

Voluntary Report – Voluntary - Public Distribution

Date: October 23, 2023

Report Number: IN2023-0075

Report Name: Erratic Southwest Monsoon Concludes

Country: India

Post: Mumbai

Report Category: Agricultural Situation, Cotton and Products, Grain and Feed, Oilseeds and Products, Climate Change/Global Warming/Food Security

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Report Highlights:

The 2023 southwest monsoon was the most erratic in recent years, with sharp contrasts between excessive rains in July and September and a dry spell in August, with India experiencing below-average rainfall during the El Nino year. Cumulatively, southwest monsoon rainfall was 94 percent of its long period average (LPA). However, the rainfall over the monsoon core zone, which consists of most of the rainfed agriculture regions in the country received 101 percent of LPA- a normal amount. Country wide kharif planting area was similar to last year, but crops are at a higher risk of yield loss due to erratic rainfall distribution and lower reservoir storage levels as compared to last year. On September 30, India's Meteorological Department (IMD) published a normal forecast for the upcoming northeast monsoon from October to December, with rainfall at 88-112 percent of LPA.

DISCLAIMER: *The information contained in this report was retrieved from the Ministry of Earth Sciences/India's Meteorological Department (IMD) website <https://mausam.imd.gov.in/>. The U.S. Consulate General Mumbai – Foreign Agricultural Service (FAS) Office of Agricultural Affairs (OAA), USDA and/or the U.S. government make no claim of accuracy or authenticity. The Government of India has not officially endorsed this report. [Note: Use Google Chrome to access the links if they do not open in Internet Explorer]*

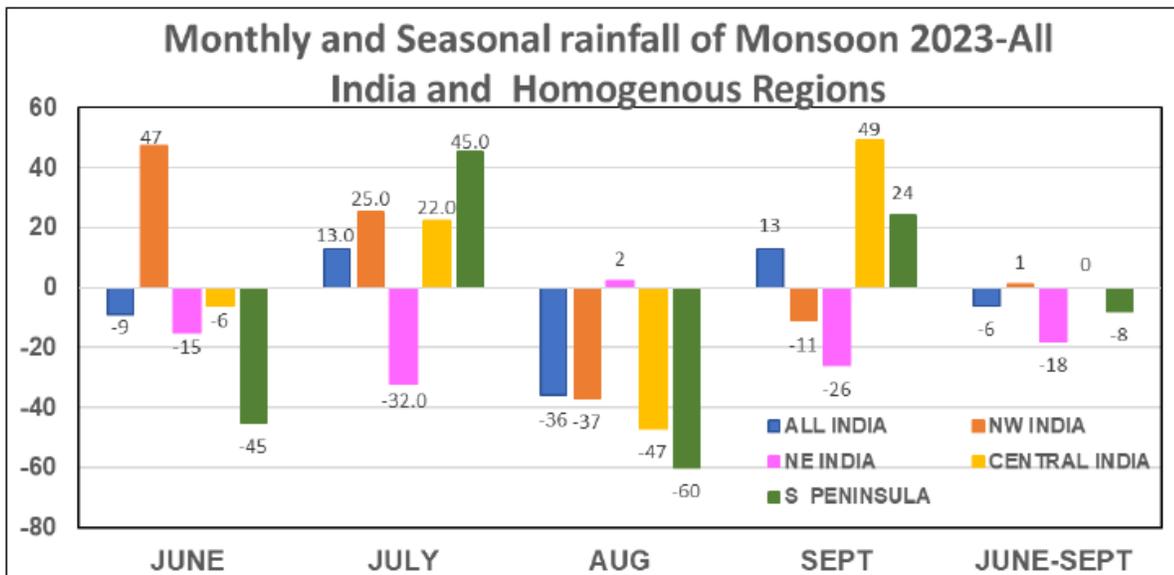
Southwest Monsoon 2023

According to India's Meteorological Department (IMD), rainfall over the country during the 2023 monsoon season (June-September), reached 94 percent of its LPA (a calculation of rainfall recorded over a particular region for a given interval average over a long period). LPA serves as a benchmark for forecasting quantitative rainfall for a region during a specific month or season. India's LPA of seasonal rainfall is 870 millimeters (mm), based on data from 1971-2020. Seasonal rainfalls over northwest India, central India, south peninsula, and northeast India were 101 percent, 100 percent, 92 percent, and 82 percent of respective LPA.

Monthly rainfall over the country was 91 percent of LPA in June, 113 percent of LPA in July, 64 percent of LPA in August, and 113 percent of LPA in September. According to the IMD, strong monsoon was observed from June 25- July 1, followed by a weak monsoon from August 5-17 and August 20 – September 2. However, the monsoon again became active after September 7. Overall, the month of August and first week of September received much less rainfall which led to a record monthly rainfall deficiency (-36 percent of LPA). Across India, almost 31 percent of districts received deficit rains, with most concentrated in the states of Uttar Pradesh, Bihar, Jharkhand, Karnataka, Kerala, and Assam.

For more details on the southwest monsoon, please refer to the [press release](#).

Figure 1. Monthly and Seasonal 2023 Monsoon Rainfall over Broad Homogenous Region and Country in Percentage Departure



Source: India Meteorological Department

Table 1. Southwest Monsoon Regional Rainfall Distribution from June 1 to September 30

Regions	2023 Actual (mm)	Normal (mm)*	2023 Percentage Departure from Normal
Northwest India	593.0	587.6	1%
Central India	981.7	978.0	0%
Southern Peninsula	659.0	716.2	-8%
East and Northeast India	1,115.0	1,367.3	-18%
All India	820.0	868.6	-6%

*Normal Rainfall is the fifty-year average from 1971-2020

Source: India Meteorological Department

Table 2. Kharif 2023 Crops Sowing Progress (in million hectares)

