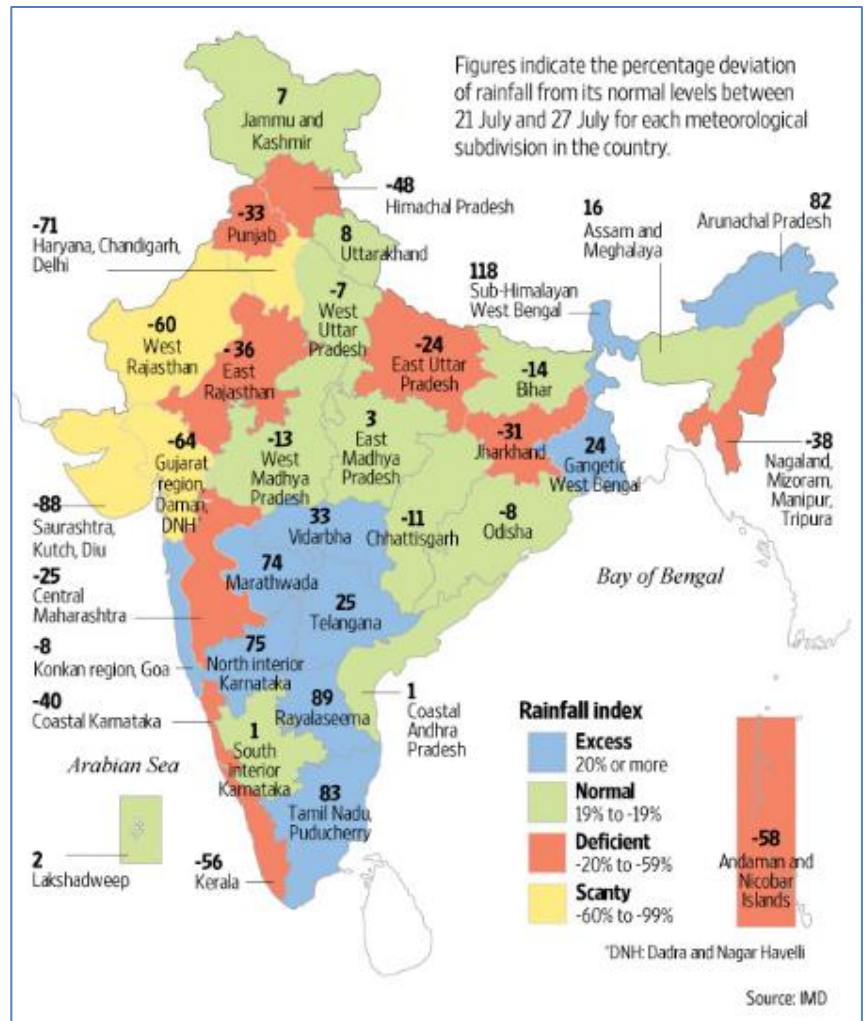


## Indian Monsoon Dynamics

### Recent Weather Development

- The monsoon has been normal so far, with countrywide rainfall being 1% above the long term average, as on Thursday. But this information alone doesn't provide the full picture. An analysis of IMD's district-wise data reveals scanty or deficient rain in 178 districts across the country, more than a quarter of all districts, while 171 have seen excess rainfall.
- The rest of the country has received normal rain (253 districts), with data on the remaining districts missing or not available.
- Nearly half-way into the four-month rainy season, the district rain map reveals information that sub-divisional or state-wise data does not show. For instance, statewide data shows a rain deficit of 16% for Jharkhand, which puts it in the "normal" category. But the situation in the state's districts is different. Half of Jharkhand's 24 districts have received deficient rain (which at the district level is defined as rainfall that's below 80% of normal).
- Likewise, Bihar has 13 districts with deficit rains, Odisha has 12, Haryana nine and Uttar Pradesh 13, in addition to four districts where rain has been scanty (less than 40% of normal). In fact, a swathe in eastern India, including north Chhattisgarh, Jharkhand, parts of Bihar and interior Odisha, are yet to receive good rains.
- This is apart from Gujarat, west Rajasthan, many parts of northeast, Kerala and Himachal Pradesh where the overall rainfall in the state puts them in the deficient category. Gujarat is the worst hit of all states, with a huge 57% deficit in Saurashtra and Kutch, and 43% in Gujarat region. Yadav said the state is likely to receive much-needed showers after around three days.
- Taking an all-India view, July has been a good month with an overall monsoon surplus of nearly 8% so far. That's almost exactly what the IMD had forecasted for the month (7%). The department has predicted a 4% surplus for August as well. It's hoped that in coming month, monsoon would be active in many of the areas left out so far.



