Government of Pakistan

PAK-SCMS BULLETIN

PAKISTAN: SATELLITE BASED CROP MONITORING SYSTEM

SUPARCO

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Prelude:

SUPARCO, the National Space Agency of Pakistan, has developed algorithms, techniques and procedures for fast track release of reliable and reproducible information on agriculture. FAO, UN is contributing in improvement of this bulletin through provision of technical advice. The other organizations collaborating in this endeavor are:

- Pakistan Meteorological Department (PMD)
- Provincial Crop Reporting Services (CRS)
- National Fertilizer Development Center (NFDC) and
- Indus River System Authority (IRSA).

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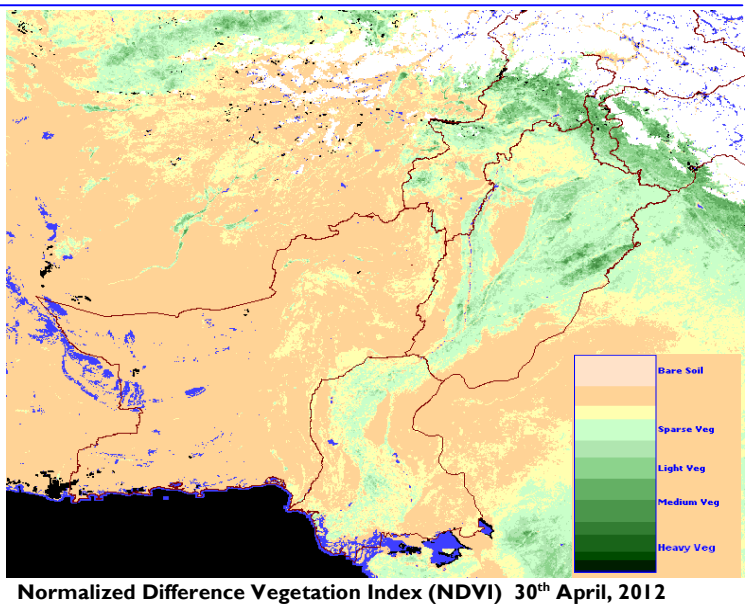
Crop Situation: April, 2012

Tharparkar, the southern outskirts of Pakistan, comprising of Mirpurkhas, UmerKot and other areas, is apparently the gateway of cropping seasons in Pakistan. The harvesting of wheat in this region starts at the end of February. The harvest operations progress northwards as the season warms up. The span of wheat harvesting time in areas between UmerKot in Sindh to Peshawar in KP is around 100 days. The harvest operations move upcountry by about 10-15 km a day from southern to northern extremity of the country.

The harvest of wheat crop this year has been delayed by about 15 days, owing to prolonged cool temperature regimes. About 90 percent of wheat crop, in lower Sindh, was harvested by end of March, about 80 percent in Potohar region of Punjab, 60-70 percent in upper Sindh and peripheral areas upto Bahawalpur. In central Punjab, the harvesting will gain momentum in early May and in Peshawar valley during later part of this month.

It is recapitulated that the analytical techniques used for estimation of crop area include (a) classification of multi date, wall to wall satellite imagery of 5 m resolution of the Area of Interest (b) area frame system, designed on stratified/probability proportion based sample designing, drawn on 5 m satellite imagery. The crop yield and production estimates are based on the data across the growing season of the crops. These include 10 daily satellite VGT indices of 1000 m resolution along with ground information on daily agro-meteorological parameters, 10 daily irrigation water deliveries in canals and monthly fertilizer off take.

The wheat crop 2011-12 production is estimated at 24.030 million tons, lower by 1.184 million tons from last year's crop of 25.214 million tons. This short fall in production of wheat is two pronged: a decrease in area in Punjab along with a decline in crop yield. A set of multiple factors influenced wheat crop growth during the season. These include ponding of flood waters in Sindh from monsoon, remarkably cool winter leading to stunting of the crop, snags in supply of fertilizers and irrigation water and extended dry winter in areas stretching from central Punjab to coastal region of Sindh.



Normalized Difference Vegetation Index (NDVI) 30th April, 2012

Pakistan, during the year 2011-12, established new bench marks in cotton production. The crop size, as reported by Pakistan Cotton Ginning Association (PCGA), was 14.7 million bales. This is despite a damage of 2.6 million bales, by floods, in Sindh, This promising upshot became doable with articulate and perpetual research work to manage viral and bollworm impediments. The customary cotton crop sowing season comprises of the months of May-June in Punjab and April-May in Sindh. However about 10 percent of the crop is sown early than the norms of the sowing season, for obviously diverse reasons including the threat of the curl virus and increased cash flows from the follow-on higher crop productivity.

The sugarcane crop 2011-12 was another landmark, reported at 70 million tons by SUPARCO. This year's crop has been sown viz. in September for Sindh and February-March for Punjab, KP and in some parts of Sindh.

Spring maize, a high tech crop, sown by hybrid seeds, with demanding farm management, is planted in February, mainly in Sahiwal Division, and the peripheral areas in Faisalabad, Kasur and Chiniot districts. Pind Dadan Khan tehsil in Jehlum district also grows this crop, by pumping water from the subsurface sweet aquifer, incessantly rechargeable, from fresh water inflows from river Jehlum. The other maize growing areas as Potohar, Northern KP, AJK and GB grow an upland (rainfed) crop in autumn season. The farmers in these areas, for want of ample water supplies, generally use synthetic seeds, with matching medium to low level of farm management. The productivity of spring maize is three to four fold than the upland autumn crop.

Satellite Systems and Technology:

The techniques used for estimation of crop area include (a) crop forecast based on MODIS (Moderate Resolution Imaging Spectroradiometer) data (b) Satellite Image classification by Gaussian Maximum Likelihood Technique (GMLT) and (c) Area Frame Sampling design.

The crop forecasting information during the month of February was based on the rapid information of the medium resolution data of 250 m from MODIS sensors on board Terra and Aqua satellites for crop area. For image classification, SUPARCO developed agriculture masks of Pakistan and multi-date imagery of the Areas of Interest (AOI) was acquired at 4 weeks and 8 weeks after emergence of crop. The spectral signatures were developed from training samples, and supervised image classification was carried out by GMLT. The area frame sampling technique was designed, using 5 m resolution satellite imagery for maximum plant cover during the months of February and September. The surface cover features were apportioned into various strata and 30 ha samples called "segments" were, drawn in each stratum based on probability proportion in various polygons. In all, 366 samples were drawn across Pakistan viz .Punjab 203, Sindh 94, KP 44 and Balochistan 25. The data on crop area were reconciled through the above systems.

The crop yield and production estimates are based on modular approach drawn from (a) Satellite Data of the Area of Interest (AOI) from Spot VGT 1000 meter resolution (b) Agro-meteorological data (temperature_max-min, rainfall, sunshine hours) from 42 met stations across the country from PMD[1] (c) Fertilizer off take information from NFDC[2] and canal water withdrawals from IRSA[3].

Crops Situation:

Wheat Crop

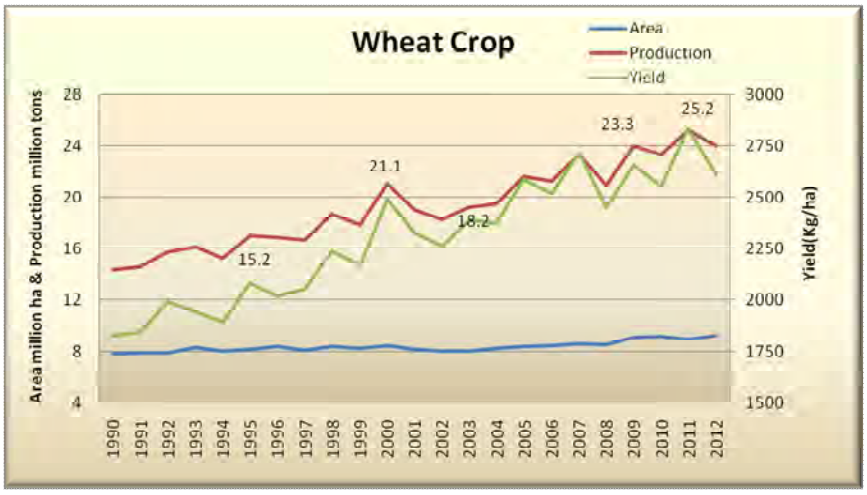
The temperatures favoring mitosis, a cell division process, responsible for crop growth and differentiation in wheat crop, range between 4° C to 37^0 C. The crop development is hampered across both these limits. The number of days during the period from November 2011 to April 2012 at various stations, with less / more than these threshold temperatures, were as follows:

Province	Station	No of days between November 2011 –April 2012 with temperature					
		Less than 4^{0}C			More than 37^{0}C		
		2011-12	2010-11	percent difference	2011-12	2010-11	percent difference
Punjab	Rawalpindi	60	58	3	0	4	-100
	Sargodha	56	31	81	5	9	-44
	Lahore	55	40	38	6	11	-45
	Faisalabad	58	34	71	3	9	-67
	Multan	34	19	79	8	16	-50
	Bhawalpur	24	31	-23	11	17	-35
	Average	47	35	34	5	11	-55
KP	Peshawar	63	53	19	2	6	-67
	D I Khan	55	45	22	3	9	-67
	Average	59	49	20	2	7	-71
Sindh	Jacobabad	5	7	-29	17	22	-23
	Nawabshah	7	18	-61	35	40	-13
	Sukkur	13	18	-28	19	21	-10
	Larkana	15	11	36	24	26	-8
	Average	10	13	-23	24	27	-11
Balochistan	Quetta	109	133	-18	0	0	0
Pakistan	**Average**	43	38	13	11	15	-27

The temperature regimes during growing season of Rabi crops usually remained cool across Pakistan including a severe cold wave on 7-8th February in Sindh, damaging sensitive and vulnerable crops. In Punjab the number of cool nights below 4^{0}C was significantly higher than last year.

1: Pakistan Meteorological Department
2: National Fertilizer Development Center of Planning Commission of Pakistan
3: Indus River System Authority

This resulted in stunting of crop up till end of February. These low temperature regimes rallied round to prolong crop growth period. The improvement in diurnal temperatures in March provided a stimulus to reverse the crop stunting process. The crop showed dynamic and rapid growth during March and April. The maximum temperatures in these two months above 37 ^{0}C were also lower than last year. Other governing factors responsible for / impeding crop growth during the season include lingering dry season, an increase in early sown cotton in Southern Punjab, the holdup supply of fertilizer particularly phosphates and irrigation water. The historical pattern of wheat crop area and production has remained as follows:

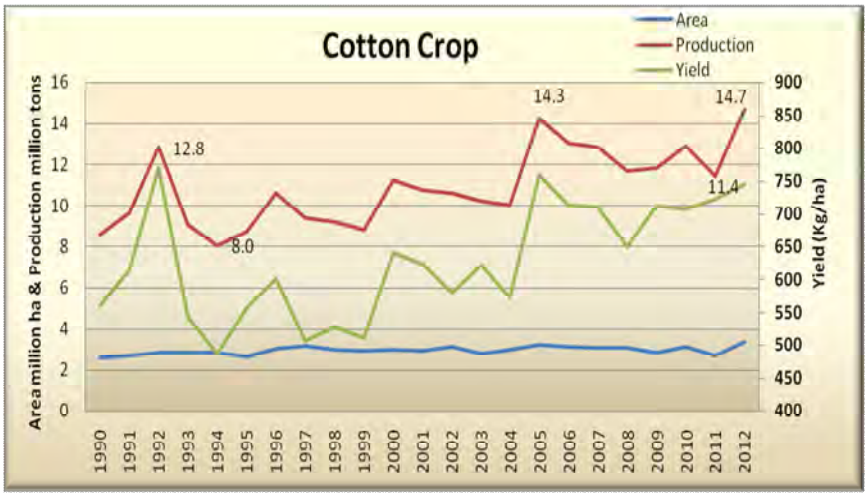


The harvests of wheat crop this year have been delayed almost all over the country by about 15 days, owing to prolonged cool weather. By end of April, the wheat harvests in lower Sindh have been completed by 90 percent and in Potohar region of Punjab by about 80 percent. About 60-70percent of wheat has been harvested in areas of Upper Sindh/Southern Punjab from Shaheed Benazirabad Abad to Bahawalpur. Similar is the situation in Southern parts of KP and in Pat Feeder area of Balochistan. The wheat harvesting has lately started in areas of Punjab from Multan to Lahore, covering about 15-25 percent of the crop. The harvesting in these areas will pick momentum in early May. The harvesting between Lahore to Gujrat has not started, so far. It will begin in early May. The harvesting in Peshawar valley of KP is late by design and will start in later part of May. Most of the wheat harvesting operations in the country will be over by end of May.

The size of wheat crop 2011-12 is likely to be short than last year because of decrease in area and lower yield on account of multiple factors already explained. Notwithstanding these, Pakistan is still likely have a wheat crop around 24 million tons.

Cotton Crop

The incidence of cotton leaf curl virus was initially noted in the village "Khokhran" near Multan during 1988. The disease gathered a massive economic dimension subsequently, nose-diving the sectoral growth during the year 1993-94 to 8 million bales. From 12.8 million two years ago. Pakistan continued to be victimized by the disease for about 20 years. Given this dilemma, the survival of textile sector, at one time, seemed intimidated. The country, at a rate of 2-3 million bales a year, has endured huge economic loss of about Rs. 300 billion. The cotton production pattern during 1990s and onwards was as follows.



The graph shows an erratic crop production behavior with frequent dips and peaks set in motion by the disease and insect flare up.

The research in cotton has focused to combat the challenge of the disease and also increase crop productivity. This included (a) an emphasis on cotton breeding to install resistance against the Leaf Curl Virus (CLCuV), (b) promotion of Good Agricultural Practices (GAP) by minimizing/ rationalizing the use of toxins to protect farmers' friendly predators and (c) develop insect resistant plant genotypes. Identical spotlight was also placed on meeting the obligation of textile standards with following guideline.