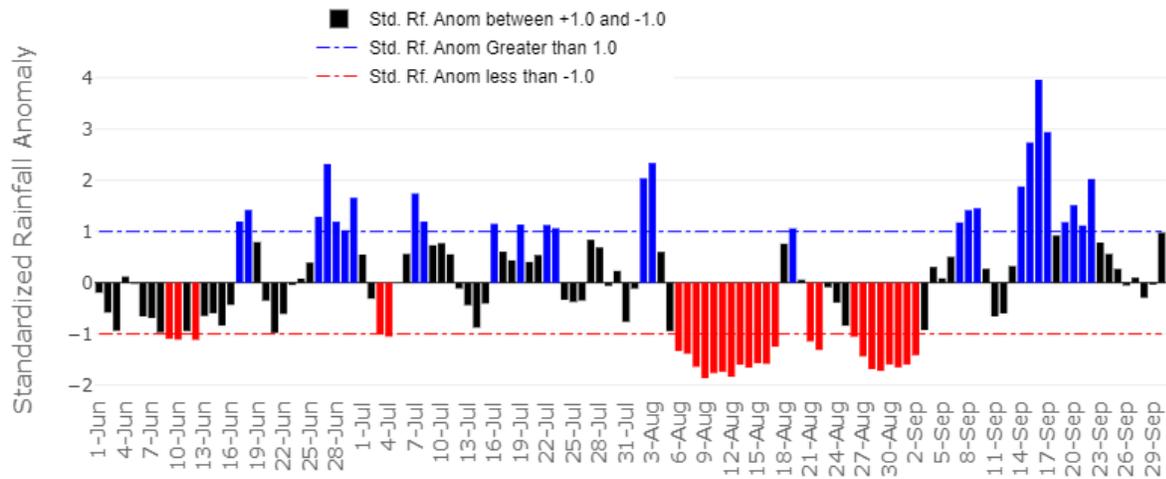
Crop	Area Sown as of September 29, 2023	Area Sown as of September 29, 2022	Normal Area	Y-o-Y Change	Change from Normal	Absolute Change
Rice	41.20	40.43	39.95	2%	3%	0.77
Pulses	12.36	12.90	13.97	-4%	-12%	-0.54
Coarse Cereals	18.80	18.48	18.19	2%	3%	0.32
Oilseeds	19.32	19.64	18.98	-2%	2%	-0.32
Sugarcane	5.99	5.57	4.89	8%	23%	0.43
Jute and Mesta	0.66	0.70	0.69	-6%	-4%	-0.04
Cotton	12.39	12.77	12.87	-3%	-4%	-0.39
Total	110.72	110.48	109.53	0%	1%	0.24

Source: Ministry of Agriculture and Farmers Welfare

Kharif 2023 Planting on Par Despite Erratic Monsoon

According to the [October 5 Sowing Report](#) published by the Ministry of Agriculture and Farmers Welfare (MOAFW), sowing levels across major kharif crops is similar to last year. Despite a week delay in monsoon onset, farmers increased area planted for rice, coarse cereals, and sugarcane. Farmers reduced area in pulses, oilseeds as delayed rains affected the optimum planting window, while cotton was reduced due to farmers considering more remunerative crops. Trade sources indicate that the erratic rainfall distribution is likely to increase the risk to crops in the field, and negatively impact yields.

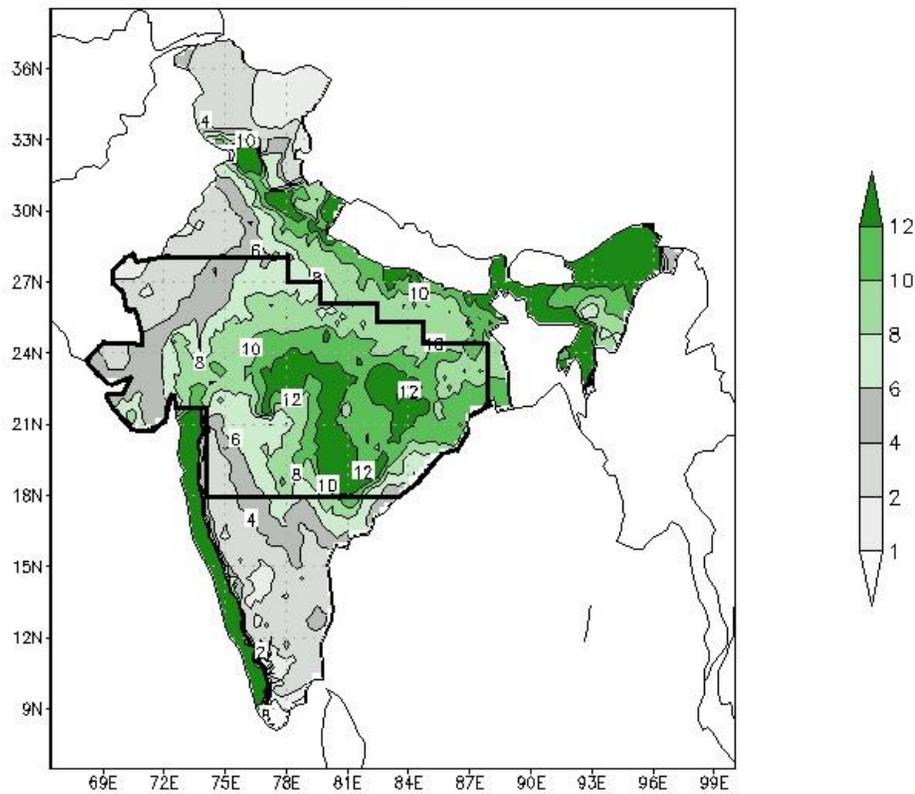
Figure 2. Standardize Rainfall Anomaly over the Core Monsoon Region 2023



