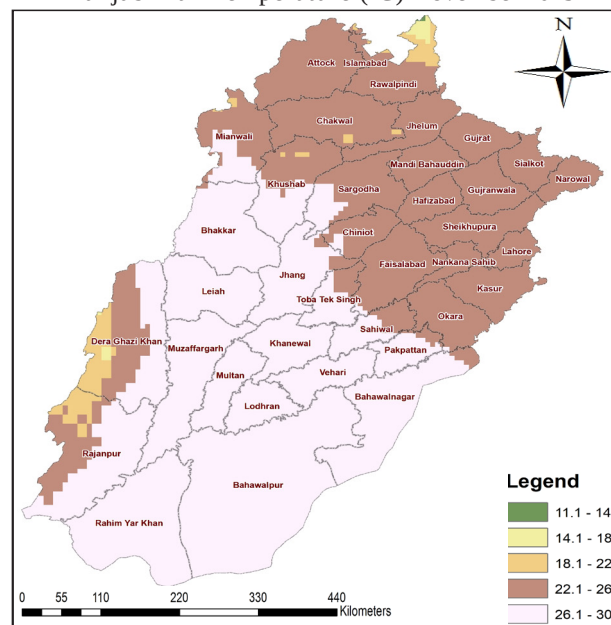
Agro-Met Conditions

During November 2019, 2-3 rainspells were observed throughout the country. In Punjab, Murree received rainfall of 146 mm, Islamabad 54 mm, Sialkot 51 mm, Chakwal 31 mm while rest of Punjab received less than 30 mm of rainfall. In Khyber Pakhtunkhwa maximum cumulative rainfall was 182 mm in Dir, Kalam 153 mm, Balakot 149 mm, Kakul 145 mm, Mirkhani 130 mm, Malam Jabba 127 mm, Drosh 120 mm while rest of Khyber Pakhtunkhwa received less than 80 mm of rainfall. In Sindh, Padidan received rainfall of 162 mm, Rohri 144 mm, Mirpurkhas 130 mm, Larkana 107 mm, Sukkur 86 mm while rest of Sindh received less than 50 mm of rainfall. In Balochistan, maximum cumulative rainfall was 50 mm in Khuzdar, Barkhan 25 mm, Zhob 21 mm while rest of Balochistan received less than 20 mm of rainfall.

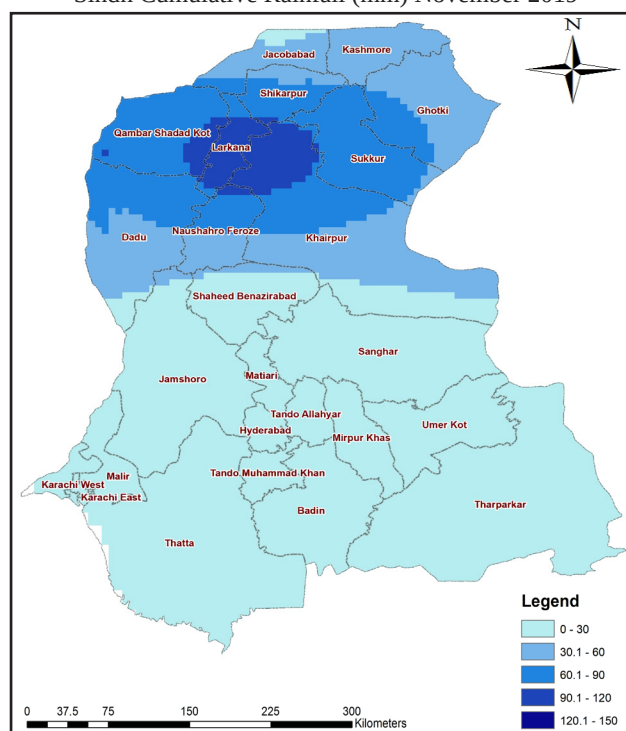
Punjab Cumulative Rainfall (mm) November 2019



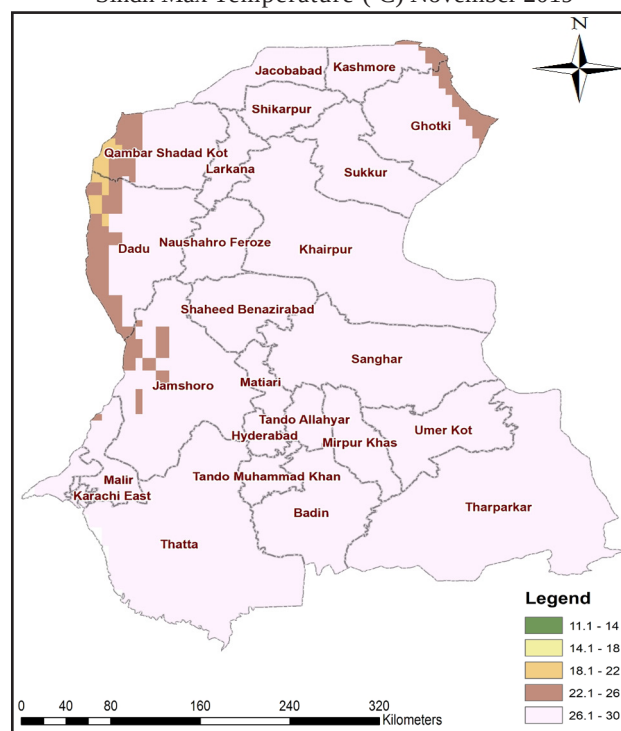
Punjab Max Temperature (°C) November 2019



