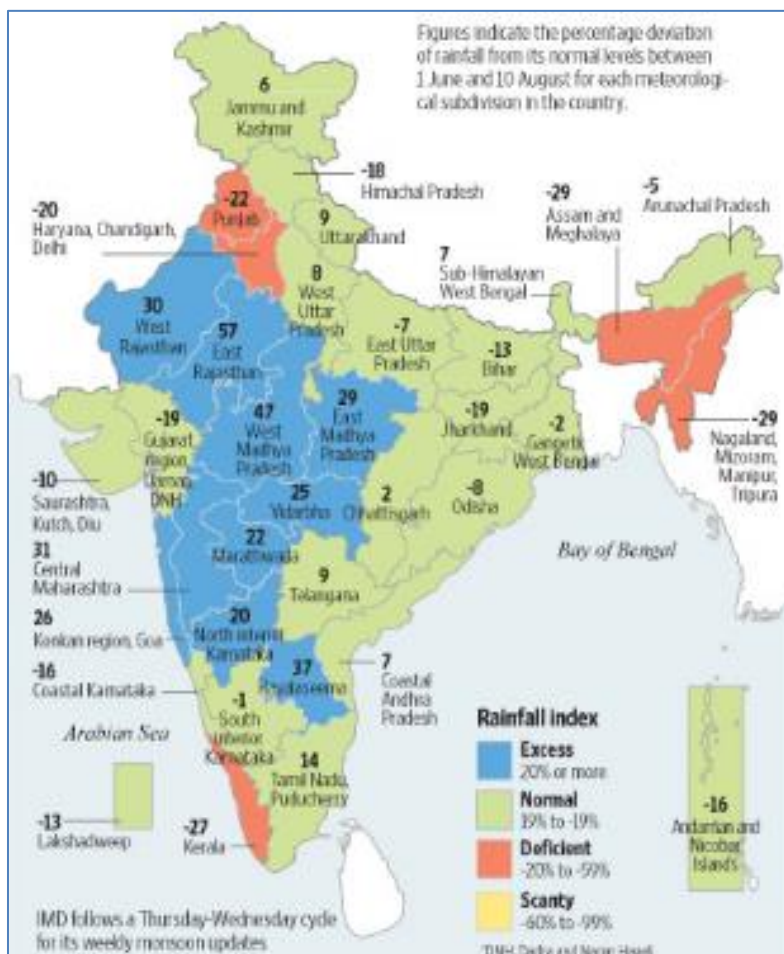


## Indian Monsoon Dynamics

### Recent Weather Development

- India has so far recorded 3% excess rainfall this monsoon, the India Meteorological Department (IMD). North-west and central India have received 10% and 15% more rain, respectively, as compared to the long-period average (LPA), while the southern peninsula has recorded a deficit of 2%. The shortfall is higher in eastern and north-eastern regions, at 16%. The monsoon has been normal over most of the country so far, barring Kerala, Punjab, Haryana, Delhi, and some of the north-eastern states. IMD data shows that 92% of the country has received normal to excess rainfall during the ongoing rainy season.
- For the past two months, the Gujarat, Saurashtra and Kutch regions have received scant rainfall. But heavy rainfall in the past two weeks has brought the deficit to zero.
- Rain occurred at most places over Himachal Pradesh, Uttarakhand, Punjab, Haryana, Chandigarh & Delhi, East Rajasthan, Bihar, Jharkhand, Chhattisgarh, Konkan & Goa, Coastal Karnataka and Kerala; at many places over Jammu & Kashmir, West Uttar Pradesh, Madhya Maharashtra, Odisha, Gangetic West Bengal, Arunachal Pradesh and Assam & Meghalaya; at a few places over East Uttar Pradesh, West Rajasthan, Gujarat, Vidarbha, Sub-Himalayan West Bengal & Sikkim, Andaman & Nicobar Islands, Lakshadweep and Nagaland, Manipur, Mizoram & Tripura and at isolated places over Marathwada, Telangana, Rayalaseema, Coastal Andhra Pradesh, Interior Karnataka and Tamil Nadu.
- Minimum temperatures are above normal (1.6°C to 3.0°C) at a few places over Tamil Nadu and at isolated places over Jammu & Kashmir, Himachal Pradesh, East Uttar Pradesh, Sub-Himalayan West Bengal & Sikkim, Vidarbha and Konkan & Goa. They are below normal .6 °C to -3.1°C at a few places over West Rajasthan and at isolated places over Madhya Pradesh and near normal over rest of the country.
- Maximum temperatures were appreciably above normal (3.1°C to 5.0°C) at most places over Coastal Andhra Pradesh; at many places over Telangana & Arunachal Pradesh; above normal (1.6°C to 3.0°C) at most places over Tamil Nadu, Kerala and Assam & Meghalaya; at many places over Rayalaseema and Vidarbha; at isolated places over East Uttar Pradesh, West Madhya Pradesh and Interior Karnataka. They were appreciably below normal .1