Source: India Meteorological Department

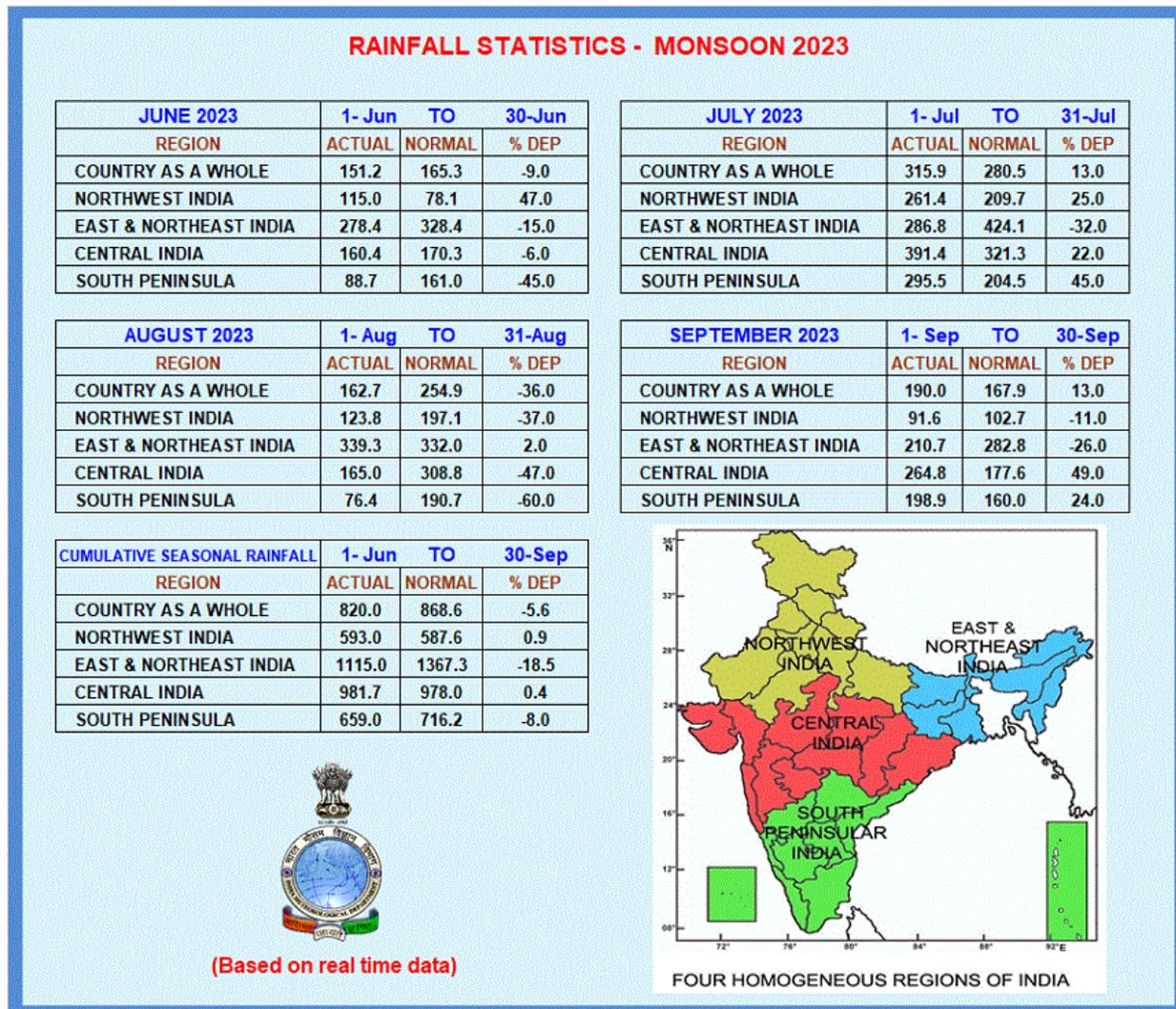
Figure 3. India. Monsoon Core Zone (MCZ)

RAINFALL CLIMATOLOGY (mm/day)
 JULY TO AUGUST



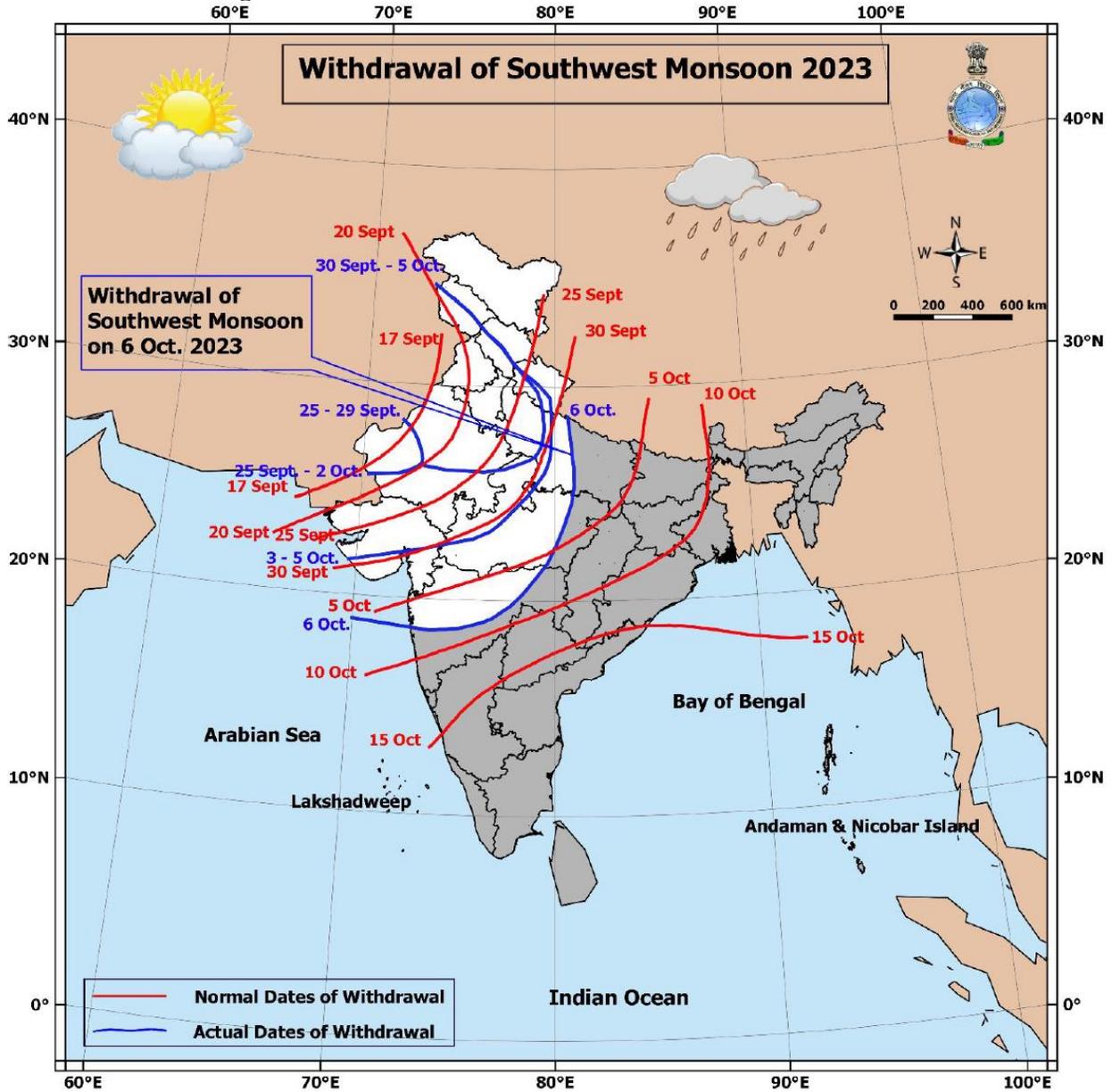
Source: India Meteorological Department

Figure 4. Rainfall Statistics for Southwest Monsoon 2023 (up to September 30)