Sindh Cumulative Rainfall (mm) November 2019

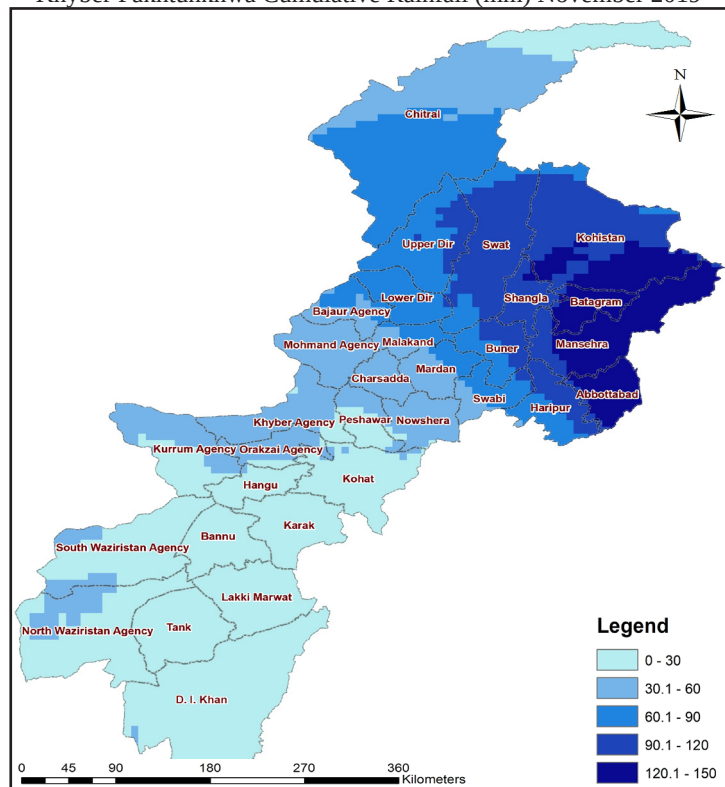


Sindh Max Temperature (°C) November 2019

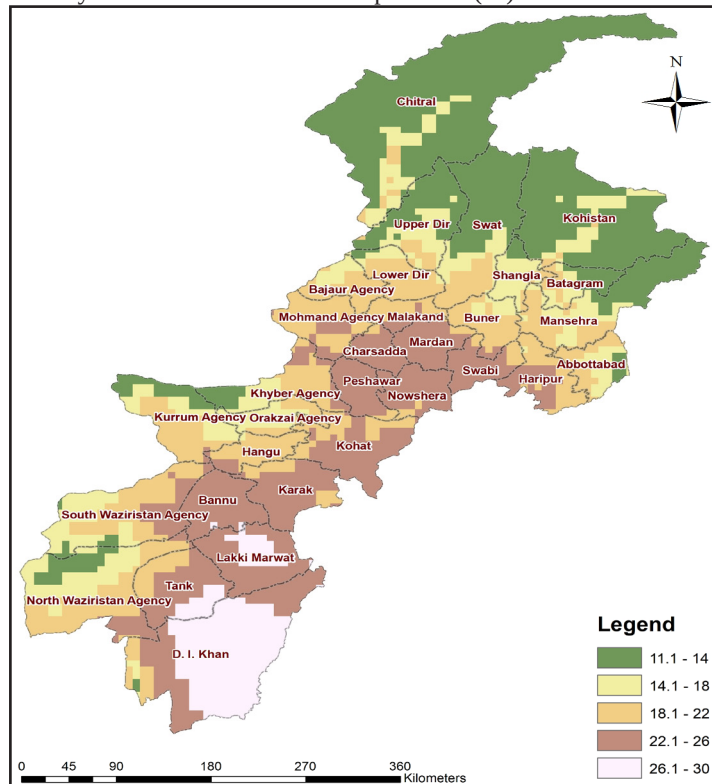


AGRO-MET CONDITIONS

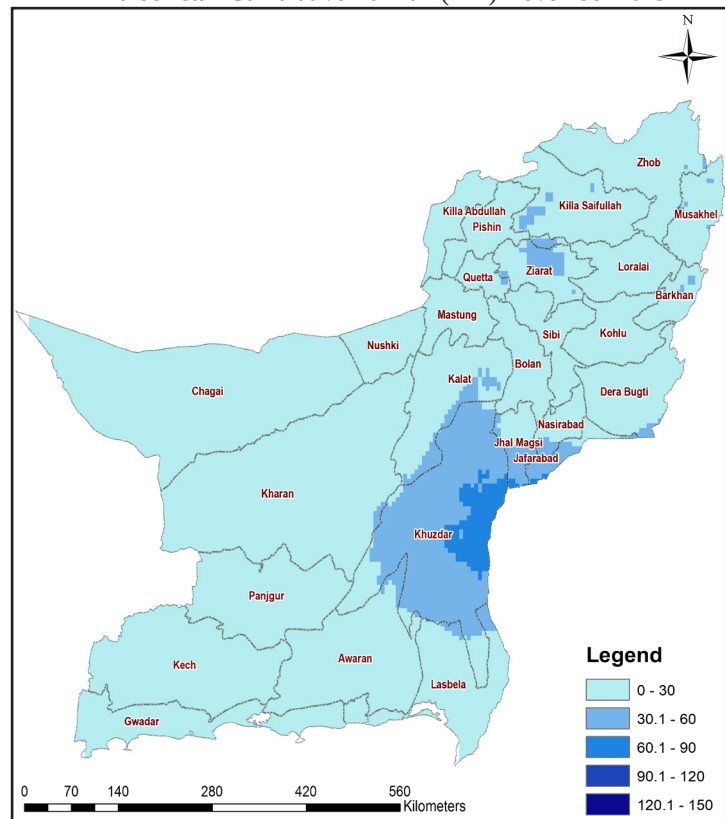
Khyber Pakhtunkhwa Cumulative Rainfall (mm) November 2019