- Rain occurred at most places over Uttarakhand, Haryana, Chandigarh & Delhi, West Uttar Pradesh, East Rajasthan, Gujarat region, Arunachal Pradesh, Nagaland, Manipur, Mizoram & Tripura, North Interior Karnataka, South Interior Karnataka,

Region	Actual	Normal	% Departure from Long Period Average
East & Northeast India	662.8	750.1	-12%
Northwest India	275.8	265.3	4%
Central India	493.6	456.7	8%
South Peninsula	369.3	358.0	3%
All India	429.2	425.2	1%

Source: IMD, Govt. of India

- Royalaseema, Kerala and Andaman & Nicobar Islands; at many places over East Uttar Pradesh, Jharkhand, Sub-Himalayan West Bengal & Sim, Saurashtra & Kutch, West Madhya Pradesh, Konkan & Goa, Madhya Pradesh, Coastal Karnataka, Telangana and Tamil Nadu; at a few places over Himachal Pradesh, West Rajasthan and Bihar; at isolated places over Jammu & Kashmir, Punjab, East Madhya Pradesh, Vidarbha, Chhattisgarh, Odisha, Gangetic West Bengal, Coastal Andhra Pradesh and Lakshadweep.
- Minimum temperatures are above normal (1.6°C to 3.0°C) at a few places over Gangetic West Bengal and at isolated places over Madhya Pradesh, Sub-Himalayan West Bengal & Sim and Coastal Andhra Pradesh. They are below normal (-1.6°C to -3.1°C) at many places over Konkan & Goa and Rayalaseema; at isolated places over West Rajasthan, East Uttar Pradesh, Saurashtra & Kutch and Tamilnadu and near normal over rest of country.
- On 28-07-2016, Maximum temperatures were appreciably above normal (3.1°C to 5.0°C) at isolated places over East Rajasthan, Madhya Maharashtra, Vidarbha, Chhattisgarh, Telangana, South Interior Karnataka, Kerala and Tamil Nadu; above normal (1.6°C to 3.0°C) at most places over Gangetic West Bengal; at a few places over Himachal Pradesh, East Madhya Pradesh, Madhya Maharashtra, Odisha, Jharkhand, Telangana, Coastal Karnataka, rest Kerala; at isolated places over Konkan & Goa, Bihar, South Interior Karnataka and Tamil Nadu. They are markedly below normal (-5.0°C or less) at isolated places over Haryana, Chandigarh & Delhi and West Rajasthan; appreciably below normal (-3.1°C to -5.0°C) at many places over rest Haryana, Delhi & Chandigarh; at a few places over East Rajasthan and West Rajasthan; at isolated places over West Uttar Pradesh, West Madhya Pradesh, North Interior Karnataka, Madhya Maharashtra and Tamil Nadu; below normal (-1.6°C to -3.1°C) at many places over J & K; at a few places over rest West Rajasthan and near normal over rest of country.
- Central Water Commission monitors 91 major reservoirs in the country which have total live capacity of 157.80 BCM at Full Reservoir Level (FRL). Current live storage in these reservoirs as on 21st July, 2016 was 54.42 BCM as against 59.10 BCM on 21.07.2015 (last year) and 52.05 BCM of Normal (average storage of the last 10 years) storage. Current year's storage is 92% of the last year's storage and 105% of the normal storage.
- Incidence of white fly & jassid on cotton crop has been reported in low to moderate intensity in Gumjal, Panniwalamals, Panjkosi & Killianwali villages under Khuian sarwar block of Fazilka district; Behlewal, Khara, Seda Sing Wala, Kothe Chand Singh, Kothe Narayangarh, Srawan, Lambwali and Kotsukhian villages of Faridkot district of Punjab. The crop stage is vegetative to square formation. Incidence of white fly on cotton crop has also been reported in moderate intensity in Hanumangarh district of Rajasthan. Incidence of Top borer on Sugarcane crop has been reported in moderate intensity in Haridwar district of Uttarakhand.
- As per latest information available on sowing of Kharif crops, around 65% of the normal area under Kharif crops has been sown upto 22.07.2016. Total area sown under Kharif crops in the country as on 22.07.2016 has been reported to be 692.98 lakh hectares as compared to 671.01 lakh hectares last year. This year's area coverage so far is higher by 22.0 lakh ha than normal as on date. Area coverage under rice is higher by 0.7 lakh ha than the last year. Area coverage under pulses is higher by 25.5 lakh ha than the last year and by 29.7 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 4.5 lakh ha as compared to last year. Area coverage under total Kharif Oilseeds is higher by 6.1 lakh ha than the last year and by 22.3 lakh ha than normal as on date. Area coverage under Cotton is lower by 12.7 lakh ha than the last year. As compared to last year, total area coverage this year is lower by 2.0 lakh ha under sugarcane.