°C to -5.0°C) at most places over East Rajasthan; at many places over Himachal Pradesh, Haryana, Chandigarh & Delhi; below normal .6 °C to -3.1°C) at most places West Rajasthan; at a few places over Sub-Himalayan West Bengal & Sikkim and Bihar and at isolated places over Gangetic West Bengal & Gujarat region and near normal over rest of the country.

Seasonal Rainfall (in mm) from 1 June to 11 August, 2016

Region	Actual	Normal	% Departure from Long Period Average
East & Northeast India	773.3	913	-15%
Northwest India	411.2	373.3	10%
Central India	697.5	609.7	14%
South Peninsula	430.6	445.2	-3%
<b>All India</b>	<b>569.1</b>	<b>553.1</b>	<b>3%</b>

Source: IMD, Govt. of India

- The depression over Jharkhand & neighbourhood remained practically stationary in past 3 hours and lay centred at 0830 hours IST of today i.e. 12th August, 2016, over Jharkhand & neighbourhood, near Lat. 24.0°N and Long. 84.5°E, about 40 km east of Daltonganj (Jharkhand). The system is very likely to move west- northwestwards and weaken into a well-marked low pressure area during next 12 hours. The upper air cyclonic circulation over Haryana & adjoining north Rajasthan now lies over Haryana & adjoining north Rajasthan & West Uttar Pradesh and extends upto mid-tropospheric levels. The axis of monsoon trough at mean sea level passes through Ganganagar, Narnaul, Agra, Fursatganj, centre of depression, Digha and thence southeastwards to northeast Bay of Bengal and extends upto 1.5 Km above mean sea level. The feeble off-shore trough from south Gujarat coast to Karnataka coast, now runs from south Gujarat coast to south Maharashtra coast. The western disturbance as an upper air cyclonic circulation over north Pakistan & adjoining Jammu & Kashmir extending upto 2.1 km above mean sea level with a trough aloft, now seen as a trough in mid- tropospheric westerlies roughly along Longitude 73.0°E and north of Latitude 30.0°N. A low pressure area is likely to form over northwest Bay of Bengal around 16th August.
- The Central Water Commission monitors the live storage of 91 important/major reservoirs, having capacity at Full Reservoir Level (FRL) of 157.80 billion cubic meters (BCM), which is about 62% of total reservoir capacity in the country. Water stock in 91 major reservoirs increased to 71.56 BCM from the previous week's level of 59.35 BCM. Current storage is lower than the last year's position of 74.29 BCM and average of last 10 year's storage of 74.92 BCM. There were 49 reservoirs having storage more than 80%, 25 reservoirs having storage between 50% to 80% of Normal Storage, 11 reservoir having storage between 30% to 50%, 06 reservoir having storage upto 30% of Normal Storage and 02 reservoir having no live storage.
- Incidence of Pink bollworm on early sowing irrigated cotton crop has been reported in trace to low intensity in Sourashtra Region in Amreli, Rajkot, Junagarh and Bhavnagar districts of Gujarat covering area about 50000 to 60000 hectares.
- Incidence of white fly on cotton crop has been reported in trace to moderate intensity in general, where as in Fazilka district at Danger Kheda and Killian Wali, intensity near the kinnow orchards where it was reported in severity in few isolated fields. Severe infection of sooty mould was also reported in few scattered fields in Punjab. Cotton leaf curl virus was also reported at many locations in Fazilka district. Population of green jassids has also been reported trace to low level in isolated field.
- As per latest information available on sowing of Kharif crops, around 83% of the normal area under Kharif crops has been sown upto 05.08.2016. Total area sown under Kharif crops in the country as on 05.08.2016 has been reported to be 885.29 lakh hectares as compared to 841.65 lakh hectares last year. This year's area coverage so far is higher by 43.6 lakh ha than normal as on date. Area coverage under rice is higher by 5.8 lakh ha than the last year. Area coverage under maize is higher by 9.1 lakh ha than the last year. Area coverage under pulses is higher by 31.4 lakh ha than the last year and by 34.4 lakh ha than normal as on date. This is due to higher coverage in Tur, Urad and Moong. Area coverage under Kharif coarse cereals has been higher by 5.1 lakh ha as compared to last year. Area coverage under total Kharif Oilseeds is higher by 9.9 lakh ha than the last year and by 10.3 lakh ha than normal as on date. Area coverage under Cotton is lower by 9.2 lakh ha than the last year. The details of the area covered so far and that covered during this time last year are given in the following page.