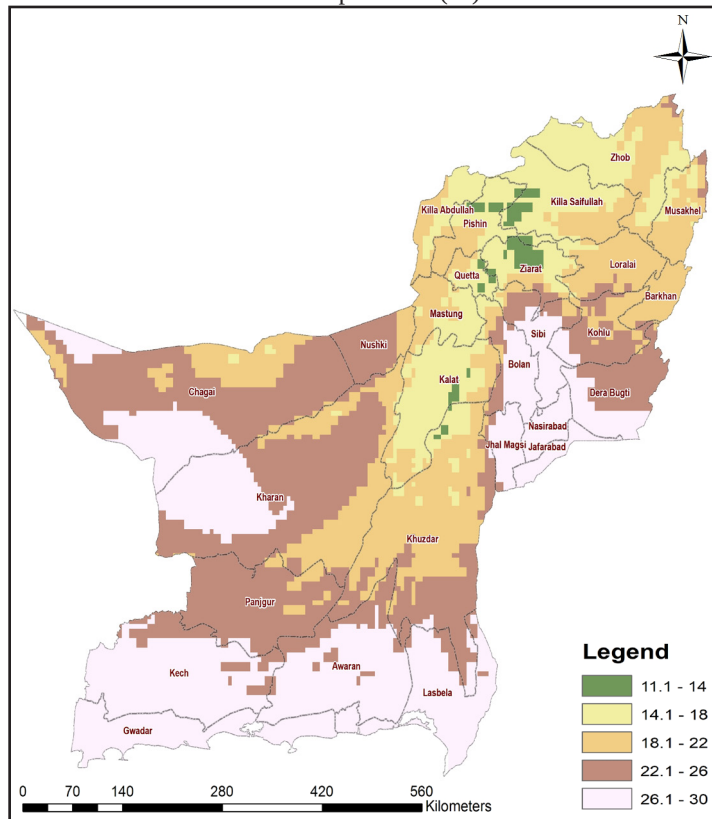
Khyber Pakhtunkhwa Max Temperature (°C) November 2019