## Kharif Sowing Progress (up to 15.07.2016)

All India Crop Situation - Kharif (2016-17) as on 22.07.2016							
(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	179.09	183.06	46.6	182.38	4.0	0.7
Jowar	25.33	15.61	14.59	57.6	13.52	-1.0	1.1
Bajra	81.63	45.26	43.36	53.1	45.68	-1.9	-2.2
Maize	73.50	59.73	68.26	92.9	62.61	8.5	5.7
Total Coarse Cereals	199.70	126.93	130.80	65.5	126.27	3.9	4.5
Total Cereals	592.37	306.02	313.86	53.0	308.65	7.8	5.2
Tur	40.05	21.92	35.90	89.8	23.44	14.0	12.6
Urad	24.39	15.03	21.76	89.2	16.64	6.7	5.1
Moong	23.59	14.07	23.10	97.9	16.06	9.0	7.0
Kulthi	2.51	0.10	0.21	8.4	0.16	0.1	0.1
Others	17.06	9.31	9.20	53.9	8.39	-0.1	0.8
Total Pulses	107.59	60.43	90.17	83.8	64.69	29.7	25.5
Total Foodgrains	699.96	366.45	404.03	57.7	373.34	37.6	30.7
Groundnut	43.77	24.12	34.00	77.7	27.12	9.9	6.9
Soyabean	106.36	93.84	106.06	99.7	104.81	12.2	1.3
Sunflower	2.61	0.82	1.19	45.6	0.53	0.4	0.7
Sesamum	18.24	6.70	7.07	38.8	9.24	0.4	-2.2
Nigerseed	3.15	0.29	0.28	8.9	0.32	0.0	0.0
Castorseed	11.48	1.13	0.57	5.0	1.01	-0.6	-0.4
Total Oilseeds	185.60	126.89	149.16	80.36	143.03	22.3	6.1
Cotton	120.34	95.80	86.86	72.2	99.52	-8.9	-12.7
Sugarcane	49.96	46.21	45.41	90.9	47.40	-0.8	-2.0
Jute & Mesta	8.57	8.03	7.52	87.7	7.71	-0.5	-0.2
All- Crops	1064.42	643.38	692.98	65.1	671.01	49.6	22.0