S.No	Textile standards for Cotton Breeding[4]	
	FIBER TRAITS	STANDARDS
1.	Staple Length (mm)	28 and above
2.	Lint Percentage	37.5 and above
3.	Micronaire (µg inch^{-1})	3.8 to 4.9
4.	Fiber Strength -thousand pounds per sq inch (tppsi)	92
5.	Uniformity Ratio (percent)	48
6.	Fiber Maturity (percent)	80

The challenging work on cotton breeding has become rewarding in three folds. Firstly, the cost of pesticides has gone down from Rs. 12.6 billion tons during 2004 to almost less than half in subsequent years. This became possible by developing systemic resistance in cotton plant against detrimental insects particularly bollworms. Secondly, Punjab that had been the principal seat of CLCuV incidence produced record crop of about 12 million bales during the year 2011-12, in an environment almost free of curl virus attack. This is 53.5 percent higher than last year's production of 7.81 million bales. Thirdly the ginning percentage of cotton has increased from 35 percent to around 40 percent along with meeting other textile standards. This success is illustrious but the task is not yet over. The insects and diseases have a capacity to mutate and invalidate the inbuilt plant resistance instituted. The research system in Pakistan has to be vigilant to manage the recurrence of this catastrophe.

Notwithstanding, the farmers' cash flows last year suffered as the cotton prices halved to Rs. 2200-2700 per 40 kg than last year and urea prices doubled over previous year. The cotton crop in Sindh, typically concentrated on the left bank of Indus, was damaged by rains and floods 2011. Pakistan produced about 14.7 million bales of cotton despite a loss of 2.6 million bales of cotton in Sindh by floods.

The sowing of cotton crop 2012-13 is in progress. About 25 percent of the crop in Sindh and 10 percent of the crop in Punjab has been sown. The sowing will gain momentum in May in the aftermath of wheat crop and will be completed in June.

The cotton is trading at 99 cents per lb to 87 cents per lb in the New York cotton future market. Up to mid March. Thereafter some surge was noted in cotton future rates touching Cents 91.23 per lb in April. The rates of cotton are as follows:

New York Cotton Market		
Contract	Future Price	Trading Month
	Cents/lb	
1st Feb,2012	93.39 94.79	March,2012 May,2012
10th Feb,2012	99.75	Dec,2012
14th Feb,2012	92.25 92.84	March,2012 May,2012
01st March,2012	88.46 89.67	March,2012 May,2012
14th March,2012	87.34 88.01	May,2012 July,2012
21st March,2012	88.31 89.08	May,2012 July,2012
27th April, 2012	89.23 91.23	May.2012 July,2012

*** Source : Pakistan Central Cotton Committee, Karachi**

4: **Source:** 53rd meeting of the Special Experts Sub-Committee of the Punjab Seed Corporation held on 06.02.2007 at, Lahore, Pakistan

Sugarcane Crop

The area and production of sugarcane and manufacturing of sugar[5] over last 10 years was as follows.

Year	Area	Yield	Production	Cane Crushed	Sugar Produced	Sugar Recovery
	million ha	tons/ha	million tons	million tons	million tons	Percent
2001-02	1.0	48	48.0	36.7	3.2	8.7
2002-03	1.1	47	52.1	41.8	3.7	8.7
2003-04	1.1	50	53.4	43.7	4.0	9.2
2004-05	1.0	49	47.2	32.1	2.9	9.1
2005-06	0.9	49	44.7	30.1	2.6	8.6
2006-07	1.0	53	54.7	40.5	3.5	8.7
2007-08	1.2	52	63.9	52.8	4.7	9.0
2008-09	1.0	49	50.0	33.1	3.1	9.5
2009-10	0.9	55	49.4	34.6	3.1	9.1
2010-11	1.0	56	55.3	44.5	4.1	9.3

It is a high delta crop requiring huge application of irrigation water. The crop in KP, Punjab and in some parts of Sindh is sown in February-March. This crop has a minimal growing period of 10 months. This period extend up to 14 months as crushing of cane continues up to March. The water requirement of this crop is about 6 acre feet. In large parts of Sindh, sugar cane is a sown as a mixed /inter crop with onion and other high value crops including fodders in September. The minimum growing period of this crop is 14 months and with crushing season continuing, this period extends up to 18 months. The water requirement of this crop is about 8 acre feet. Sindh is therefore producing more sugar per unit area than Punjab and KP, owing to (a) high crop productivity and (b) high sugar recovery.

Sugarcane is a highly speculative crop with wild fluctuations in crop area over years, based on procurement prices offered by sugar mills. The area under sugarcane increased substantially in succeeding years after farmers got lucrative prices. This trend was instantly upturned when farmers got apathetic prices.

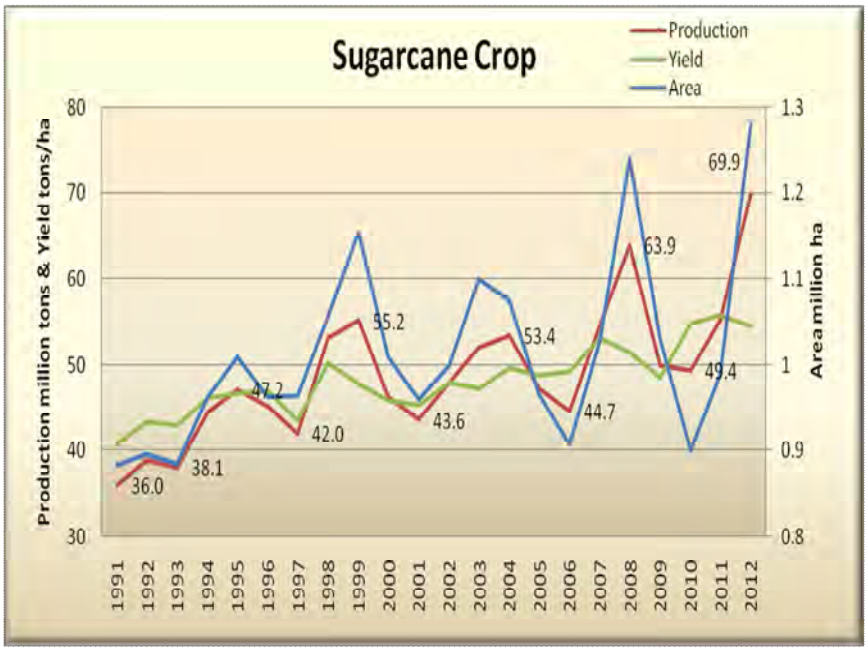
The annual[6] per capita consumption of sugar based on balance sheet method is as follows.

Parameter	Row #	Units	2000	2005	2007	2009
Carryover stocks on 1- Oct	1	Thousand tons	27	578	986	900
Sugar produced	2	Thousand tons	3016	2999	4752	3100
Imports	3	Thousand tons	633	1593	28	505
Exports	4	Thousand tons	-	47	28	-
Carry forward stocks	5	Thousand tons	621	1311	1189	334
Total consumption[7]	6	Thousand tons	3055	3812	4549	4171
Population on Apri-1 next year	7	Million persons	145.64	163.15	173.3	179.84
Per capita availability of sugar[8]	8	Kg per annum	20.98	23.37	26.25	23.19

The average sugar consumption is about 23.5 kg per person. At this rate the sugar requirement for a population of 185 million during the year 2012-13 would be around 4.35 million.

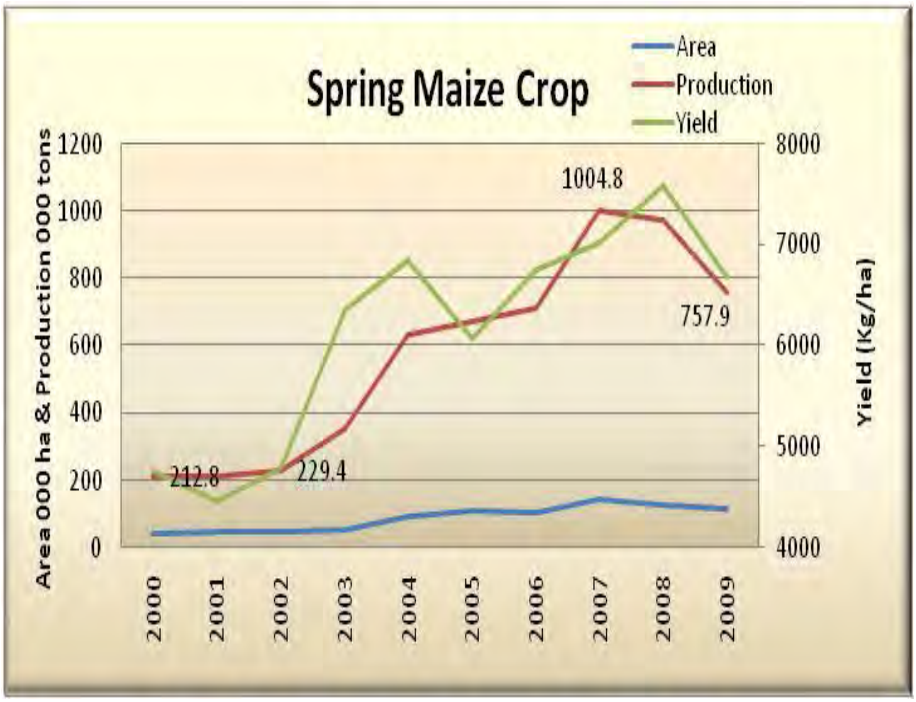
The graphic presentation of sugarcane area, yield and production since 1990s is given overleaf. The wild fluctuations in the area of the crop are triggered by profitable prices, followed by crashing prices in subsequent years. This shows an erratic behavior of the crop and an inconsistent supply of cane over years.

5: Source: Ministry of Food and Agriculture and Pakistan Sugar Mills Association
*Curtsey of Agriculture Policy Institute, Federal Ministry of Food Security and Research
6: The sugar year starts on 1-Octber and terminates on 30-September next year
4: Row 6 = (Row 1+ Row2+Row3) -(Row 4+ Row5)
8: Row 8 = Row 6/ Row 7*1000



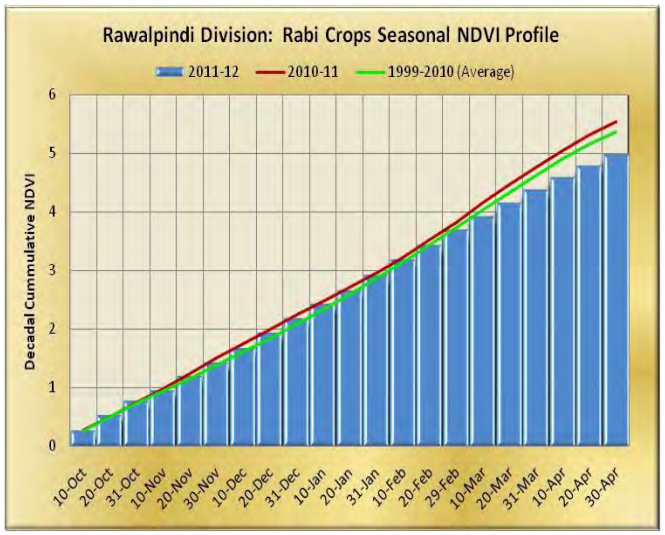
Spring Maize Crop

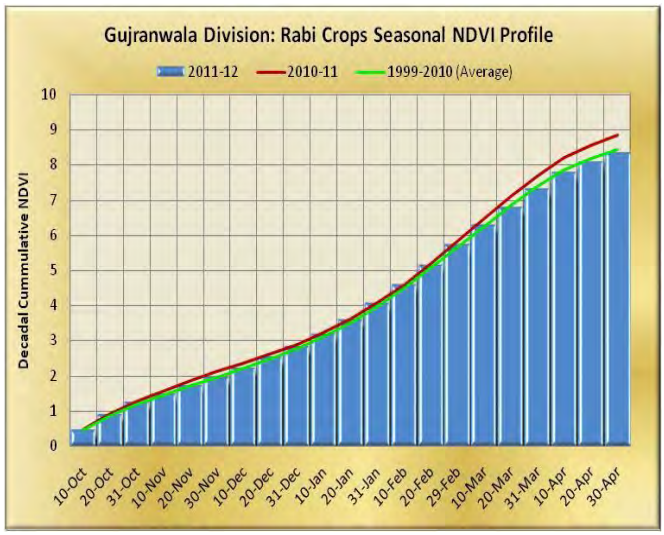
The maize crop is sown in KP, GB, AJK and Punjab. Two crops of Maize crop are sown in Pakistan viz. autumn crop is sown in July and August and spring crop is sown in February. The irrigated crop mainly in Punjab is sown by hybrid seeds and the upland crop, in other parts of the country, is sown by synthetic seeds. The yield of hybrid maize is 50-80 % higher than synthetic maize. The obvious reason for this difference is the high genetic potential of hybrids with ensuing intensive management for fertilizer, plant protection and other factors of production. Spring maize is mainly concentrated in Sahiwal division, and its peripheral areas in Faisalabad, Kasur and Chiniot districts.