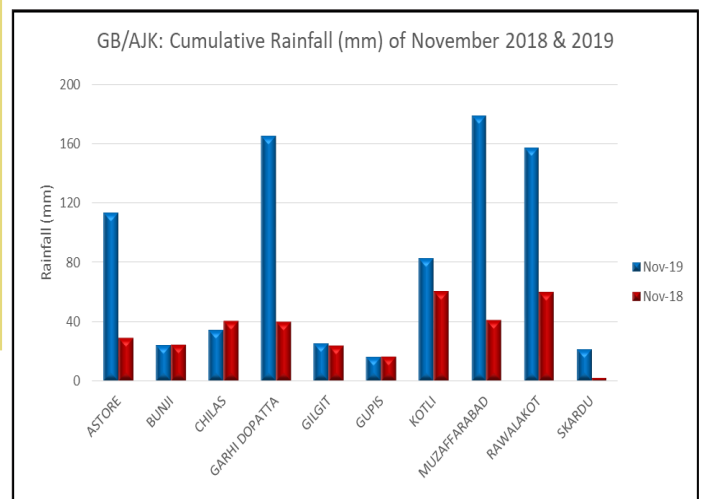
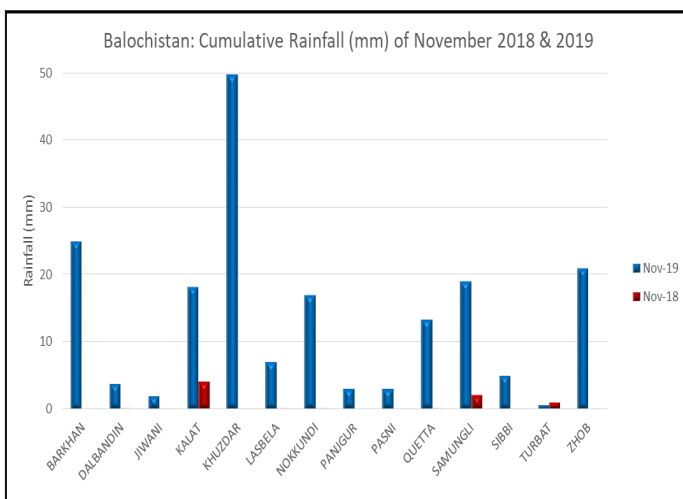
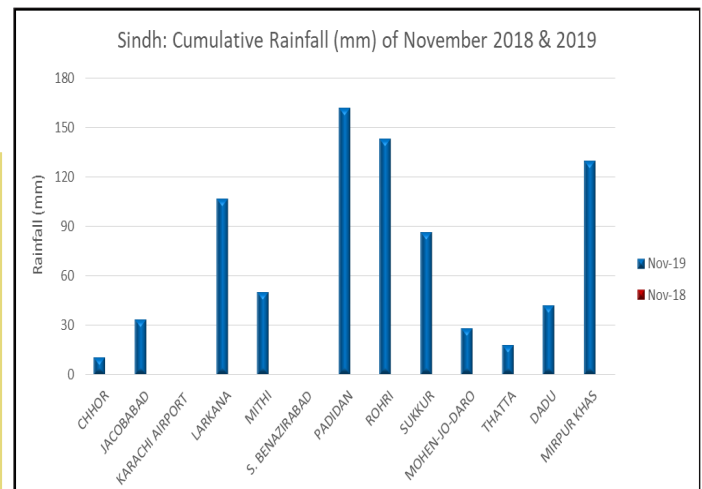
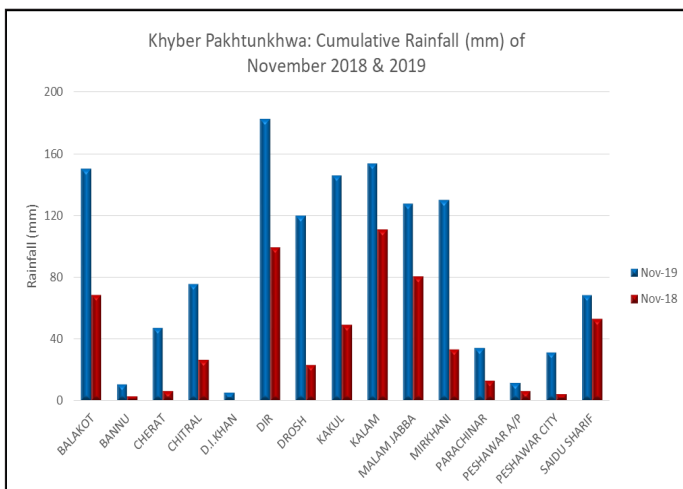
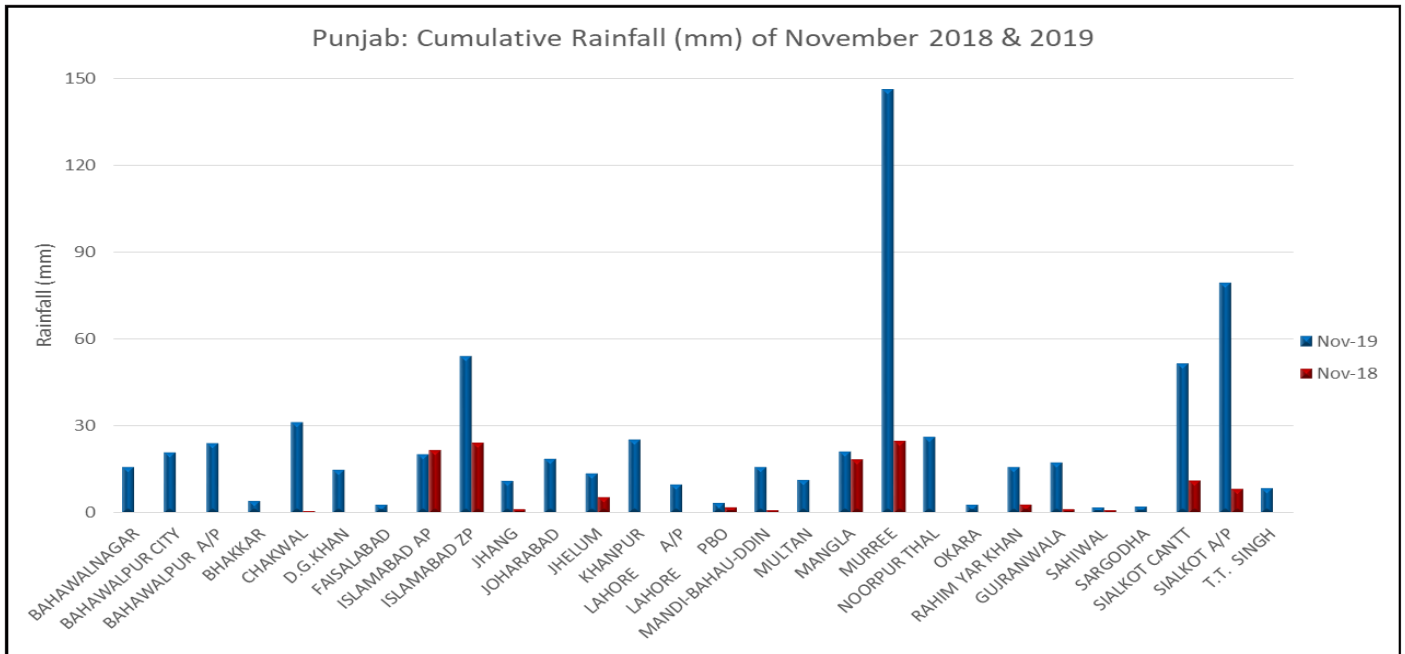
Balochistan Cumulative Rainfall (mm) November 2019