Source: India Meteorological Department

Figure 5. India. Withdrawal of Southwest Monsoon 2023



Source: India Meteorological Department

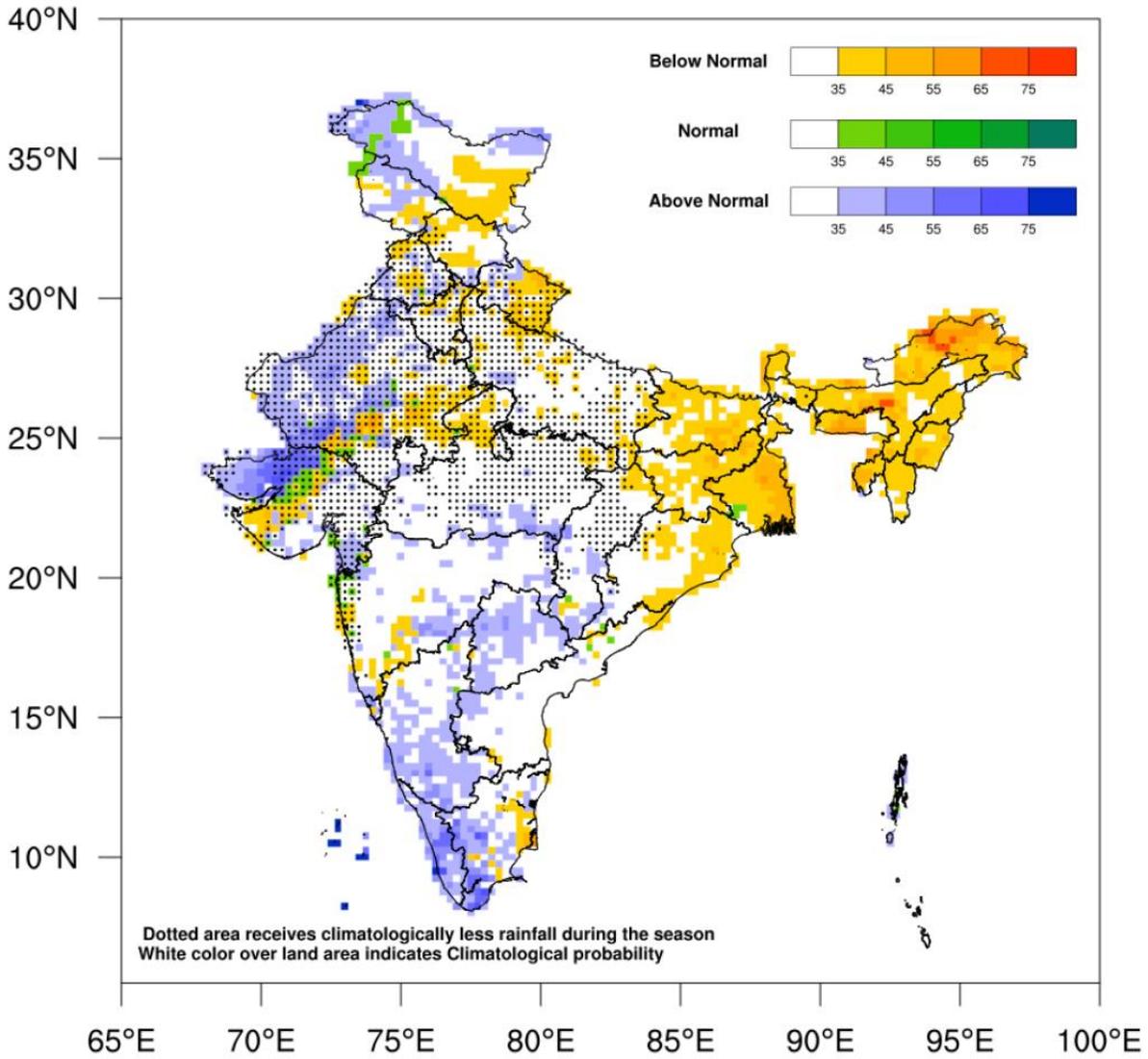
IMD Forecasts a Normal 2023 Northeast Monsoon

On September 30, IMD forecasted a normal 2023 Northeast monsoon (October-December) with rainfall at 88-112 percent of the LPA. The south peninsular India consists of five meteorological subdivisions (Tamil Nadu, Coastal Andhra Pradesh, Rayalaseema, Kerala and south interior Karnataka), which receives about 30 percent of its annual rainfall during the northeast monsoon season from October to December. Tamil Nadu receives about 48 percent of its annual rainfall during this season. For more details, please refer to this [press release](#).

Normal to above-normal rainfall is likely over many areas of northwest India and south peninsular India. However, northeast India, east central India, adjoining areas, and some areas of northwest India are likely to receive below normal levels. IMD has forecast October 2023 rains in southern peninsula between 85-115 percent of the LPA, and above-normal maximum and minimum temperatures likely over most parts of the country. For more details, please refer to the [press release](#).