## State wise Development in Rainfall Activity

S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Day:28-07-2016				Period:01-06-2016 To 28-07-2016			
		ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
<b>REGION : EAST AND NORTH EAST INDIA</b>									
1	ARUNACHAL PRADESH	7.3	15.7	-53%	D	1017.0	997.6	2%	N
2	ASSAM	8.4	13.8	-39%	D	691.1	846.6	-18%	N
3	MEGHALAYA	5.6	31.8	-82%	S	987.7	1638.4	-40%	D
4	NAGALAND	3.7	11.5	-68%	S	452.9	707.8	-36%	D
5	MANIPUR	15.5	10.7	45%	E	739.0	763.5	-3%	N
6	MIZORAM	1.9	15.8	-88%	S	771.2	847.5	-9%	N
7	TRIPURA	13.3	14.8	-10%	N	551.6	838.3	-34%	D
8	SIKKIM	7.6	16.5	-54%	D	922.1	930.8	-1%	N
9	WEST BENGAL	1.2	13.6	-91%	S	706.2	678.6	4%	N
10	JHARKHAND	0.0	12.4	-99%	S	409.6	501.5	-18%	N
11	BIHAR	5.2	11.6	-55%	D	449.7	480.9	-6%	N
<b>REGION : NORTH WEST INDIA</b>									
1	UTTAR PRADESH	6.3	9.5	-33%	D	371.1	346.6	7%	N
2	UTTARAKHAND	13.0	14.8	-12%	N	638.1	551.6	16%	N
3	HARYANA	5.2	6.0	-14%	N	162.0	194.3	-17%	N
4	CHANDIGARH (UT)	0.0	8.6	-100%	NR	235.4	373.8	-37%	D
5	DELHI (UT)	18.8	8.0	135%	E	246.9	261.4	-6%	N
6	PUNJAB	5.7	5.7	1%	N	187.3	210.6	-11%	N
7	HIMACHAL PRADESH	10.1	11.1	-9%	N	270.2	370.5	-27%	D
8	JAMMU & KASHMIR	40.0	8.7	360%	E	245.9	234.1	5%	N
9	RAJASTHAN	13.0	4.5	189%	E	205.5	187.5	10%	N
<b>REGION : CENTRAL INDIA</b>									
1	ODISHA	2.0	14.9	-87%	S	426.0	519.1	-18%	N
2	MADHYA PRADESH	10.2	10.3	-1%	N	572.7	400.0	43%	E
3	GUJARAT	6.4	9.9	-36%	D	170.0	334.1	-49%	D
4	DADAR & NAGAR HAVELI (UT)	15.5	34.7	-55%	D	1085.8	1177.2	-8%	N
5	DAMAN & DIU (UT)	21.3	26.0	-18%	N	676.3	909.6	-26%	D
6	GOA	12.1	36.7	-67%	S	2118.7	1908.9	11%	N
7	MAHARASHTRA	12.0	11.1	8%	N	628.2	509.5	23%	E
8	CHHATTISGARH	3.8	13.8	-72%	S	508.9	521.8	-2%	N
<b>REGION : SOUTH PENINSULA</b>									
1	ANDAMAN & NICOBAR (UT)	24.1	15.9	52%	E	655.8	803.4	-18%	N
2	ANDHRA PRADESH	12.2	4.8	153%	E	267.6	207.9	29%	E
3	TELANGANA	8.4	7.9	6%	N	410.3	346.5	18%	N
4	TAMIL NADU	8.2	2.5	226%	E	139.8	108.3	29%	E
5	PONDICHERRY (UT)	0.0	9.4	-100%	NR	62.2	118.9	-48%	D
6	KARNATAKA	9.5	8.6	10%	N	444.0	446.3	-1%	N
7	KERALA	9.4	20.5	-54%	D	1016.1	1320.1	-23%	D
8	LAKSHADWEEP (UT)	23.2	3.9	495%	E	582.9	598.8	-3%	N
<b>COUNTRY :</b>		<b>10.5</b>	<b>9.9</b>	<b>6%</b>		<b>429.2</b>	<b>425.2</b>	<b>1%</b>	

Source: IMD, Govt. of India

For the country as a whole, cumulative rainfall during this year's from 1st June 2016 to 22<sup>nd</sup> July 2016 has been at par with normal. The details are given in the table above.

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

- After a slowdown in most parts of the country in the past week, the monsoon is expected to see a pickup in north-west and central India in the first week of August.
- In the initial part of August, central, north-west and peninsular regions will receive normal to above-normal rainfall. The east will receive below-normal rainfall, IMD said. So far, 80% of the country's area has received normal to excess rainfall and 20% has received deficient rains.
- Due to these weather features, rainfall activity is expected over Vidarbha, Marathwada as well as a few areas of Madhya Maharashtra. In fact, some areas over these sub-divisions could also witness heavy rainfall.
- The National Weather Service's Climate Prediction Center now says the odds are that precipitation will be above-normal for the desert Southwest and Four Corners region as the monsoon becomes stronger in August. But that forecast sheds little light on what kind of moisture might be expected for the Grand Junction area and to the north.
- The IMD in its latest climate outlook says rainfall in July, August and September could be more than 100 per cent of the normal rainfall but not above normal (104 per cent to 110 per cent) of the normal. This is down from IMD's earlier predictions, which has in its stage forecast issued in June had forecast the average rainfall to be 106 per cent of the normal monsoon rainfall of 89 mm (with +/-4 per cent model error). The met department will issue its second stage forecast in a couple of days.
- According to the Ministry of Earth Sciences (MoES), August and September rainfall are still expected to be 'reasonably okay'. "It will help fill up reservoirs by September end," said M Rajeevan, secretary, MoES recently. The reservoir in drought hit Marathwada region have filled up to only 5 per cent from the low of 1 per cent they had hit in June.

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