Balochistan Max Temperature (°C) November 2019

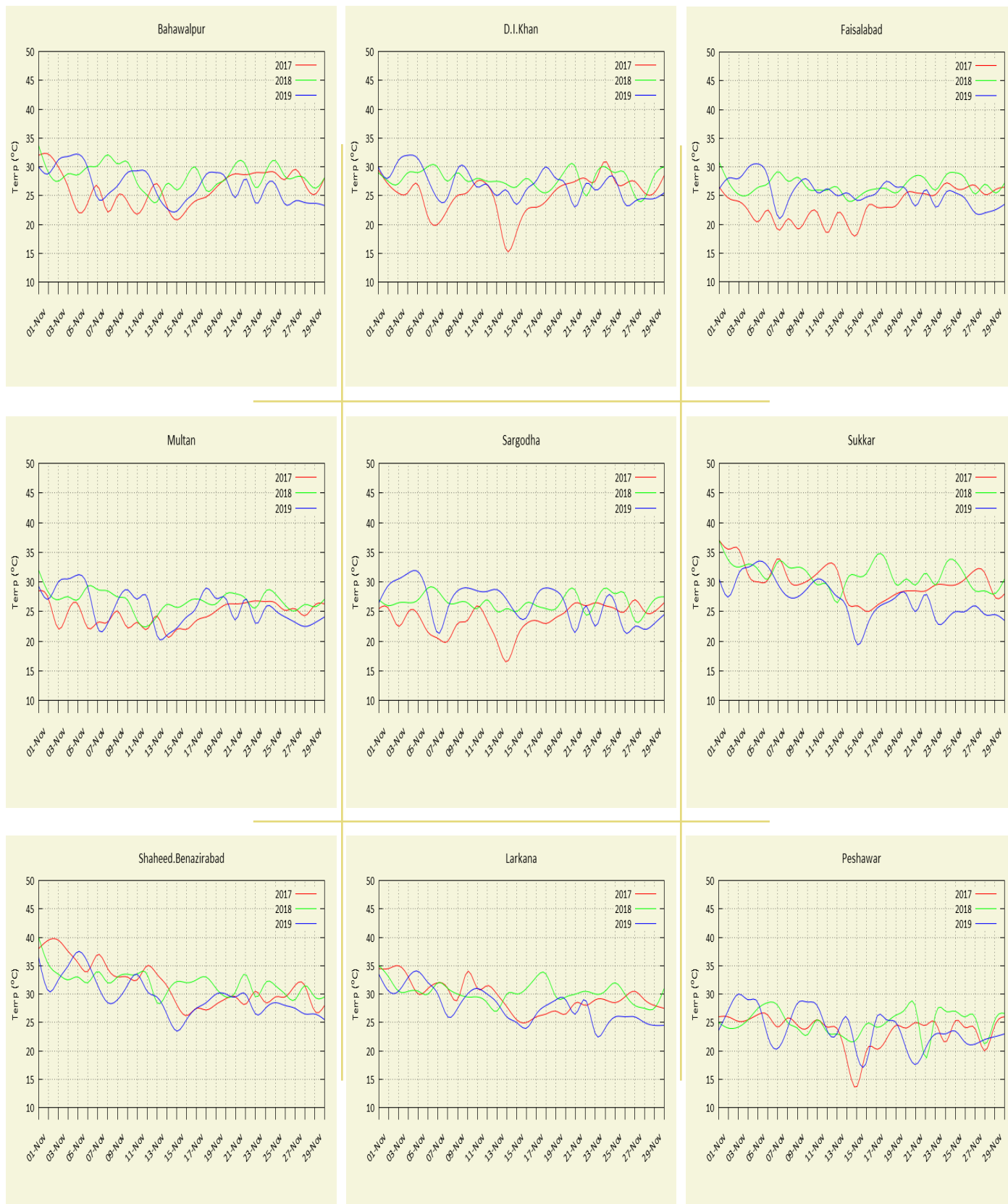


Monthly Rainfall (mm): November (2018 & 2019)



Maximum Temperature: November 2019

The ranges of maximum temperature (°C) during November 2019 were as follows:



Minimum Temperature: November 2019

The ranges of minimum temperature (°C) during November 2019 were as follows:

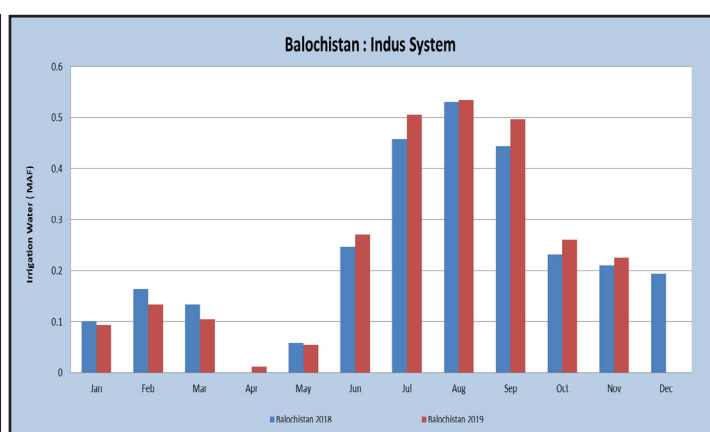
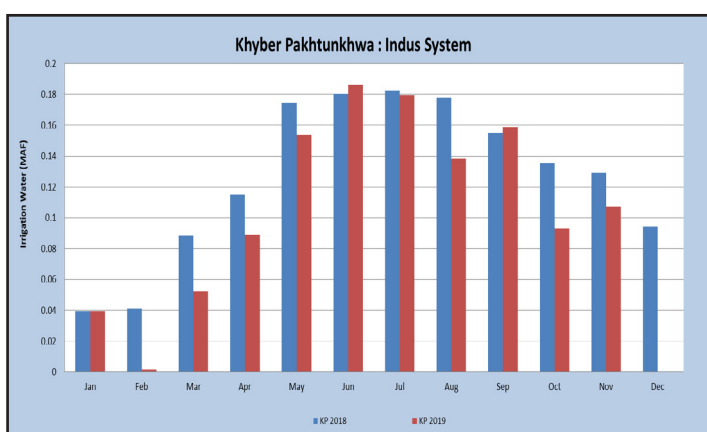
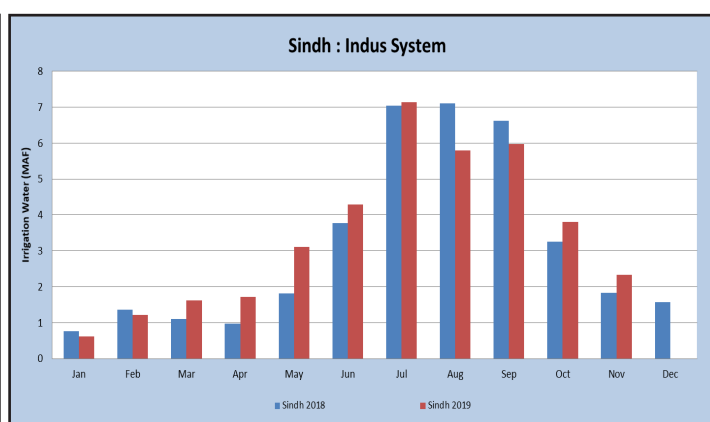
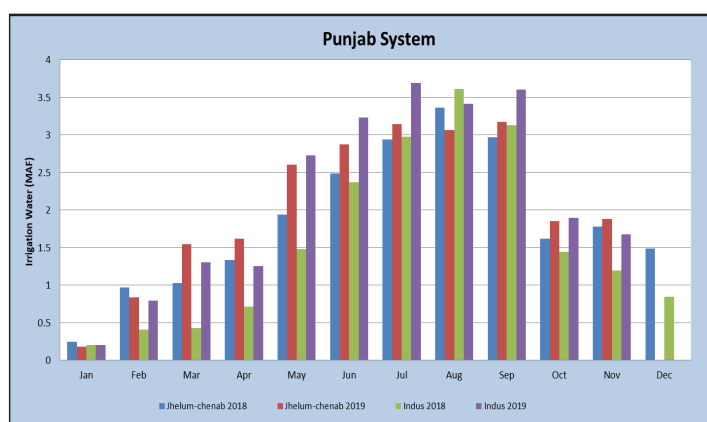


Irrigation Water Supply: November, 2019

The irrigation water supply during November 2019 was 6.222 MAF against the last year's supply of 5.153 MAF, higher by 1.07 MAF (20.75 percent). During November 2019, as compared to the same time period of last year, the supply in Punjab was 3.560 MAF (higher by 19.35 percent), Sindh was 2.329 MAF (higher by 27.19 percent), Khyber Pakhtunkhwa received 0.107 MAF (lower by 16.92 percent) while Balochistan received water supply of 0.226 MAF (higher by 7.55 percent).

Rabi 2019-20	Month	Year	Punjab			Sindh	Khyber Pakhtunkhwa	Balochistan	Total
			Jhelum-Chenab	Indus	Total				
			Million Acre Feet						
	Oct	2019	1.852	1.895	3.747	3.807	0.093	0.260	7.907
		2018	1.618	1.445	3.064	3.258	0.135	0.231	6.688
		Change	0.233	0.450	0.683	0.549	-0.043	0.012	1.22
		% change	14.43	31.11	22.30	16.85	-31.48	12.80	18.23
Nov	2019	1.882	1.678	3.560	2.329	0.107	0.226	6.222	
	2018	1.783	1.200	2.983	1.831	0.129	0.210	5.153	
	Change	0.099	0.478	0.577	0.498	-0.022	0.012	1.07	
	% change	5.56	39.83	19.35	27.19	-16.92	7.55	20.75	
Total	2019	3.734	3.573	7.307	6.136	0.200	0.487	14.129	
	2018	3.401	2.645	6.047	5.089	0.264	0.441	11.841	
	Change	0.333	0.928	1.260	1.047	-0.064	0.045	2.288	
	% change	9.78	35.07	20.84	20.57	-24.38	10.30	19.32	

Source: Indus River System Authority (IRSA)



Fertilizer Offtake

As per report of NFDC, the month of October 2019 started with opening inventory of 470 thousand tons of Urea. During October, domestic Urea production was 535 thousand tons with total availability of 1005 thousand tons. Urea offtake during October remained 119 thousand tons leaving behind closing balance of 887 thousand tons.

The opening inventory of DAP for October 2019 was 378 thousand tons. During October domestic production of DAP was 75 thousand tons. The total availability of DAP was 914 thousand tons which also includes 461 thousand tons of imported supplies. DAP offtake during October 2019 was 271 thousand tons leaving behind closing balance of 643 thousand tons.