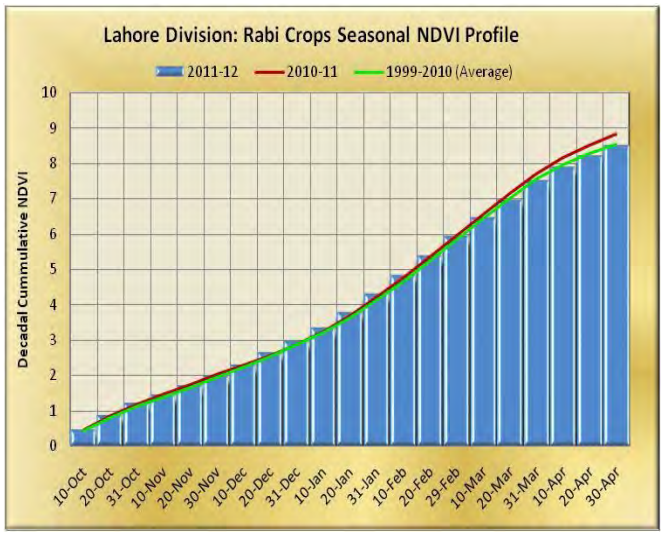


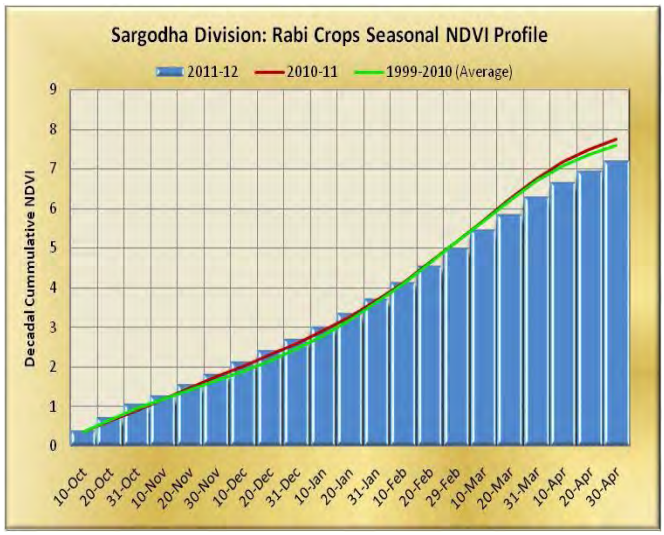
Normalized Difference Vegetation Index (NDVI): Crop Growth Profile at Divisional Level

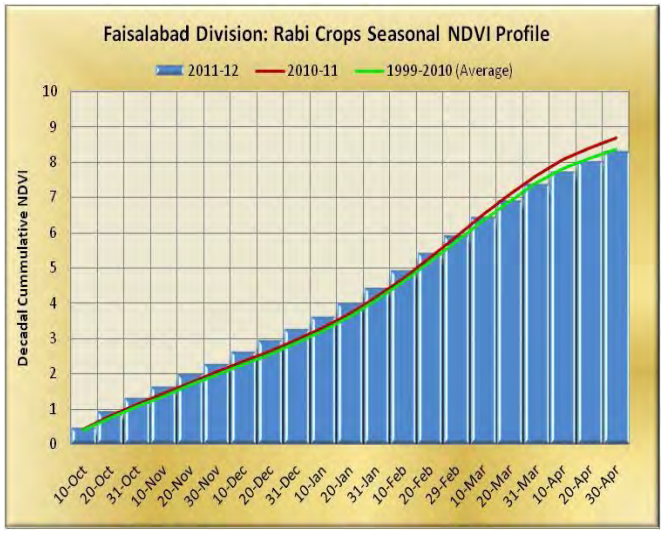
SUPARCO is continuously acquiring MODIS 250 m resolution data on daily basis and SPOT VGT data on 10 daily basis to assess crop growth. SPOT-5 high resolution data are being acquired during each cropping season to assess land surface changes in image classification. The graphs depicting temporal changes for various regions are as follows:

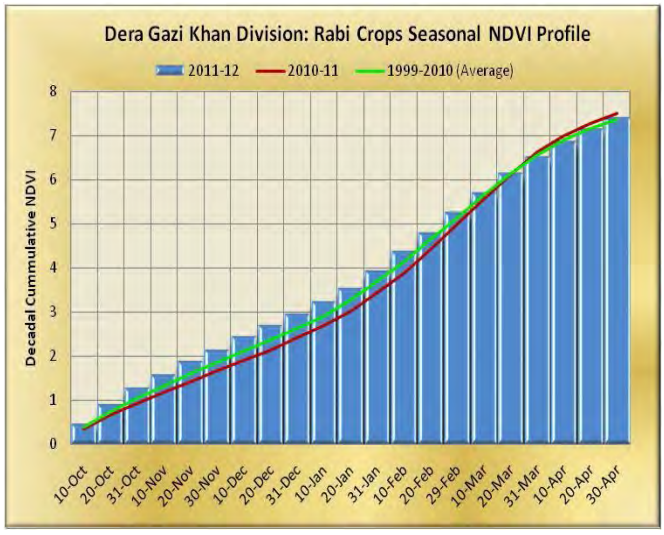




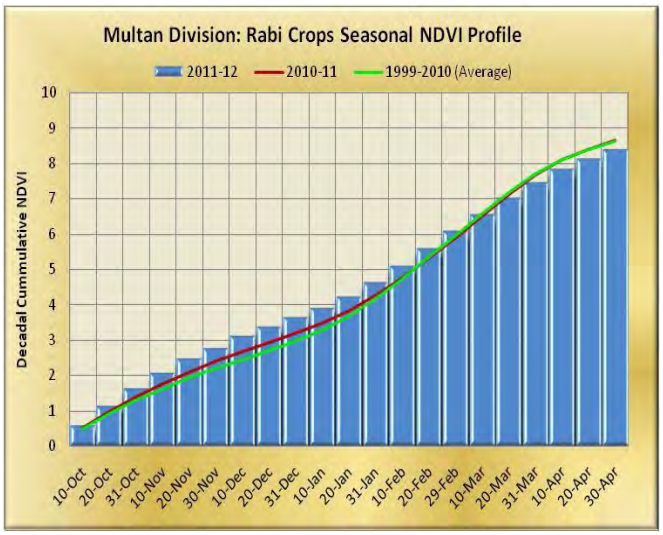


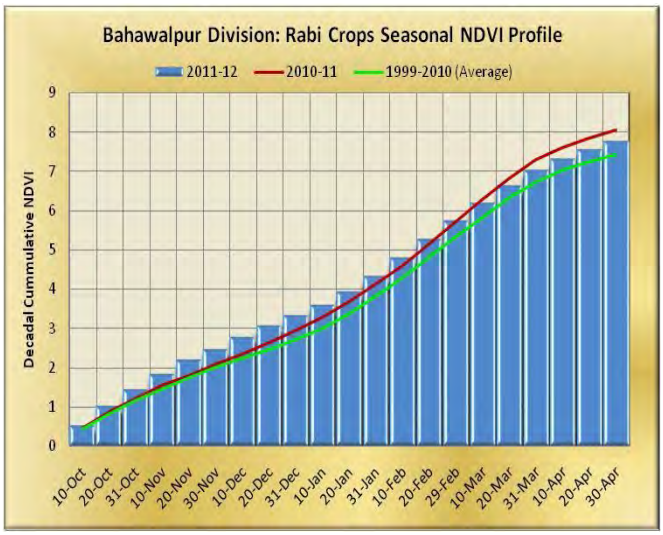


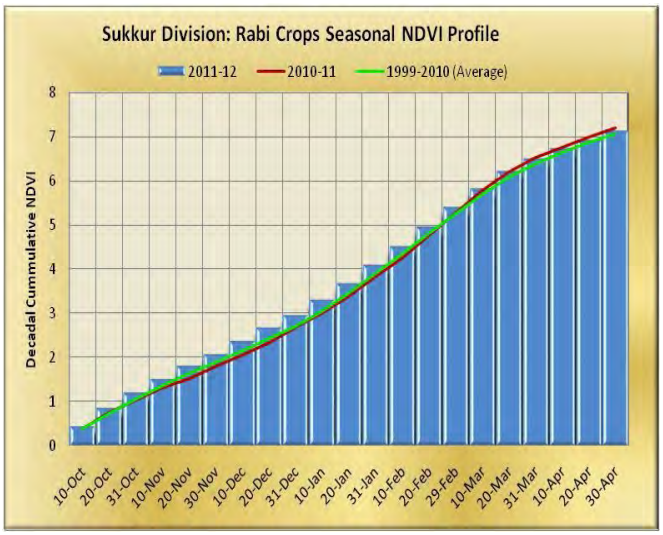


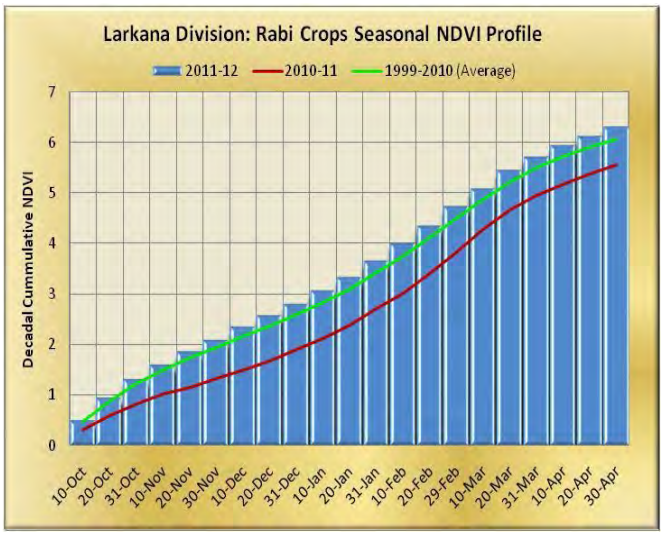


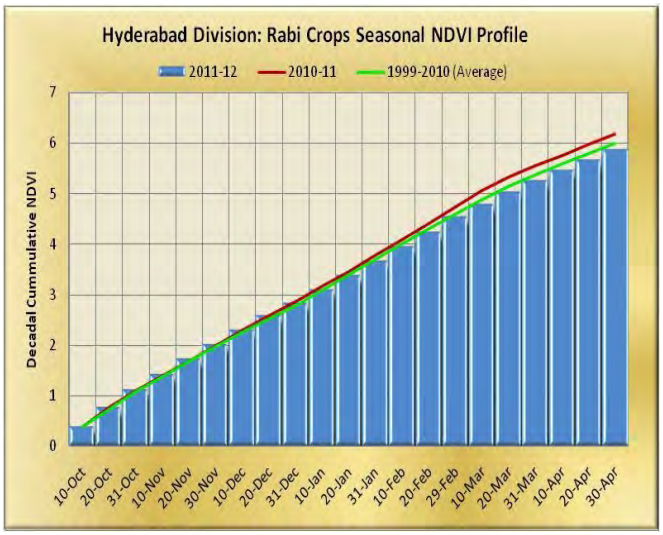
Normalized Difference Vegetation Index (NDVI): Crop Growth Profile at Divisional Level