## Kharif Sowing Progress (up to 05.08.2016)

All India Crop Situation - Kharif (2016-17) as on 05.08.2016							
(In lakh hectares)							
Crop Name	Normal Area for whole Kharif Season	Normal Area as on date	Area sown reported			Absolute Change over (+/-)	
			This Year 2016	% of Normal for whole season	Last Year 2015	Normal as on date	Last Year
Rice	392.67	270.97	281.95	71.8	276.10	11.0	5.8
Jowar	25.33	19.00	17.55	69.3	16.76	-1.5	0.8
Bajra	81.63	60.67	57.47	70.4	63.19	-3.2	-5.7
Maize	73.50	69.08	79.45	108.1	70.37	10.4	9.1
Total Coarse Cereals	199.70	158.63	163.77	82.0	158.66	5.1	5.1
Total Cereals	592.37	429.60	445.72	75.2	434.76	16.1	11.0
Tur	40.05	30.85	46.20	115.4	29.87	15.4	16.3
Urad	24.39	20.78	29.54	121.1	22.93	8.8	6.6
Moong	23.59	20.11	28.46	120.7	20.45	8.4	8.0
Kulthi	2.51	0.21	0.45	17.9	0.22	0.2	0.2
Others	17.06	14.71	16.46	96.5	16.26	1.8	0.2
Total Pulses	107.59	86.66	121.10	112.6	89.72	34.4	31.4
Total Foodgrains	699.96	516.26	566.82	81.0	524.48	50.6	42.3
Groundnut	43.77	33.42	40.92	93.5	31.29	7.5	9.6
Soyabean	106.36	107.37	111.83	105.1	110.71	4.5	1.1
Sunflower	2.61	1.30	1.34	51.3	0.62	0.0	0.7
Sesamum	18.24	11.63	11.54	63.3	13.00	-0.1	-1.5
Nigerseed	3.15	0.63	0.43	13.6	0.55	-0.2	-0.1
Castorseed	11.48	2.94	1.52	13.2	1.48	-1.4	0.0
Total Oilseeds	185.60	157.28	167.58	90.28	157.65	10.3	9.9
Cotton	120.34	110.41	96.48	80.2	105.68	-13.9	-9.2
Sugarcane	49.96	46.21	46.87	93.8	46.11	0.7	0.8
Jute & Mesta	8.57	8.12	7.55	88.1	7.73	-0.6	-0.2
All- Crops	1064.42	838.27	885.29	83.2	841.65	47.0	43.6

Source: Crops & TMOP Divisions, DAC

Note: Area figures are as per eye assessment of State Agriculture Departments.