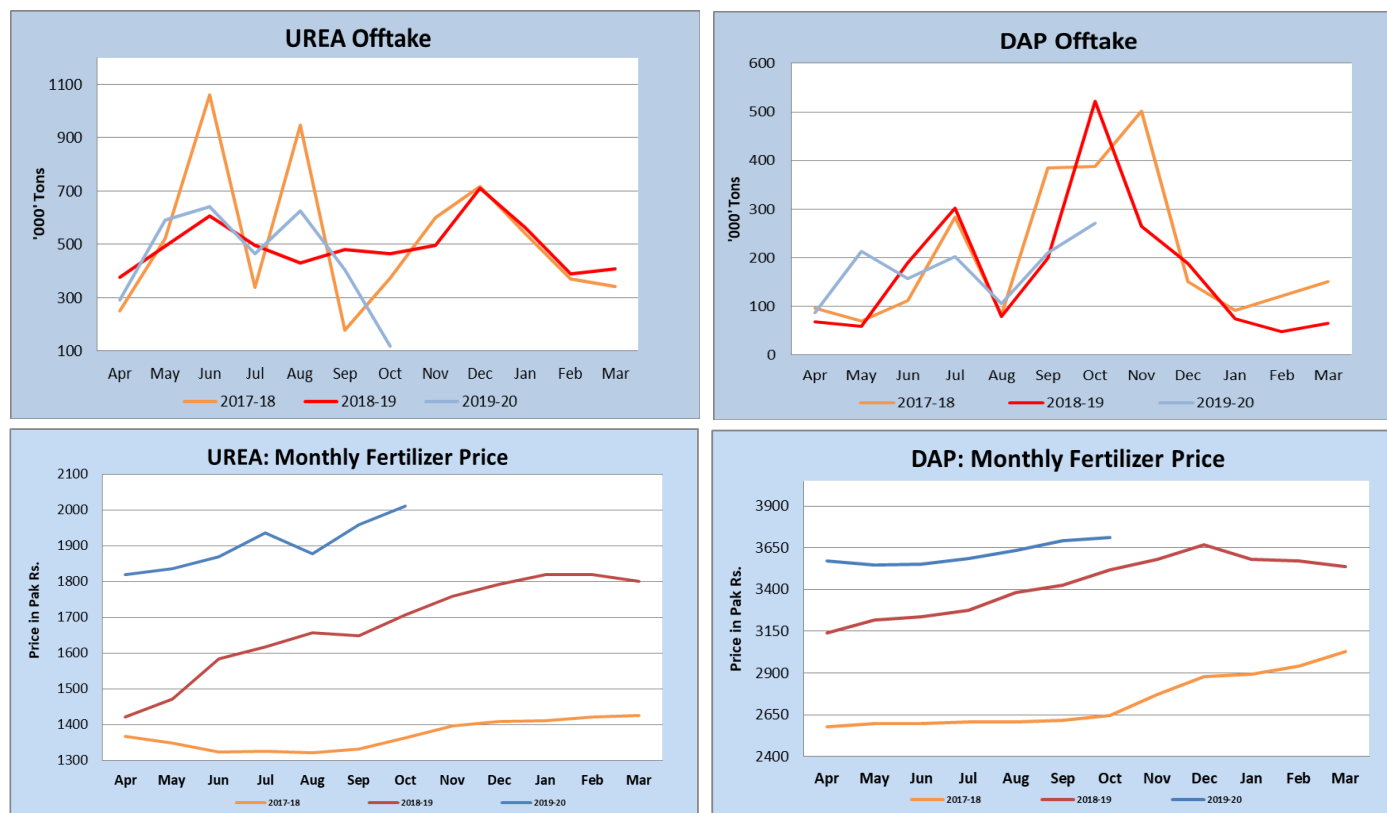
During October 2019, offtake of Nitrogen, Phosphate and Potash decreased by 62.9, 45.4 and 22.9 percent respectively.

Product	Opening Inventory	Domestic Production	Imports	Total Availability	Offtake	Write On/Off	Closing Balance
	000 Tons						
Urea	470	535	0	1005	119	1	887
DAP	378	75	461	914	271	0	643

Month	Fertilizer Offtake Rabi 2019-20				Fertilizer Offtake Rabi 2018-19				% Change			
	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total
	(000 Tons)											
Oct	122.4	140.7	5.0	268.1	330.0	257.7	6.4	594.1	-62.9	-45.4	-22.9	-54.9

Source: MRR.12/2019 NFDC

The fertilizer statistics and prices are depicted in the graphs below:



زرعی سفارشات

ماہ دسمبر

گندم:-

- 1- گندم کی بہتر پیداوار کیلئے 15 نومبر تک کاشت بہترین وقت ہے۔ اس کے بعد روزانہ تقریباً 15 تا 20 کلوگرام فی ایکڑ کے حساب سے پیداوار میں کمی آنا شروع ہو جاتی ہے۔ اس لیے زمیندار حضرات جلد از جلد گندم کی کاشت کو یقینی بنائیں۔ حتیٰ کہ گندم کی کچھیتی کاشت 15 دسمبر سے پہلے ہر صورت مکمل کر لیں۔ اور غیر معمولی تاخیر سے بچنے کیلئے جہاں ضروری ہو خشک بوائی کریں۔
- 2- گندم کی کاشت میں تاخیر ہونے کی صورت میں کچھیتی کاشت کے لیے موزوں اقسام کا انتخاب کریں۔
- 3- گندم کو مختلف بیماریوں سے بچاؤ کیلئے بیج کو بوائی سے پہلے پھپھوندی کش زہر لگائیں۔
- 4- گندم کو کالے تیلے سے بچانے اور خوردنی تیل کی پیداوار میں اضافہ کیلئے کینولہ/سرسوں کی کم از کم ایک قطارا ایکڑ کی ہر سائیڈ پر ضرور لگائیں۔