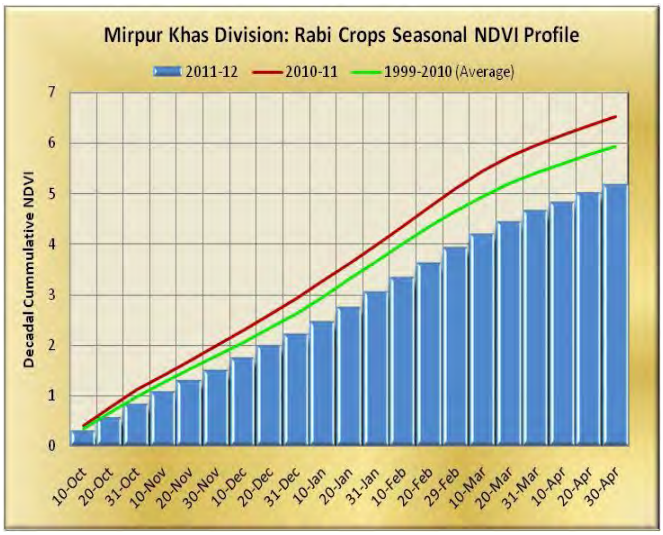




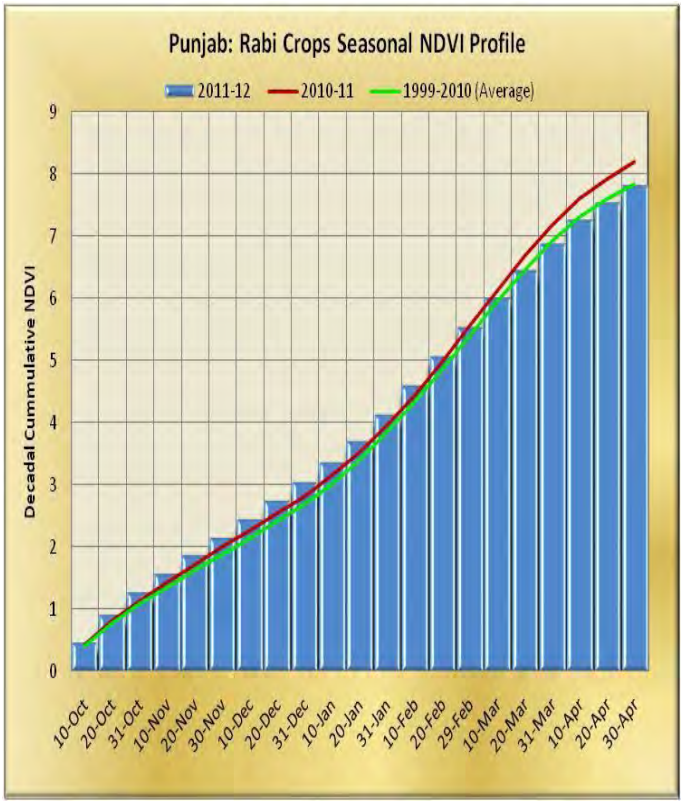


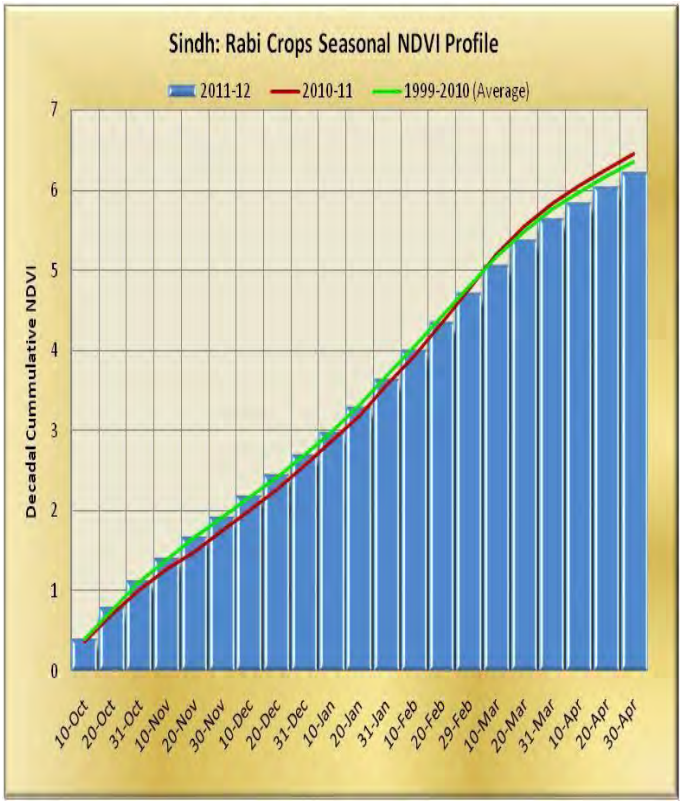


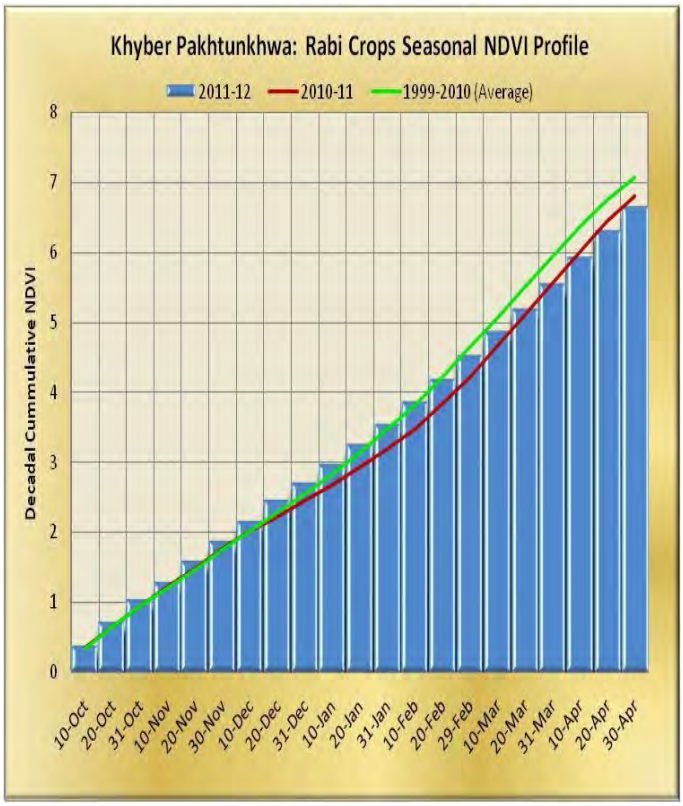


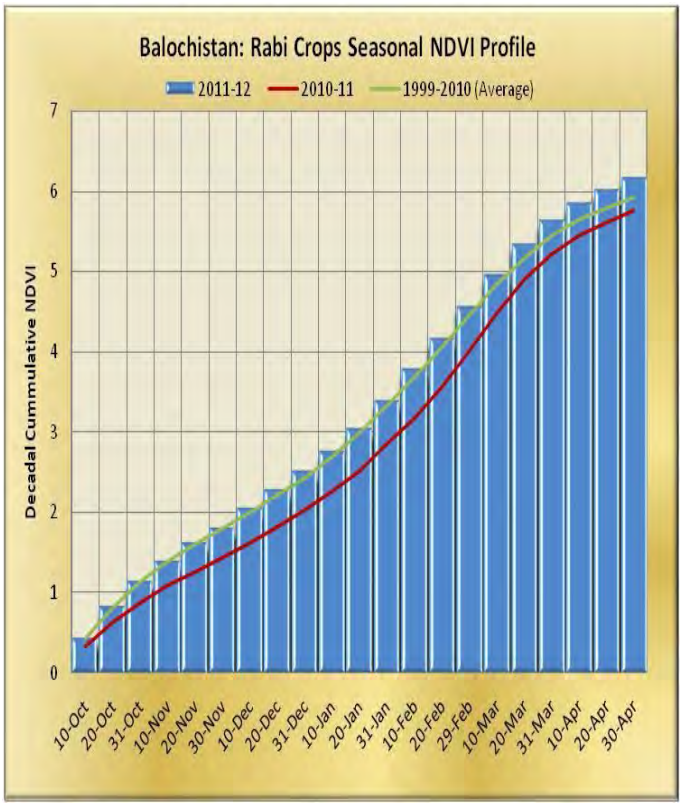


Normalized Difference Vegetation Index (NDVI): Crop Growth Profile at Provincial level

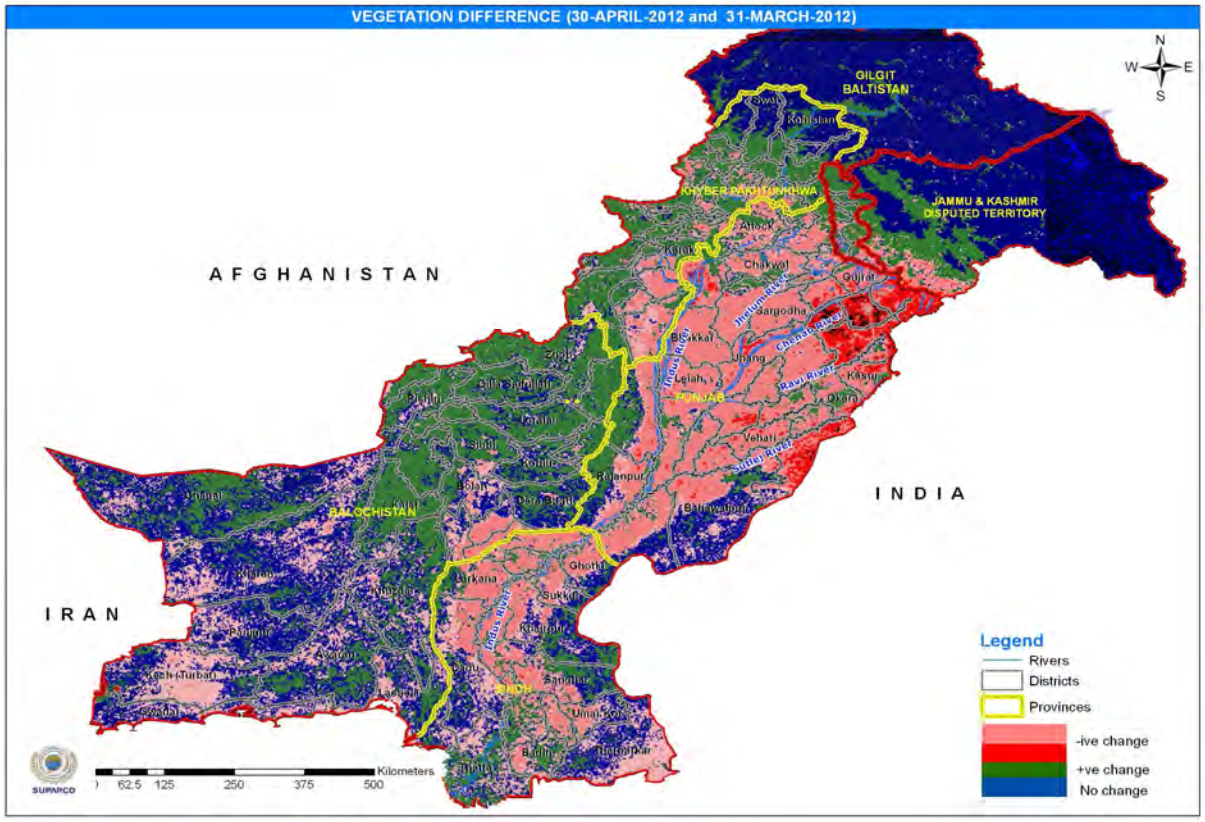




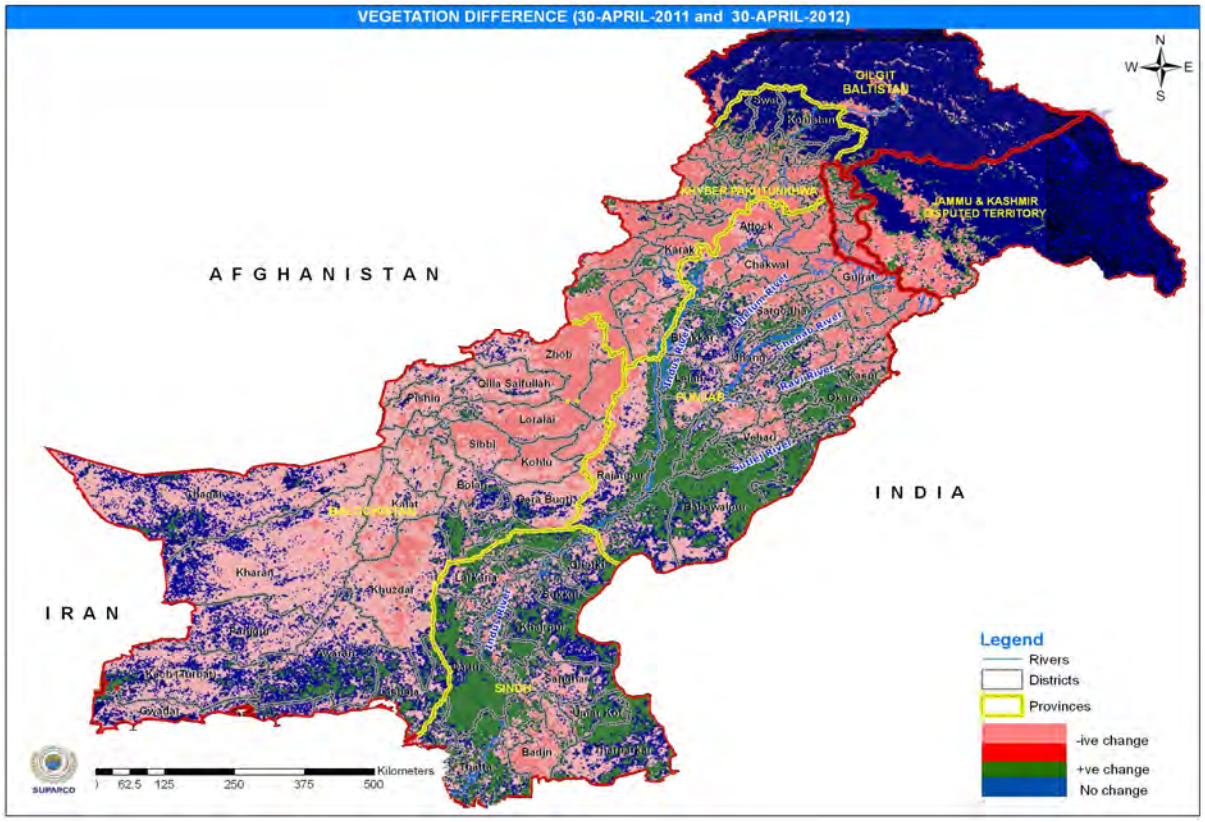




Vegetation Change in April, 2012



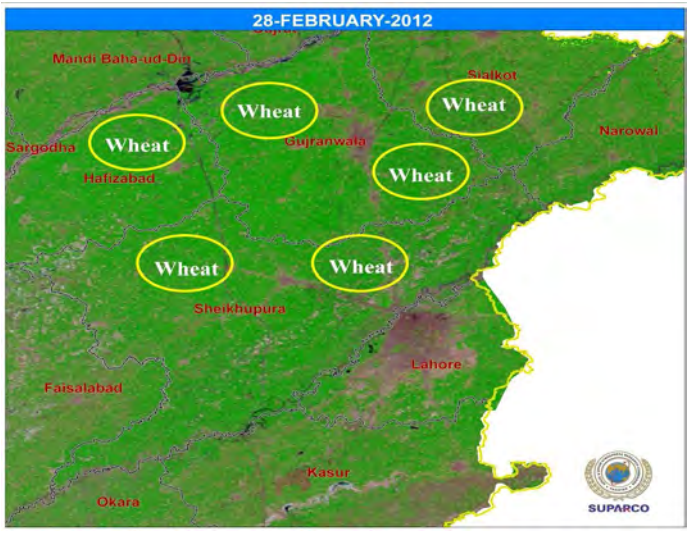
Vegetation Change 2012 vs. 2011 during April