Figure 6. Rainfall Forecast for 2023 Northeast Monsoon

probability rainfall forecast for 2023 October to December Season



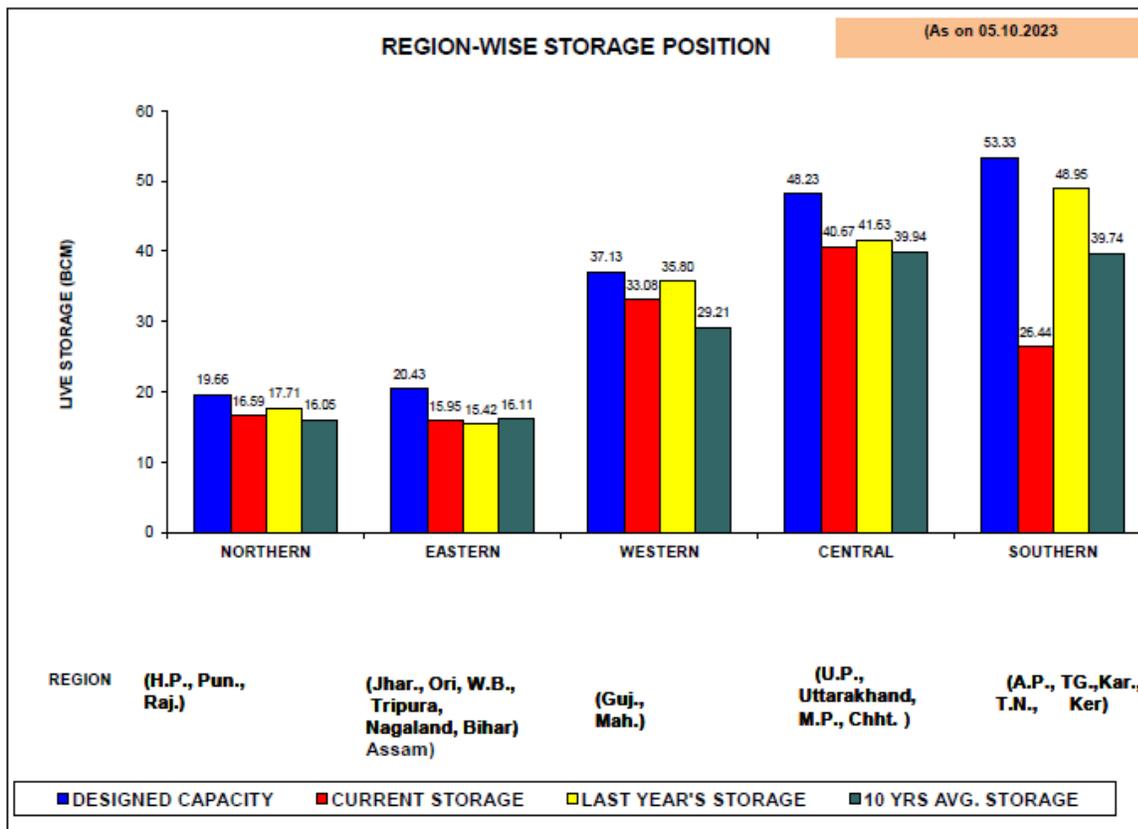
Source: India Meteorological Department

Low Reservoir Levels Remain a Concern

India's Central Water Commission monitors the storage status of 150 reservoirs around the country on a weekly basis. The latest [reservoir storage bulletin of October 5](#), shows current levels at 132.72 billion cubic meters (BCM) - 74 percent of total live storage capacity. The live storage level in these reservoirs for the corresponding period last year was 159.50 BCM (89 percent), and the 10-year average is 141.05 BCM (79 percent). As such, the current storage position is less than the same period last year, and less than the average storage level of the last ten years during the same period (Figure 2).

States with a higher percentage of reservoir levels as compared to last year are Assam, Jharkhand, Odisha, West Bengal, Bihar, Uttarakhand, and Telangana. Out of 150 reservoirs, 108 reported more than 80 percent of normal storage levels, and 42 reported 80 percent or below of normal storage. Out of these 42 reservoirs, 30 have storage between 51 percent and 80 percent of normal storage, and 12 have stored up to 50 percent of normal storage. According to the Central Water Commission, normal storage represents the average storage level of the last ten years. Close to normal storage represents a shortfall of up to 20 percent of normal. While deficient storage indicates that the shortfall is greater than 20 percent of the normal and up to 60 percent of the normal. Highly deficient means shortfall is more than 60 percent of normal.