- 5- دھان کے بعد کاشتہ فصل کو 30 تا 40 دن بعد پہلا پانی لگائیں جبکہ دیگر فصلات کے بعد کاشتہ گندم کو 20 تا 25 دن بعد لازمی پانی لگائیں۔ پہلے پانی میں تاخیر سے شگوفے کم نکلتے ہیں اور ان میں تولیدی شگوفوں (Fertile Tillers) کا تناسب کم ہوتا ہے۔
- 6- پہلے پانی کے ساتھ ایک یوریا کی بوری فی ایکڑ لازمی ڈالیں۔ ریتیلی زمین ہونے کی صورت میں نائٹروجنی کھاد کا استعمال تر و تر حالت میں کریں تاکہ ضیاع کم سے کم ہو۔
- 7- جڑی بوٹیوں کی تلفی اچھی پیداوار کی ضمانت ہے۔ جڑی بوٹیاں 14 سے 42 فیصد تک پیداوار میں کمی کا باعث بنتی ہے۔ اس لیے کھیت کے معائنے کے بعد مناسب وقت پر جڑی بوٹی مارا دیات کا سپرے ضرور کریں۔
- 8- کیمیائی زہریں 100 سے 120 لٹرن فی ایکڑ پانی میں ٹی جیٹ نوزل کی مدد سے دوپہر کے وقت سپرے کریں۔
- 9- پہلی آبپاشی کے بعد کھیت و تر حالت میں آنے پر دوہری بارہیر و چلائی جائے۔ خواہ فصل چھلے کے ذریعے ہی کیوں نہ کاشت ہو۔ اس طریقے سے ایک طرف جڑی بوٹیوں کی تلفی میں مدد ملتی ہے اور دوسرا تر بھی دیر تک قائم رہتا ہے۔

کپاس:-

- 1- مکمل کھلی ہوئی کپاس کی چنائی جلد از جلد کریں تاکہ گندم کی جلد از جلد کاشت مکمل ہو سکے۔
- 2- چنائی پتوں پر سے شبنم کے قطرے سوکھ جانے کے بعد شروع کریں۔ اور چنی ہوئی کپاس کو خشک جگہ پر سوتی کپڑا یا ترپال بچھا کر ہر قسم کو علیحدہ رکھیں۔

- 3- آخری چنائی سے بیج کا انتخاب ہرگز نہ کریں کیونکہ اس کا ریشہ کمزور اور بنولہ بیج کے قابل نہیں ہوتا۔
- 4- کپاس کی چنائی، ترسیل اور سنوڑتج کے دوران پٹ سن یا پولی پرائیملین ہرگز استعمال نہ کریں۔ جہاں ضرورت ہو سوتی کپڑا استعمال کریں۔
- 5- نمی کی صورت میں کپاس کو باہر دھوپ میں خشک کر کے پھر سنوڑ کریں۔
- 6- گلابی سنڈی کی تلفی کے لیے آخری چنائی کے بعد کھیت میں جانوروں کو کھلا چھوڑ دیں تاکہ کھیت میں موجود باقیات کو کھا جائیں۔
- 7- زمین کی زرخیزی میں اضافہ کے لیے چھڑیوں کو روٹاویٹر کے ذریعے زمین میں دبا دیں۔

دھان:-

- دھان کی برداشت میں تاخیر کرنے سے دانوں کے جھڑنے اور ٹوٹنے کا خطرہ بڑھ جاتا ہے۔ اس لیے دھان کی بروقت کٹائی اور پھنڈائی اچھی پیداوار کے لیے ضروری ہے۔
- 2- موسمی اثرات سے محفوظ رکھنے کے لیے رات کے وقت مونچی کی ڈھیری کو پرالی یا ترپال سے ڈھانپ دیں۔
- 3- ذخیرہ کرنے سے پہلے مونچی کو خشک کرنا ضروری ہے۔ ورنہ کیڑوں سے نقصان کا اندیشہ زیادہ ہوتا ہے۔

کما د:-

- 1- عام طور پر فصل کی کٹائی زمین کے اوپر سے کی جاتی ہے جو کہ مونڈھی فصل کی لیے نقصان دہ ہوتی ہے۔ فصل کو زمین سے ایک انچ گہرائی سے کاٹیں۔ اس سے زیر زمین پوریوں میں موجود آنکھوں کو زیادہ صحت مند ماحول میسر آتا ہے۔ اور منڈھوں میں موجود گڑوؤں کی سنڈیوں کو تلف کرنے میں مدد ملتی ہے۔
- 2- مونڈھی کاشت کا ارادہ نہ ہو تو کما د کی جلد از جلد کٹائی کر کے دیگر فصلات کی کاشت کریں۔
- 3- سیلاب، چوہے کے حملے اور گرنے کی صورت میں متاثرہ فصل کو پہلے کاٹیں۔
- 4- کٹائی سے 20-25 دن پہلے آبپاشی دینا بند کر دیں۔
- 5- کما د کی کٹائی اس وقت کریں جب چھینی کی بافت عروج پر ہو۔ سب سے پہلے مونڈھی پھر ستمبر کاشتہ اور آخر میں بہاریہ فصل کی کٹائی کریں۔ اس طرح چھینی کی ریکوری زیادہ ہوگی۔
- 6- کہر کی صورت میں فصل کو ہلکا پانی لگا دیں۔
- 7- مونڈھی فصل رکھنے کا ارادہ ہو تو کما د کو 15 جنوری کے بعد کاٹیں۔
- 8- بیماریوں اور کیڑوں سے محفوظ فصل سے بیج حاصل کریں۔
- 9- کما د کاٹنے کے بعد جلد از جلد مل کو سپلائی کریں تاکہ وزن اور ریکوری میں کمی نہ آئے۔



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