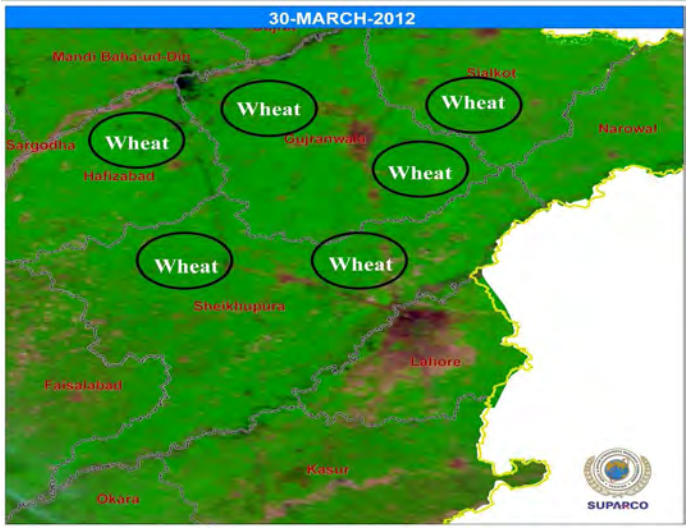


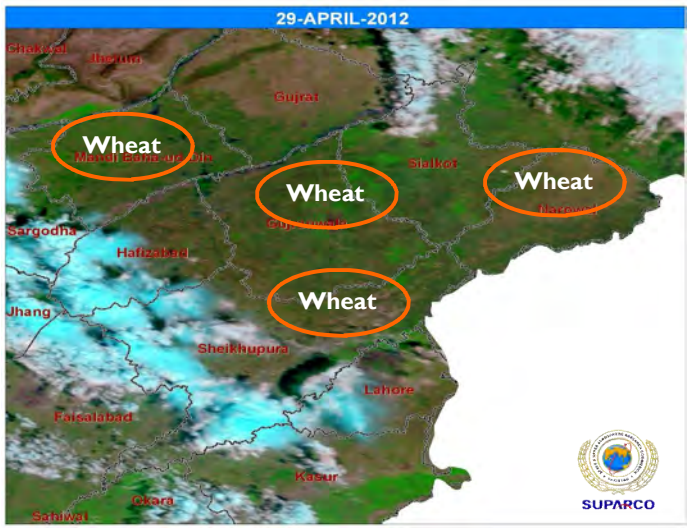
Satellite Imagery: SPOT VGT 1000m

Temporal Change: Kallar Tract, Punjab



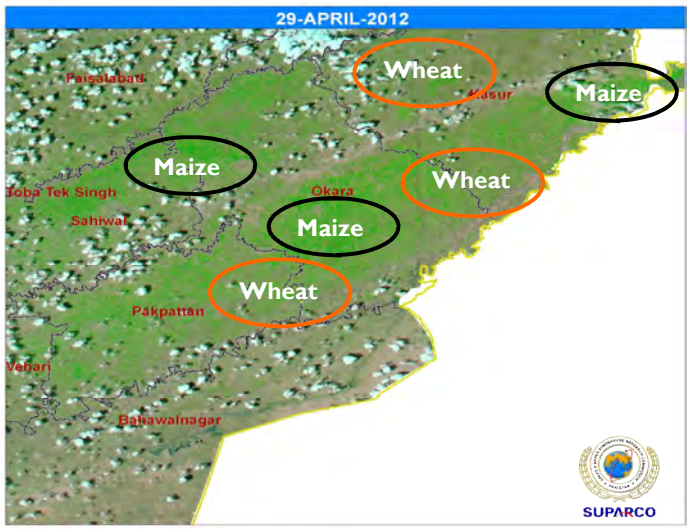






Temporal Change: Sahiwal Division, Punjab

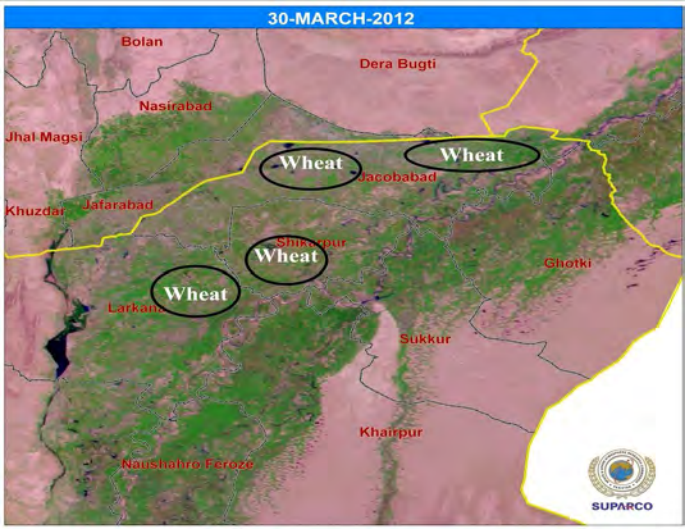


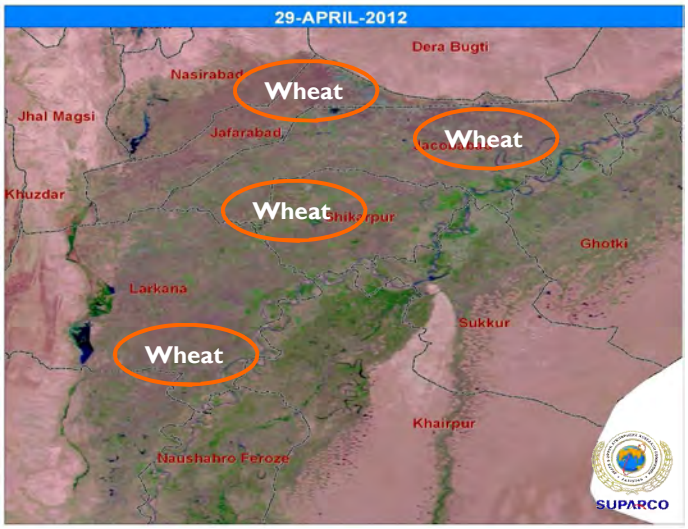


Sowing/Land preparation | Active Growth | Maturity | Harvesting

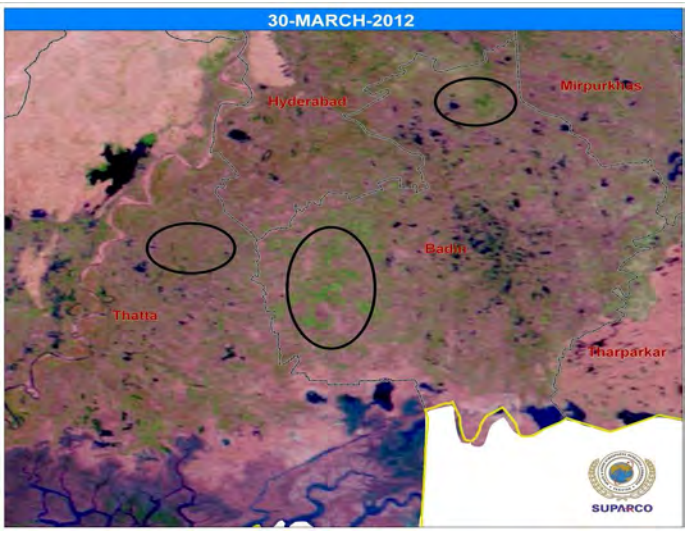
Satellite Imagery: MODIS 250m

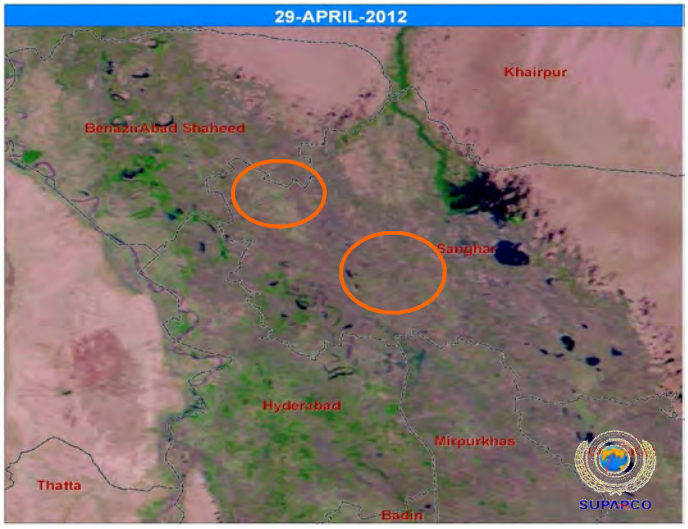
Temporal Change: Wheat in Larkana Division, Sindh



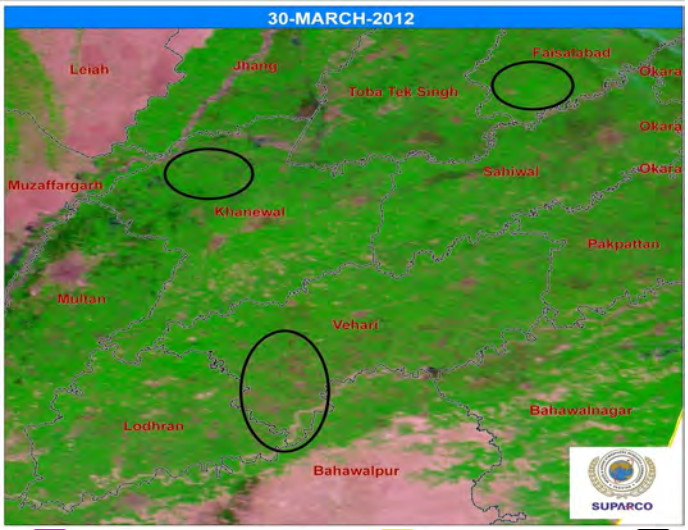


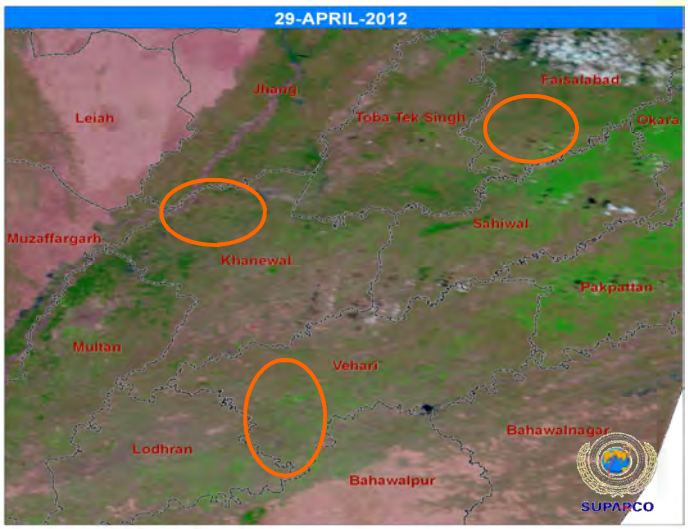
Temporal Change: Wheat in the Indus delta, Sindh





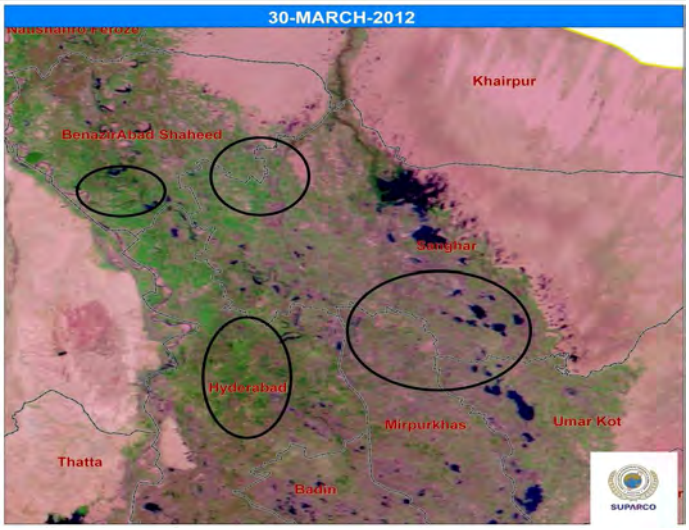
Temporal Change: Wheat in Southern Punjab

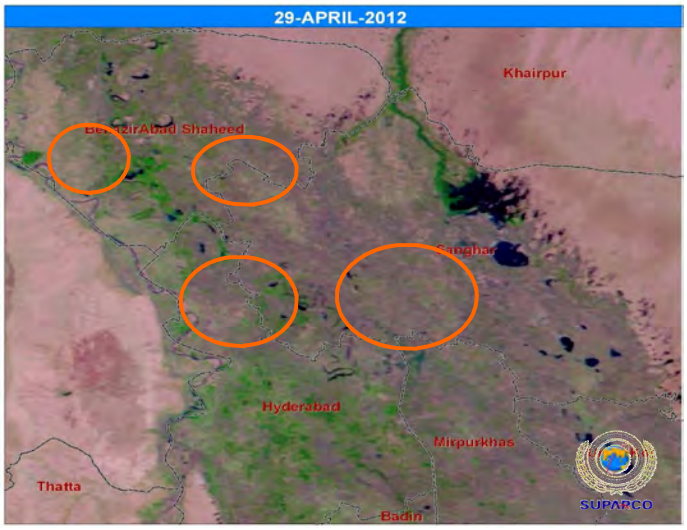




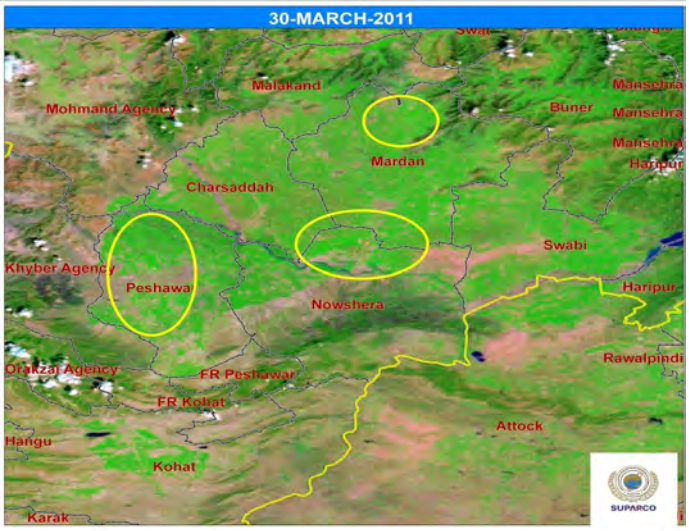
Sowing/Land preparation Active Growth Maturity Harvesting Satellite Imagery: MODIS 250m