Figure 7. Regional Reservoir Storage (billion cubic meters - BCM) – October 5



Source: Ministry of Jal Shakti/Central Water Commission

Figure 8. India Southwest Monsoon State Rainfall Map

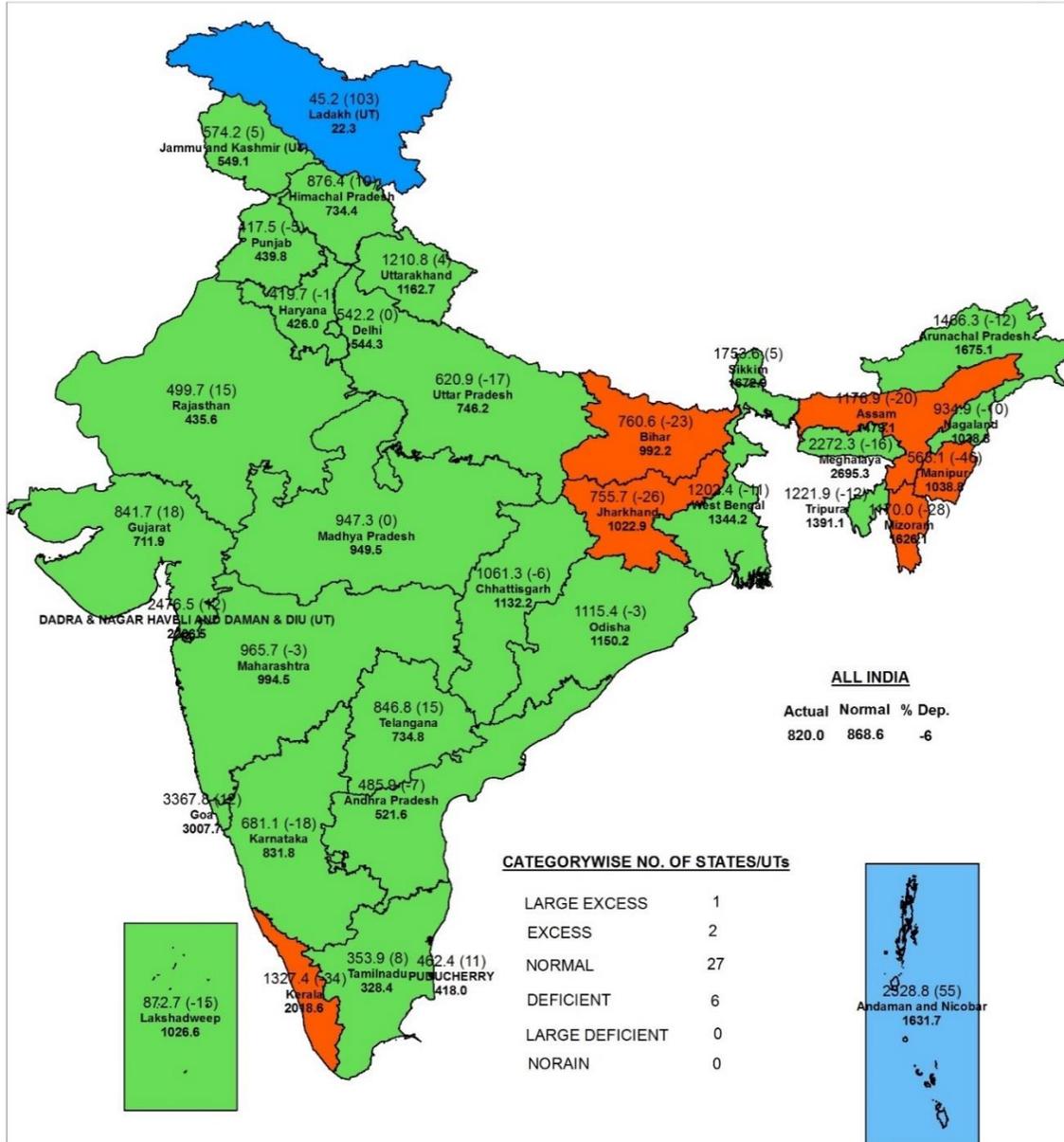


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INDIA METEOROLOGICAL DEPARTMENT

जल मौसम विज्ञान प्रभाग, नई दिल्ली
HYDROMET DIVISION, NEW DELHI

STATE RAINFALL MAP

Period : 01-06-2023 To 30-09-2023



Legend

Large Excess [60% or more] Excess [20% to 59%] Normal [-19% to 19%] Deficient [-59% to -20%] Large Deficient [-99% to -60%] No Rain [-100%] No Data

NOTES :

- a) Rainfall figures are based on operation data.
- b) Small figures indicate actual rainfall (mm), while bold figures indicate Normal rainfall (mm).
- c) Percentage Departures of rainfall are shown in brackets.

Figure 9. India Southwest Monsoon Subdivision Rainfall Map

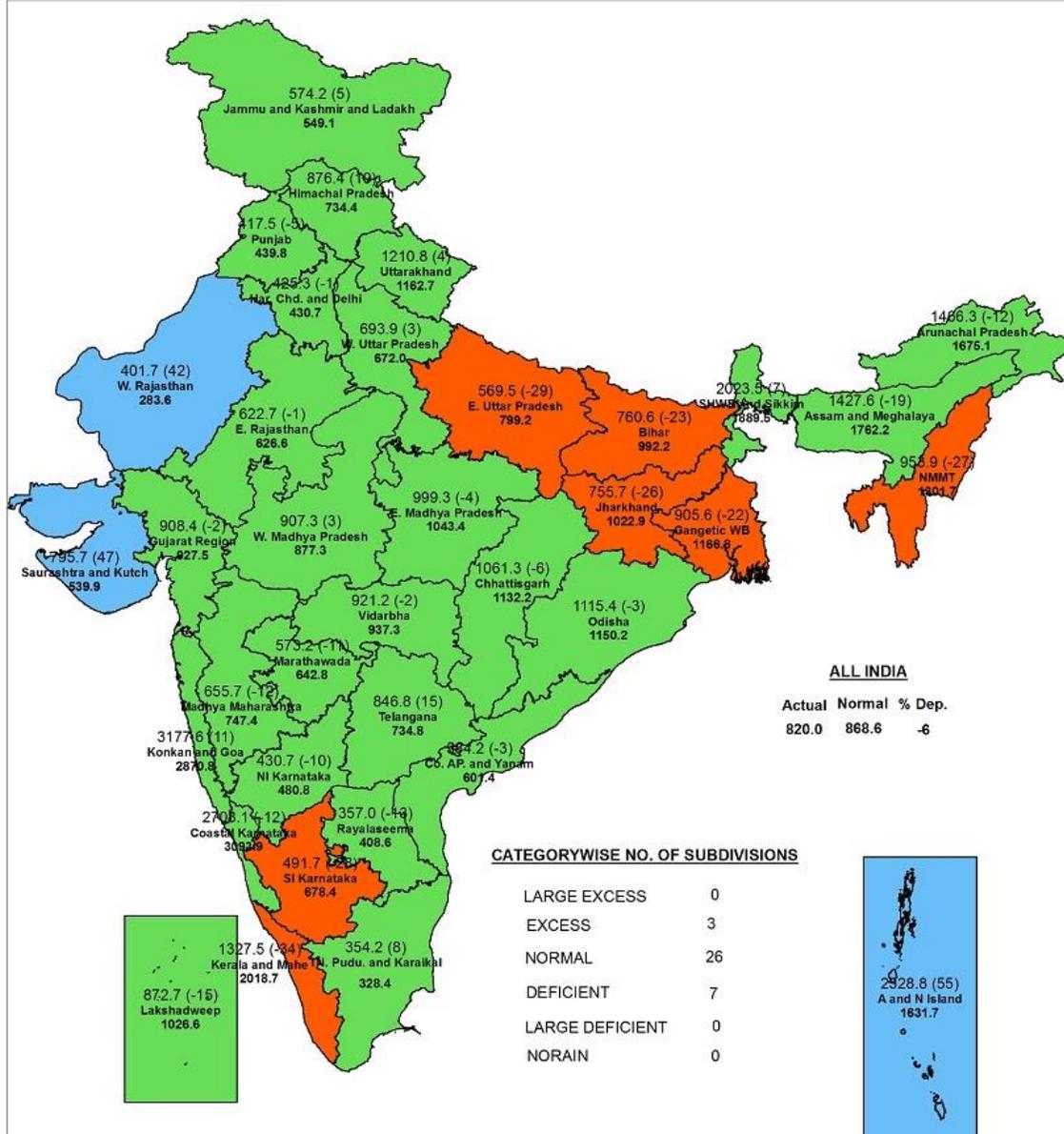


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INDIA METEOROLOGICAL DEPARTMENT

जन मौसम विज्ञान प्रभाग, नई दिल्ली
HYDROMET DIVISION, NEW DELHI

SUBDIVISION RAINFALL MAP

Period : 01-06-2023 To 30-09-2023



Legend

Large Excess [60% or more] Excess [20% to 59%] Normal [-19% to 19%] Deficient [-59% to -20%] Large Deficient [-99% to -60%] No Rain [-100%] No Data

NOTES :

- a) Rainfall figures are based on operation data.
- b) Small figures indicate actual rainfall (mm), while bold figures indicate Normal rainfall (mm).
- c) Percentage Departures of rainfall are shown in brackets.