## State wise Development in Rainfall Activity

S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Day:11-08-2016				Period:01-06-2016 To 11-08-2016			
		ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
<b>REGION : EAST AND NORTH EAST INDIA</b>									
1	ARUNACHAL PRADESH	3.3	12.8	-74%	S	1084.5	1151.6	-6%	N
2	ASSAM	2.0	14.2	-86%	S	775.7	1004.7	-23%	D
3	MEGHALAYA	3.5	28.4	-88%	S	1055.1	1922.4	-45%	D
4	NAGALAND	11.8	11.0	6%	N	526.8	877.3	-40%	D
5	MANIPUR	2.1	13.0	-84%	S	810.0	935.3	-13%	N
6	MIZORAM	1.5	12.5	-88%	S	882.9	1042.4	-15%	N
7	TRIPURA	4.1	12.0	-66%	S	634.2	999.3	-37%	D
8	SIKKIM	2.9	16.6	-83%	S	1067.5	1136.6	-6%	N
9	WEST BENGAL	44.4	12.7	250%	E	897.9	848.3	6%	N
10	JHARKHAND	30.2	9.2	228%	E	557.3	657.7	-15%	N
11	BIHAR	10.7	10.3	4%	N	537.4	613.0	-12%	N
<b>REGION : NORTH WEST INDIA</b>									
1	UTTAR PRADESH	10.0	10.1	-1%	N	476.0	485.5	-2%	N
2	UTTARAKHAND	13.6	15.6	-13%	N	833.2	764.4	9%	N
3	HARYANA	12.2	5.4	127%	E	222.6	272.8	-18%	N
4	CHANDIGARH (UT)	5.5	9.1	-40%	D	313.6	530.5	-41%	D
5	DELHI (UT)	10.9	8.2	33%	E	407.8	387.5	5%	N
6	PUNJAB	5.1	5.0	2%	N	239.0	305.2	-22%	D
7	HIMACHAL PRADESH	12.9	10.2	26%	E	430.4	520.9	-17%	N
8	JAMMU & KASHMIR	9.2	7.2	28%	E	364.1	341.2	7%	N
9	RAJASTHAN	12.0	5.2	131%	E	384.2	257.9	49%	E
<b>REGION : CENTRAL INDIA</b>									
1	ODISHA	11.8	10.3	15%	N	632.9	683.3	-7%	N
2	MADHYA PRADESH	5.1	9.0	-44%	D	776.2	567.4	37%	E
3	GUJARAT	6.9	8.2	-16%	N	365.2	435.0	-16%	N
4	DADAR & NAGAR HAVELI (UT)	34.2	22.2	54%	E	2214.8	1532.5	45%	E
5	DAMAN & DIU (UT)	11.8	16.8	-30%	D	1361.7	1168.8	17%	N
6	GOA	13.5	28.8	-53%	D	2429.3	2327.8	4%	N
7	MAHARASHTRA	5.1	9.3	-46%	D	831.9	658.5	26%	E
8	CHHATTISGARH	6.5	11.1	-41%	D	716.9	705.6	2%	N
<b>REGION : SOUTH PENINSULA</b>									
1	ANDAMAN & NICOBAR (UT)	0.1	15.2	-99%	S	818.6	985.0	-17%	N
2	ANDHRA PRADESH	0.8	3.8	-79%	S	304.4	264.9	15%	N
3	TELANGANA	0.2	6.8	-98%	S	487.9	452.3	8%	N
4	TAMIL NADU	0.8	2.5	-68%	S	156.6	138.2	13%	N
5	PONDICHERRY (UT)	2.8	4.5	-39%	D	68.9	159.4	-57%	D
6	KARNATAKA	2.1	7.0	-70%	S	532.7	553.1	-4%	N
7	KERALA	3.0	14.9	-80%	S	1123.3	1551.3	-28%	D
8	LAKSHADWEEP (UT)	0.4	6.5	-94%	S	602.5	695.9	-13%	N
<b>COUNTRY :</b>		<b>8.2</b>	<b>8.7</b>	<b>-6%</b>		<b>569.1</b>	<b>553.1</b>	<b>3%</b>	

Source: IMD, Govt. of India

For the country as a whole, cumulative rainfall during this year's from 1<sup>st</sup> June 2016 to 12<sup>th</sup> August 2016 has been 3 % above normal. The details are given in the table above.



**Major Updates & Forecast for the Coming Week and Ahead**

- The IMD has forecast normal rainfall over eastern India till 19 August and in north-west and central parts of the country till 14 August. Peninsular India will receive subdued rainfall till 24 August.
- Monsoon rains in India were 15 per cent above average in the week ended August 10. The weather office has retained its forecast for an above-average monsoon this year, boosting hopes of a rise in farm output and income after two years of drought. An average or normal monsoon means rainfall between 96 and 104 per cent of a 50-year average of 89 centimeters.
- Heavy to very heavy rain at a few places over north Chhattisgarh and East Madhya Pradesh; heavy at a few places with heavy to very heavy at isolated places over East Uttar Pradesh; heavy to very heavy rain very likely at isolated places over Jharkhand and heavy at isolated places over Himachal Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi, West Uttar Pradesh, East Rajasthan, northwest Madhya Pradesh, south Chhattisgarh and Bihar.
- Reason for this heavy rain is the low-pressure area that travelled from Gujarat up to North Rajasthan. Though this low-pressure area had weakened and persisted as a cyclonic circulation over North Rajasthan, yet it was instrumental for fairly widespread rains.
- Rain intensity is likely to decrease but still scattered light to moderate rains would continue over eastern parts of Rajasthan. Weather in West Rajasthan, particularly over Jaisalmer, Barmer and Nagaur, will go dry. Isolated rain may occur over the region, but mostly dry weather will continue to persist over West Rajasthan for the next 4-5 days.

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