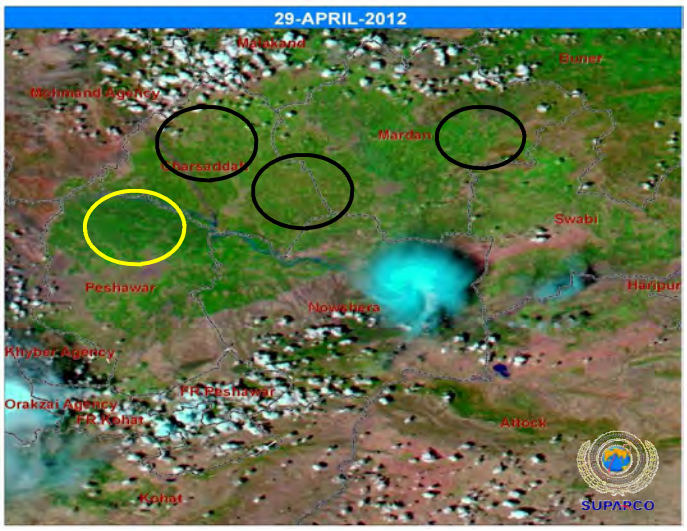
Temporal Change: Wheat in Sindh



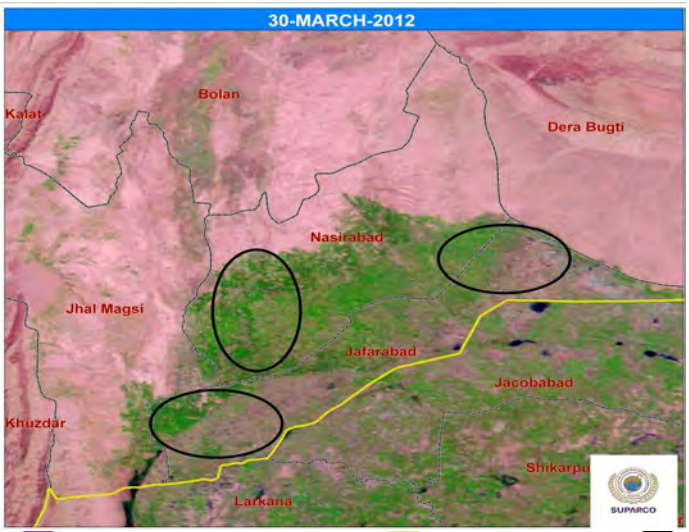


Temporal Change: Peshawar Valley, Khyber Pakhtunkhwa





Temporal Change: Pat Feeder Area of Balochistan





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

Agro-Met Conditions:

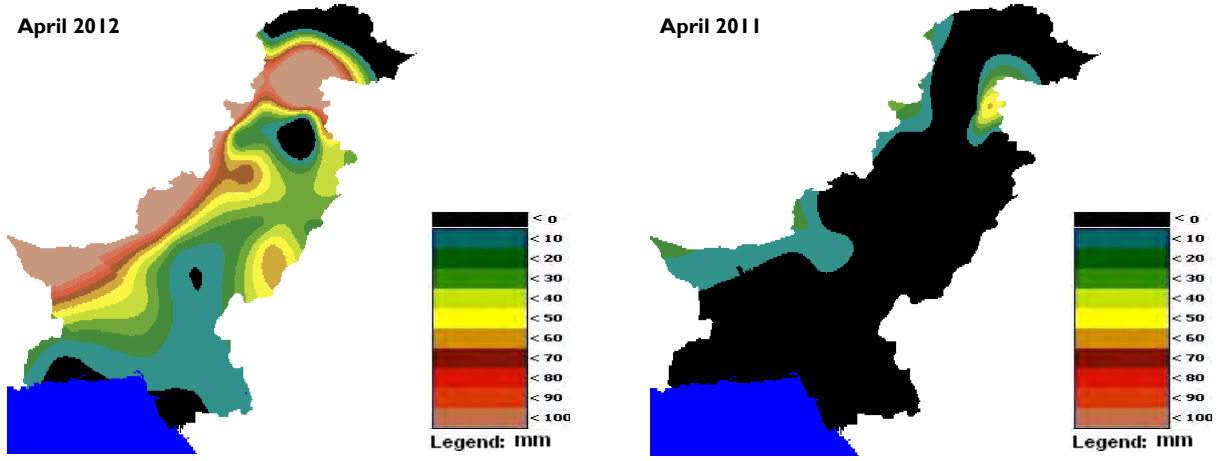
The agro met conditions in April were as follows:

a) **Rainfall:** Wide spread rains were recorded in the whole country during April however the intensity of rainfall was higher in GB and KP then Southern parts of the country. The rainfall at various stations is given below;

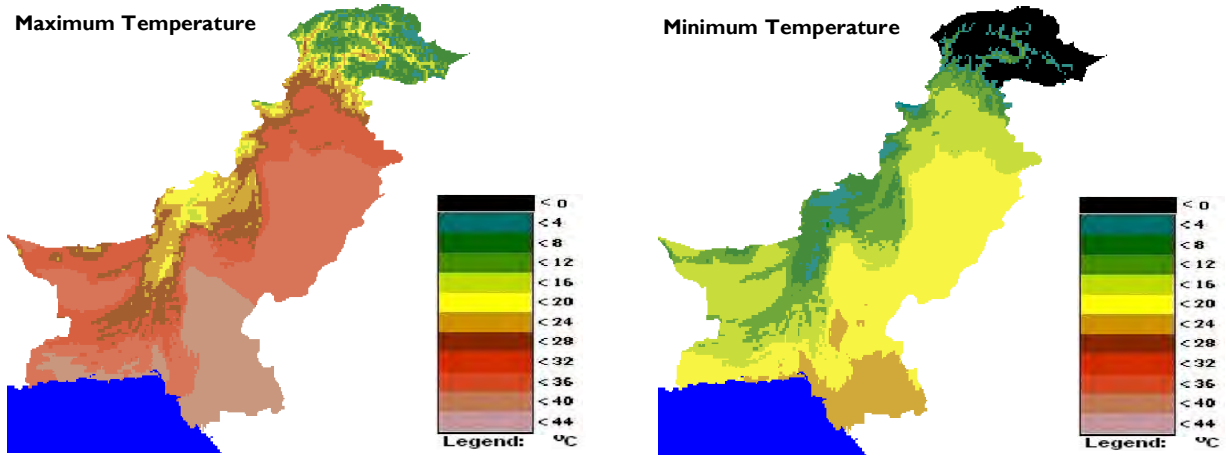
Month	Province	Rainfall
April 2012	**Punjab**	Bhawalnagar 22 mm, Bhawalpur 60 mm, Bhakkar 26 mm, Chakwal 44 mm, D G Khan 15 mm, Faisalabad 39 mm, Islamabad 36 mm, Jhang 9 mm, Joharabad 25 mm, Jhelum 18 mm, Lahore 50 mm, M B din 36 mm, Multan 23 mm, Mangla 37 mm, Muree 130 mm, Noor-pur Thal 69 mm, Okara 33 mm, R Y Khan 14 mm, Gujranwala 63 mm, Sargodha 21 mm, Sialkot 87 mm, T T Singh 31 mm
	Gigit Baltistan/ Azad Kashmir	Gari Dopatta 179 mm, Kotli 97 mm, Muzafarabad 144 mm, Rawalakot 128 mm, Pattan 84 mm,
	Khyber Pakhtunkhwa	Balakot 152 mm, Bannu 32 mm, Cherat 55 mm, Chitral 23 mm, D I Khan 77 mm, Kakul 208 mm, Dir 117 mm, Drosh 25 mm, Kalam 68 mm, Kohat 38 mm, Malam Jabba 208 mm, Mirkhani 34, Parachinar 359 mm, Peshawar 66.5 mm, Risalpur 73 mm, Saidu Sharif 98 mm,
	Sindh	Badin 23 mm, Hyderabad 10 mm, Larkana 6 mm, Padidan 14 mm, Rohri 5 mm, Dadu 41 mm,
	Balochistan	Barkhan 119 mm, Kalat 43 mm, Khuzdar 25 mm, Lasbela 29 mm, Quetta 85 mm, Samun-gli 104 mm, sibbi 23 mm, Zhob 38 mm,

b) Temperature: The average maximum temperatures during April 2012 were slightly lower than last two years after 7th April to the end of the month. The minimum temperature remained normal in at start of April 2012 but in last decade remained lower than the last year's April.

Monthly Cumulative Precipitation:



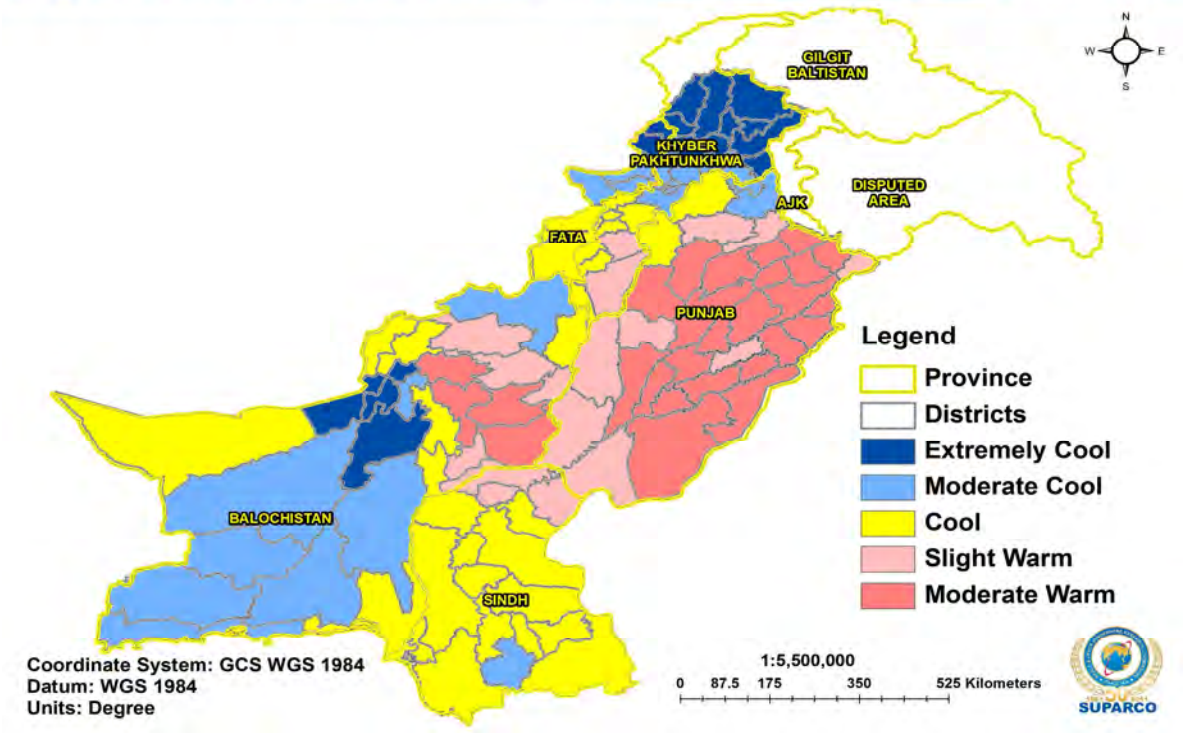
Monthly Temperature: April, 2012



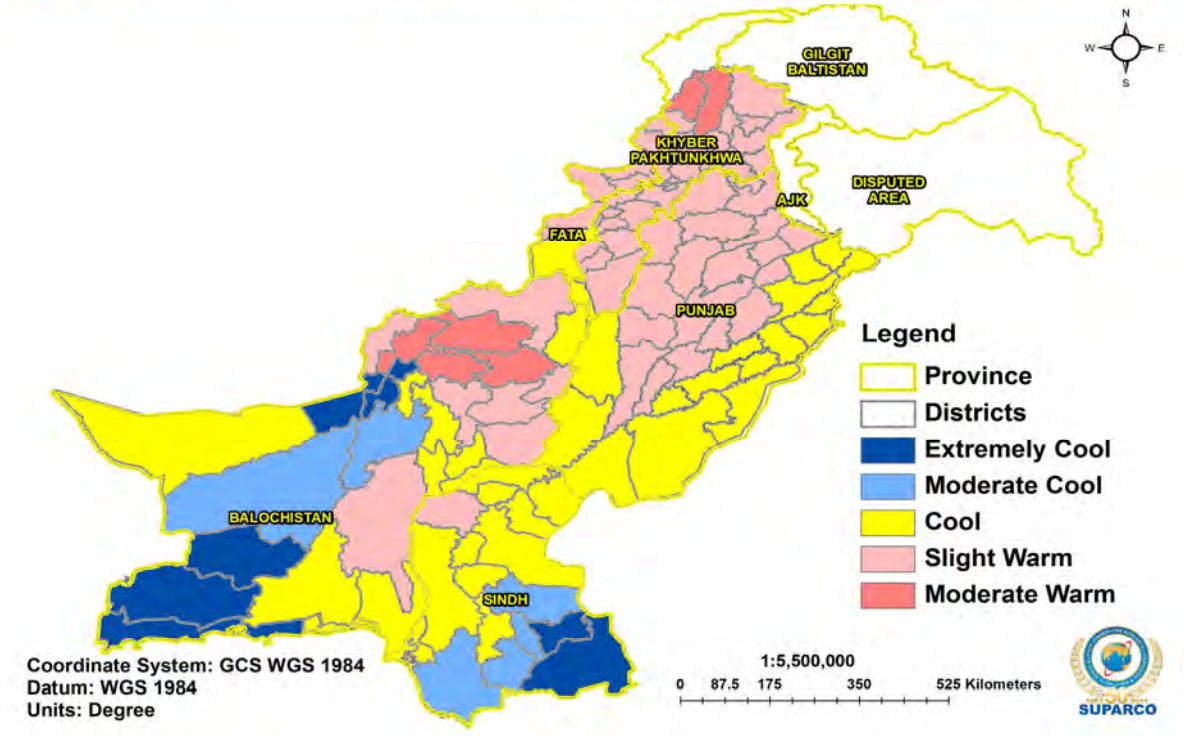
Impact assessment of Cool temperature regime on wheat crop 2011-12

A month wise study of temperature regimes for January, February, march and April 2012 has been carried viz. a .Viz. average of last two years. The maps showing these comparison are given below.