Figure 10. India Southwest Monsoon District Rainfall Map

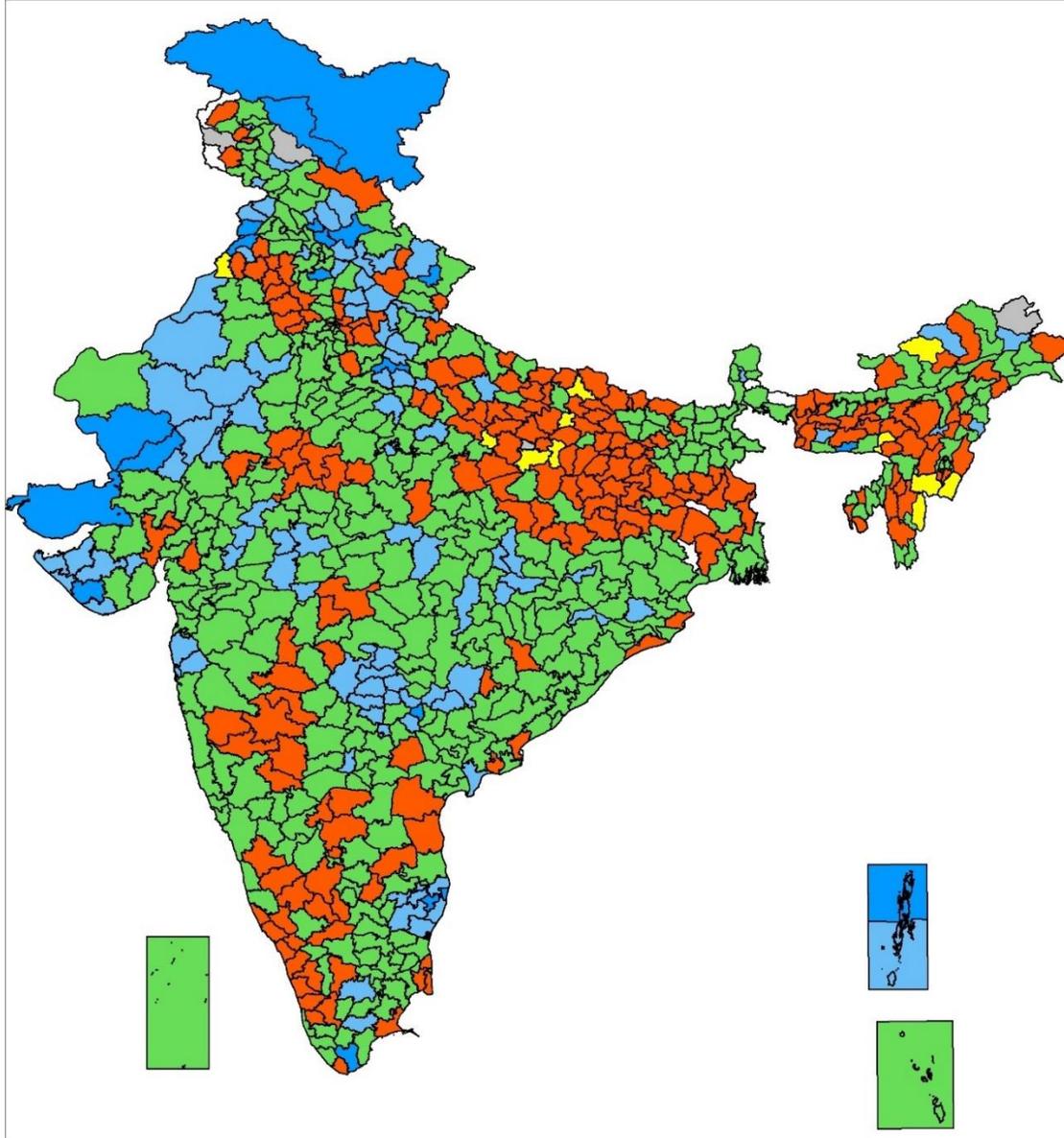


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INDIA METEOROLOGICAL DEPARTMENT

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HYDROMET DIVISION, NEW DELHI

DISTRICT RAINFALL MAP

Period : 01-06-2023 To 30-09-2023



Legend

Large Excess [60% or more] Excess [20% to 59%] Normal [-19% to 19%] Deficient [-59% to -20%] Large Deficient [-99% to -60%] No Rain [-100%] No Data

NOTES :

a) RainFall figures are based on operation data.