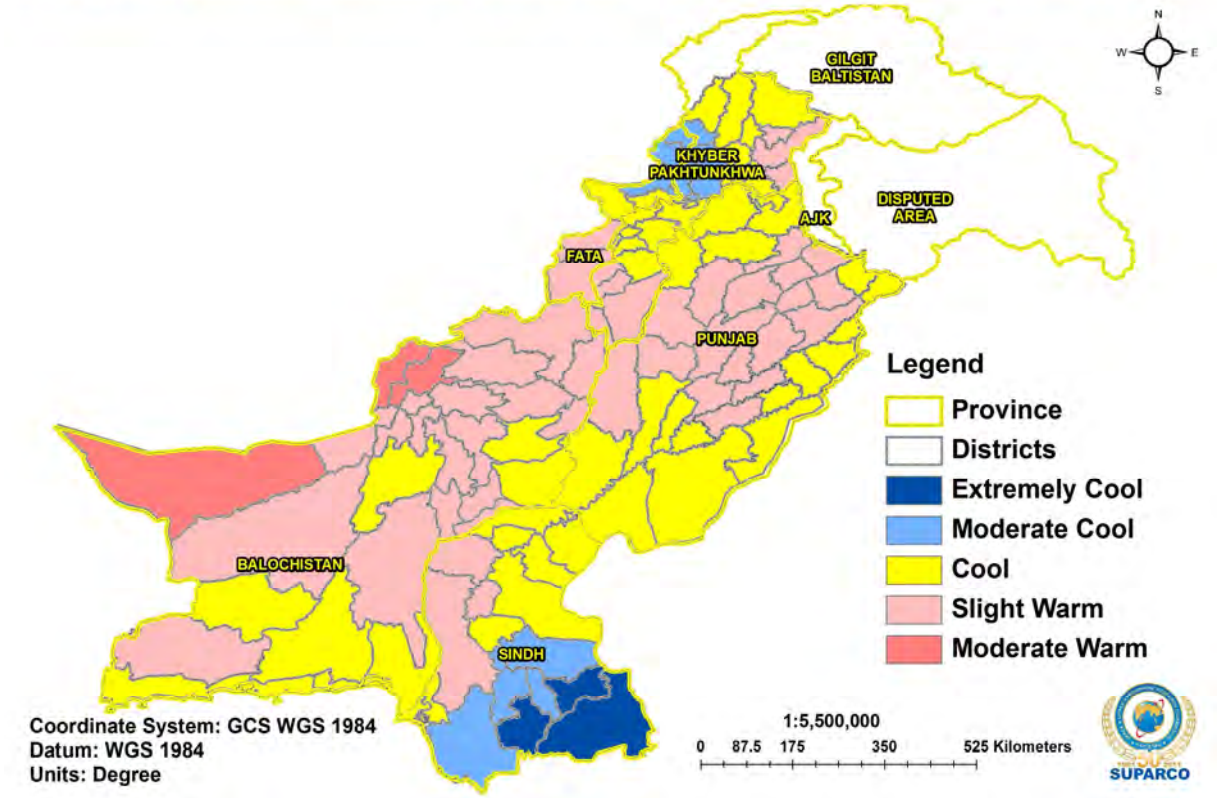
Comparative District-wise Maximum Temperature Profile for January 2012 and January Average of 2010 & 2011



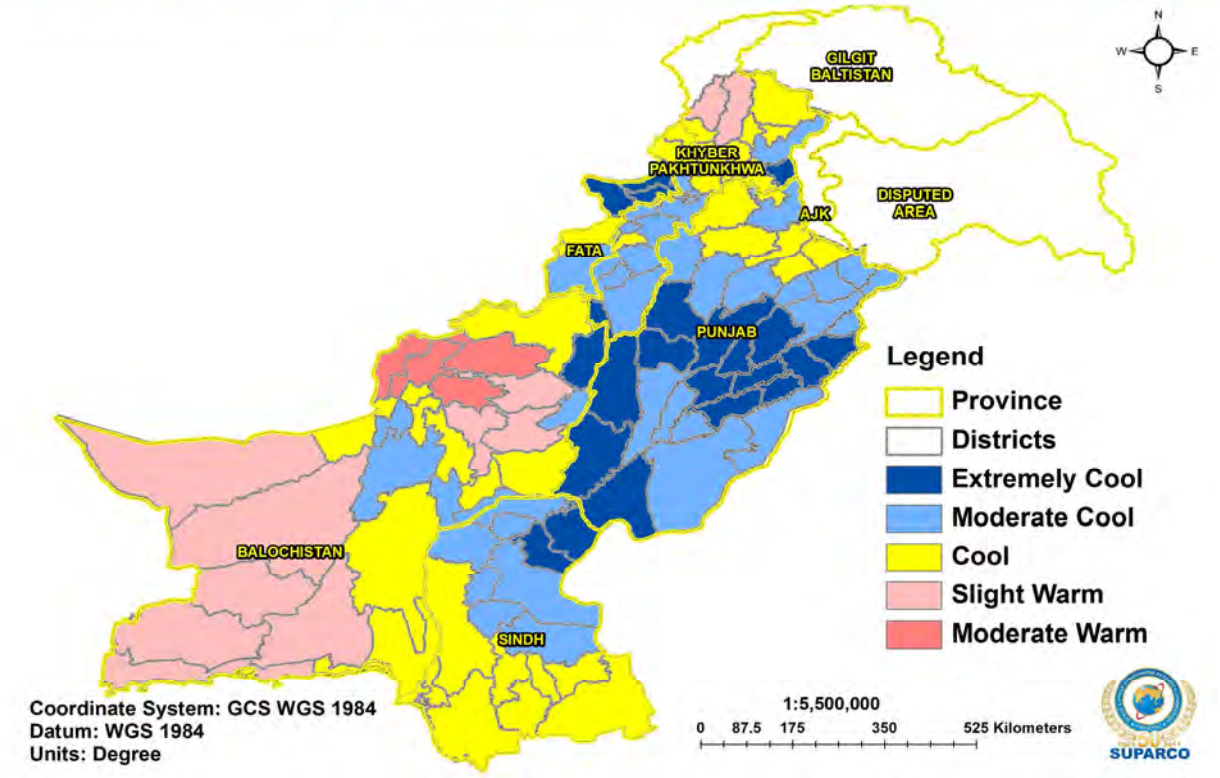
Comparative District-wise Maximum Temperature Profile for February 2012 and February Average of 2010 & 2011



Comparative District-wise Maximum Temperature Profile for March 2012 and March Average of 2010 & 2011



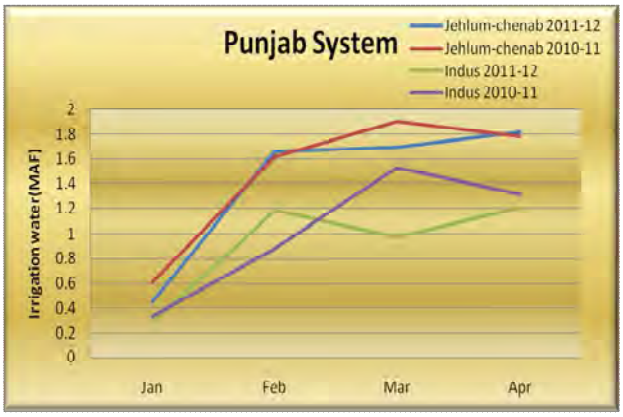
Comparative District-wise Maximum Temperature Profile for April 2012 and April Average of 2010 & 2011

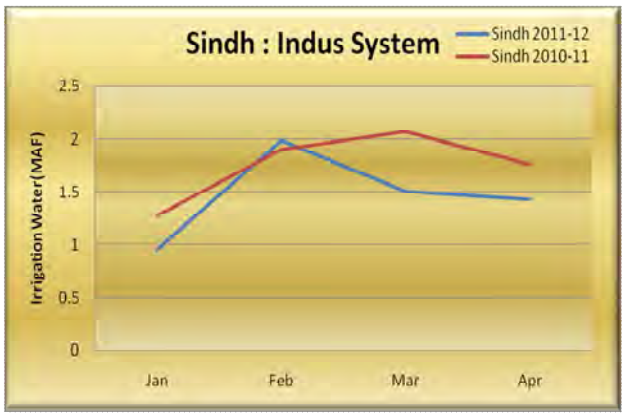


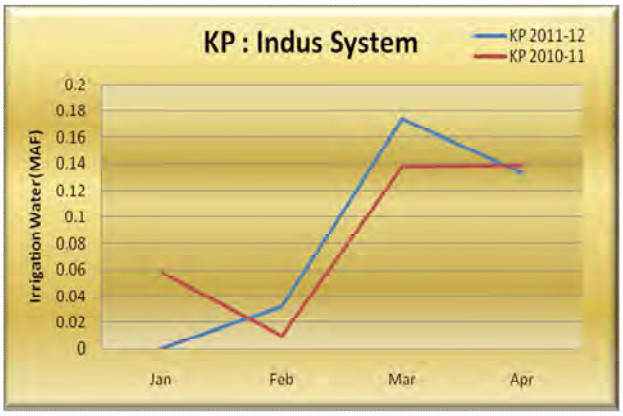
Irrigation Water Supply Situation :

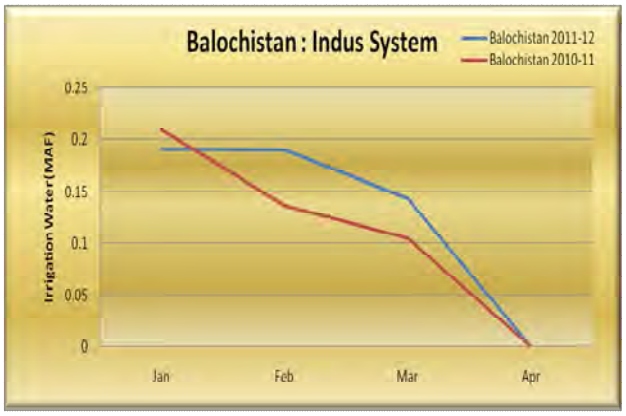
During current Rabi season, the total irrigation water supply from canal head works was 16 MAF compared to 17.746 million MAF last year. The supply was 9.263 MAF in Punjab, 5.875 MAF in Sindh, 0.339 MAF in KP and 0.524 MAF in Balochistan. This was short from last year by 6.9 percent in Punjab, 16 percent in Sindh and 1.4 percent in KP. The supply was higher by 16.2 percent in Balochistan.

	Month	Year	Punjab			Sindh	KP	Balochistan	Total
			Jhelum-Chenab	Indus	Total				
			Million Acre Feet						
2011-12	Jan	2012	0.450	0.283	0.733	0.954	0.000	0.191	1.878
		2011	0.604	0.330	0.933	1.274	0.058	0.209	2.474
		percent change	-25.44	-14.31	-21.50	-25.14	-100.00	-8.73	-24.12
	Feb	2012	1.659	1.181	2.840	1.988	0.032	0.190	5.050
		2011	1.616	0.876	2.491	1.902	0.010	0.137	4.540
		percent change	2.69	34.91	14.01	4.53	237.50	38.55	11.25
	Mar	2012	1.695	0.975	2.671	1.507	0.174	0.143	4.495
		2011	1.904	1.527	3.431	2.069	0.138	0.105	5.743
		percent change	-10.95	-36.12	-22.15	-27.19	25.97	36.93	-21.73
	Apr	2012	1.817	1.202	3.019	1.426	0.133	0.000	4.578
		2011	1.783	1.313	3.096	1.753	0.139	0.000	4.989
		percent change	1.89	-8.46	-2.50	-18.67	-4.29	0.00	-8.23
	Total	2012	5.621	3.641	9.263	5.875	0.339	0.524	16.001
		2011	5.906	4.046	9.952	6.999	0.344	0.451	17.746
		percent change	-4.82	-9.99	-6.92	-16.06	-1.44	16.24	-9.83









Daily Hydrological Status at Indus Basin: April, 2012

The water level in Tarbela at the end of April 2012 was 1389.04 feet above mean sea level (amsl) and Mangla was at 1089.50 feet (amsl).

Reservoir	Reservoir Level (feet) above mean sea Level on the date of								
	2-Apr		11-Apr		21-Apr		30-Apr		Full Capac-ity
	2012	2011	2012	2011	2012	2011	2012	2011	
Tarbela	1378.00	1389.43	1378.00	1378.00	1378.00	1392.94	1389.04	1398.78	1550.00
Mangla	1040.00	1096.25	1056.20	1084.35	1065.95	1112.10	1089.50	1123.00	1210.00

The inflows at RIM stations at Indus and other rivers are as follows:

April 2012: Daily River Water Inflow (000 cusecs)						
Day	Indus at Tarbela	Indus at Chashma	Indus at Taunsa	Jhelum at Mangla	Chenab at Marala	Kabul at Nowshera
2	27.4	26.2	26.8	33.3	15.6	22.5
3	28.3	37.4	25.7	30.9	18.6	27.0
4	31.0	41.7	26.8	46.5	21.7	32.2
5	33.4	45.7	26.2	41.1	18.6	34.0
6	33.4	51.6	29.0	42.4	18.6	32.8
7	31.5	52.8	36.8	39.1	21.7	33.9
9	33.2	52.2	47.4	31.8	20.5	29.8
10	33.7	48.7	47.4	37.6	18.8	31.2
11	37.2	53.6	47.4	43.8	21.9	33.9
12	35.8	52.9	47.4	47.5	36.6	34.7
13	35.3	60.3	46.6	48.9	22.4	34.0
14	32.1	52.8	44.2	42.2	23.9	34.2
16	29.3	47.3	47.5	36.0	17.8	28.2
17	26.5	42.4	47.5	33.1	20.9	28.5
18	26.0	35.2	52.0	31.9	17.8	29.0
19	27.1	41.8	52.8	32.3	14.0	31.4
20	28.1	40.3	58.0	33.4	15.6	33.7
21	32.1	47.2	47.4	34.9	15.6	36.1
23	42.8	79.0	44.6	52.8	24.9	52.9
24	37.1	82.7	46.9	48.4	24.9	48.1
25	36.5	71.3	52.7	42.7	21.7	44.7
26	35.5	64.3	47.5	44.6	21.7	40.5
27	37.2	68.0	51.6	44.0	25.3	40.7
28	39.0	63.8	55.4	44.8	22.1	47.7
30	40.8	70.6	63.0	48.5	22.6	36.9
Condition	No Flood	No Flood	No Flood	No Flood	No Flood	No Flood

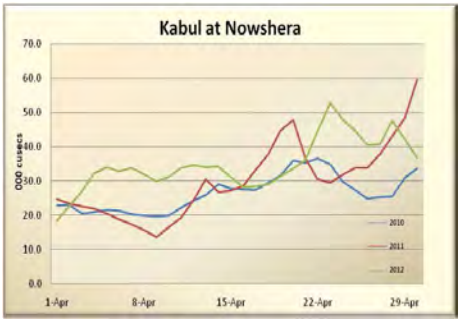












Source: Punjab Irrigation Department, Lahore

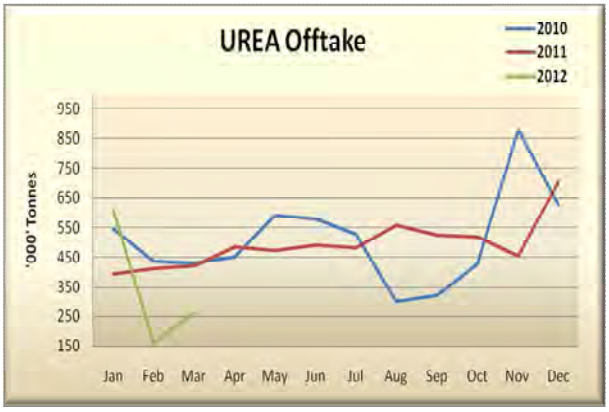
Fertilizer Situation:

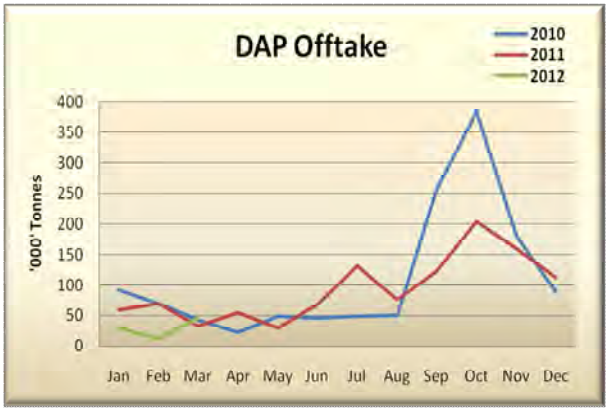
The total nutrient off take during Rabi 2011-12 (October 2011-March 2012) was about 1,776 thousand tones. This was lower by 19.8 per cent than last Rabi season. The nitrogen off take was 1446 thousand tones and it was lesser than last Rabi season by 16.3 percent. The phosphate off take was 320 thousand tons and it decreased by 31.6 per cent over last season. The urea off take was 2,771 thousand tons, lower than last Rabi by 14.2 percent. The DAP availability was 563 thousand tons, lower than last Rabi by 31.2 per cent.

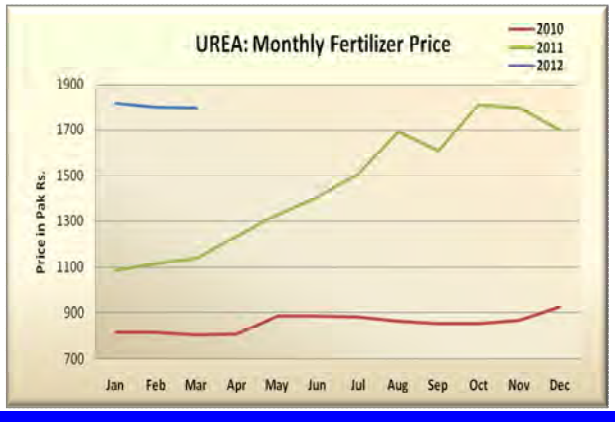
The gas load shedding in Pakistan Fertilizer Industry along with other sectors and high import prices of the commodity including depreciation in value of Pak currency are the main reasons for decrease in off take of urea and DAP fertilizers during the current Rabi season.

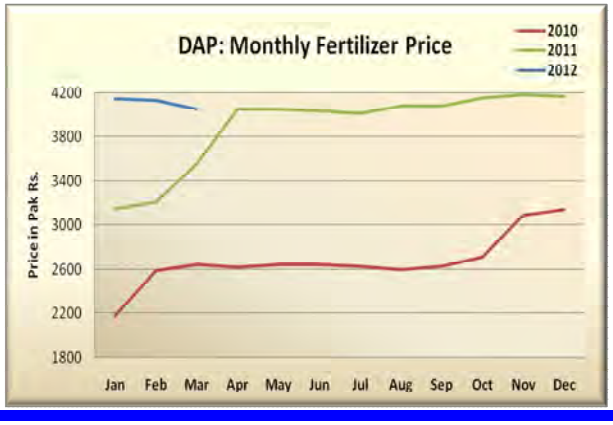
Season	Nutrient			Total	Product	
	Nitrogen	Phosphate	Potash	Nutrients	Urea	DAP
Rabi 2010-11(October– March)	1729	468	18	2215	3160	817
Rabi 2011-12 (October-March)	1446	320	9	1776	2711	563
Percentage Change	-16.3	-31.6	-48.3	-19.8	-14.2	-31.2

Month	2011-12				2010-11				percent Change			
	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total
	(000 tons)											
Oct	287.3	106.7	2.8	396.8	286.5	209.7	3.4	499.6	0.3	-49.1	-17.6	-20.6
Nov	258.9	84.7	1.5	345.1	464.7	101.6	2.9	569.2	-44.3	-16.6	-48.3	-39.4
Dec	377.3	66.6	2.1	446	333.5	59.4	3.3	396.2	13.1	12.1	-36.4	12.6
Jan	294	20.7	0.5	315.2	208.5	33.9	3.3	245.7	41.0	-38.9	-84.8	28.3
Feb	80.3	11.4	0.9	92.6	218.1	39.8	2.1	260	-63.2	-71.4	-57.1	-64.4
Mar	148.6	30.1	1.4	180.1	217	24.8	3	244.8	-31.5	21.4	-53.3	-26.4
Sub Total	1446.4	320.2	9.2	1775.8	1728.3	469.2	18	2215.5	-16.3	-31.8	-48.9	-19.8
Apr	223.5	23.9	1.5	248.9	252.7	33.1	2.8	288.6	-11.6	-27.8	-46.4	-13.8
Total	1669.9	344.1	10.7	2024.7	1981	502.3	20.8	2504.1	-15.7	-31.5	-48.6	-19.1



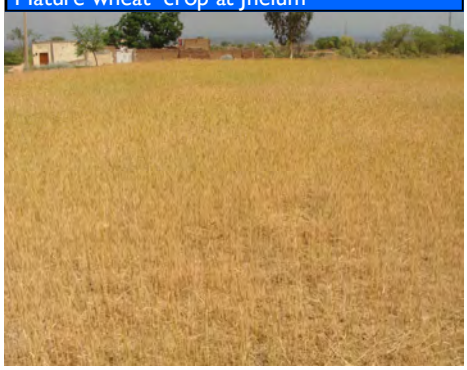






Field View of Crops in Punjab: April, 2012

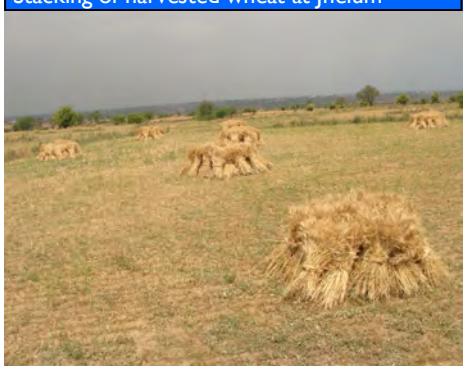
Mature wheat crop at Jhelum



Wheat thrashing at Jhelum



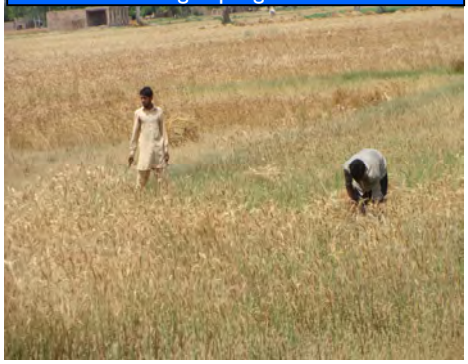
Stacking of harvested wheat at Jhelum



Mature wheat crop at Sialkot



Wheat harvesting in progress at Sialkot



Harvesting by combine at Sambrial, Sialkot



Cucumber at Pasruar, Sialkot



SUPARCO team with farmers Pasruar, Sialkot



SUPARCO team with farmers at Pasruar, Sialkot



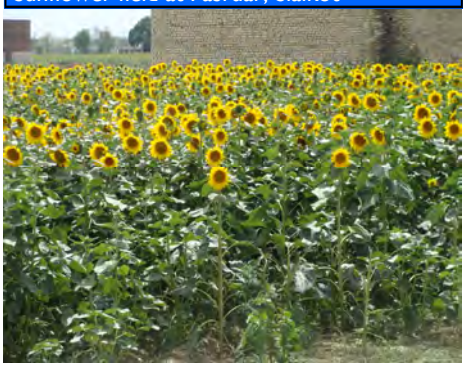
Tomato field at Pasruar, Sialkot



Sunflower field at Pasruar, Sialkot

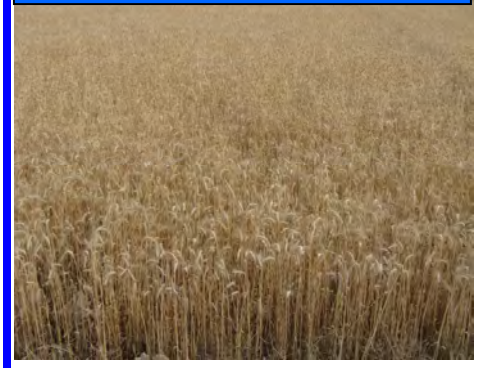


Sunflower field at Pasruar, Sialkot



Field View of Crops in Punjab: April, 2012

Mature Wheat at Narowal



Wheat harvest at Sohawa, Jhelum



Harvested wheat at Sargodha



Wheat harvested by combine at Lahore



Mature wheat crop at Sargodha



Wheat straw bins at Narowal



Barseem seed crop at Narowal



Vegetable at Sialkot



Vegetable field at Sialkot



Barseem at Sahiwal



Live stock farming, Chicha watni



Relaxing moments,



Field View of Crops in Punjab: April, 2012

Wheat at Haripur



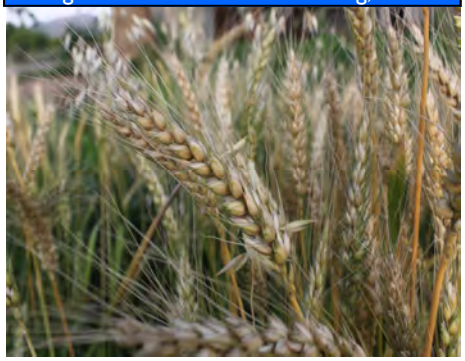
Wheat at Taxila



Wheat stacking at Kolian, Taxila



Bold grain ears at Mohra sardar Baig, Taxila



Rainfed wheat at Sukho,Taxila



Oats as fodder crop at Taxila



Flowering in Potato, Taxila



Cucumbers at Taxila



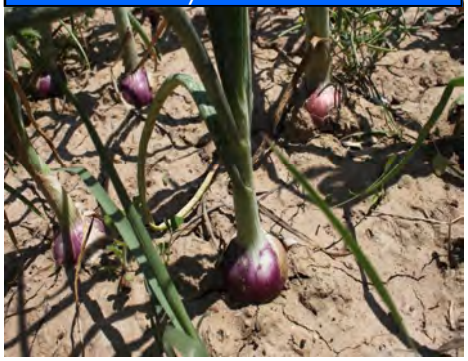
Onions at Taxila



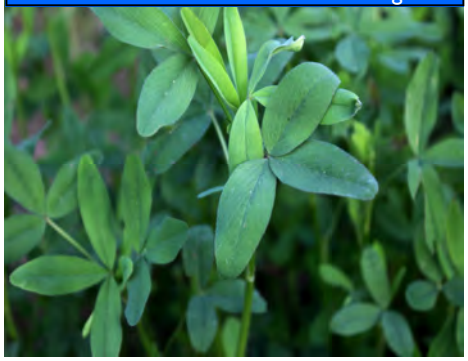
Onion seed crop at Taxila



Onions at maturity at Taxila



Trifoliate berseem at Mohra sardar baig



NEWS/UPCOMING EVENTS:

Wheat Crop Estimates 2011-12:

The satellite based wheat crop estimates by SUPARCO for the year 2011-12 on 1- April, 2012 are as follows.

Wheat Crop Estimate 2011-12			
Province	Area	Yield	Production
	000 ha	Kg/ha	000 tons
Punjab	6621.0	2770	18340.2
Sindh	1482.2	2519	3733.7
KP	757.9	1599	1211.9
Balochistan	349.0	2133	744.4
Pakistan	**9210.1**	**2609**	**24030.2**

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