Figure 11. India Southwest Monsoon State-wise Rainfall Distribution



India Meteorological Department
Hydromet Division, New Delhi

STATE-WISE RAINFALL DISTRIBUTION

S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Day:29-06-2023				Period:01-06-2023 To 29-06-2023			
		ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
REGION : EAST AND NORTH EAST INDIA									
1	ARUNACHAL PRADESH	15.3	15.5	-1%	N	309.7	439.7	-30%	D
2	ASSAM	5.6	13.2	-58%	D	429.2	402.8	7%	N
3	MEGHALAYA	61.8	25.6	142%	LE	801.1	697.2	15%	N
4	NAGALAND	10.2	8.9	14%	N	219.0	252.2	-13%	N
5	MANIPUR	1.3	8.7	-85%	LD	175.0	286.9	-39%	D
6	MIZORAM	4.7	13.1	-64%	LD	285.1	411.5	-31%	D
7	TRIPURA	24.5	16.0	53%	E	322.1	412.7	-22%	D
8	SIKKIM	45.9	15.6	194%	LE	496.0	418.6	18%	N
9	WEST BENGAL	24.3	12.6	93%	LE	250.0	283.1	-12%	N
10	JHARKHAND	11.9	11.1	7%	N	96.5	181.4	-47%	D
11	BIHAR	10.3	10.7	-3%	N	47.5	151.1	-69%	LD
REGION : NORTH WEST INDIA									
1	UTTAR PRADESH	7.8	7.2	8%	N	62.6	89.2	-30%	D
2	UTTARAKHAND	8.0	9.2	-13%	N	134.0	168.2	-20%	D
3	HARYANA	6.6	2.6	155%	LE	72.8	50.0	46%	E
4	CHANDIGARH (UT)	0.0	8.5	-100%	NR	131.7	149.9	-12%	N
5	DELHI (UT)	17.8	4.3	315%	LE	126.0	60.4	109%	LE
6	PUNJAB	1.0	3.5	-70%	LD	64.2	49.7	29%	E
7	HIMACHAL PRADESH	3.1	5.4	-43%	D	118.8	95.4	25%	E
8	JAMMU & KASHMIR (UT)	2.0	4.7	-58%	D	80.5	71.4	13%	N
9	LADAKH (UT)	0.0	0.1	-100%	NR	4.5	2.8	60%	LE
10	RAJASTHAN	7.4	4.1	82%	LE	145.9	50.7	188%	LE
REGION : CENTRAL INDIA									
1	ODISHA	3.5	9.1	-61%	LD	161.1	201.4	-20%	D
2	MADHYA PRADESH	22.4	8.0	180%	LE	134.2	124.2	8%	N
3	GUJARAT	15.6	7.5	108%	LE	185.1	104.0	78%	LE
4	DADRA & NAGAR HAVELI AND DAMAN & DIU (UT)	80.7	20.0	304%	LE	390.9	338.3	16%	N
5	GOA	58.3	38.7	51%	E	560.9	871.8	-36%	D
6	MAHARASHTRA	15.9	10.4	52%	E	99.4	199.9	-50%	D
7	CHHATTISGARH	11.3	9.1	24%	E	159.7	178.4	-10%	N
REGION : SOUTH PENINSULA									
1	ANDAMAN & NICOBAR (UT)	9.9	10.9	-10%	N	481.3	403.9	19%	N
2	ANDHRA PRADESH	0.9	3.1	-72%	LD	63.5	91.2	-30%	D
3	TELANGANA	4.8	4.8	1%	N	64.4	126.0	-49%	D
4	TAMIL NADU	0.2	1.5	-86%	LD	51.5	49.3	4%	N
5	PUDUCHERRY (UT)	0.4	2.3	-81%	LD	98.6	67.4	46%	E
6	KARNATAKA	2.9	8.5	-66%	LD	88.0	192.9	-54%	D
7	KERALA	11.3	21.9	-49%	D	251.5	621.9	-60%	LD
8	LAKSHADWEEP (UT)	15.5	8.3	87%	LE	221.8	325.9	-32%	D
COUNTRY :		10.0	7.9	27%		136.5	157.7	-13%	

CATEGORYWISE DISTRIBUTION OF NO.OF STATES

CATEGORY	Day:29-06-2023	Period:01-06-2023 To 29-06-2023
	NO.OF STATES	NO.OF STATES
Large Excess	10	4
Excess	4	4
Normal	8	12
Deficient	4	14
Large Deficient	8	2
NoRain	2	0
NoData	0	0

Page - IV
Note: "The rainfall values are rounded off upto one place of decimal"

Figure 12. Southwest Monsoon State-wise Rainfall Distribution of Districts



India Meteorological Department
Hydromet Division, New Delhi

STATEWISE DISTRIBUTION OF DISTRICTS
WITH LARGE EXCESS, EXCESS, NORMAL, DEFICIENT, LARGE DEFICIENT AND NO RAINFALL

SN O	STATES	Period:01-06-2023 To 30-09-2023							
		LARGE EXCESS	EXCESS	NORMAL	DEFICIENT	LARGE DEFICIENT	NO RAIN	NO DATA	TOTAL
1	ANDAMAN & NICOBAR (UT)	1	1	1	0	0	0	0	3
2	ARUNACHAL PRADESH	0	2	7	5	1	0	1	16
3	ASSAM	0	0	13	14	0	0	0	27
4	MEGHALAYA	1	1	2	6	1	0	0	11
5	NAGALAND	0	2	5	4	0	0	0	11
6	MANIPUR	0	0	3	4	2	0	0	9
7	MIZORAM	0	0	3	4	1	0	0	8
8	TRIPURA	0	0	5	3	0	0	0	8
9	SIKKIM	0	1	3	0	0	0	0	4
10	WEST BENGAL	0	0	12	7	0	0	0	19
11	ODISHA	0	3	24	3	0	0	0	30
12	JHARKHAND	0	0	7	17	0	0	0	24
13	BIHAR	0	0	17	21	0	0	0	38
14	UTTAR PRADESH	1	12	22	34	5	0	1	75
15	UTTARAKHAND	1	5	4	3	0	0	0	13
16	HARYANA	1	1	14	6	0	0	0	22
17	CHANDIGARH (UT)	0	1	0	0	0	0	0	1
18	DELHI (UT)	0	1	6	2	0	0	0	9
19	PUNJAB	2	4	9	6	1	0	0	22
20	HIMACHAL PRADESH	3	4	4	1	0	0	0	12
21	JAMMU & KASHMIR (UT)	0	3	11	4	0	0	2	20
22	MADHYA PRADESH	0	11	35	6	0	0	0	52
23	GUJARAT	2	6	22	3	0	0	0	33
24	DADRA & NAGAR HAVELI AND DAMAN & DIU (UT)	0	1	2	0	0	0	0	3
25	GOA	0	0	2	0	0	0	0	2
26	MAHARASHTRA	0	4	23	9	0	0	0	36
27	CHHATTISGARH	0	6	16	5	0	0	0	27
28	ANDHRA PRADESH	0	1	18	7	0	0	0	26
29	TELANGANA	1	14	17	1	0	0	0	33
30	TAMIL NADU	3	8	21	6	0	0	0	38
31	PUDUCHERRY (UT)	0	1	2	1	0	0	0	4
32	KARNATAKA	0	0	19	12	0	0	0	31
33	KERALA	0	0	4	10	0	0	0	14
34	LAKSHADWEEP (UT)	0	0	1	0	0	0	0	1
35	LADAKH (UT)	2	0	0	0	0	0	0	2
36	RAJASTHAN	2	9	17	5	0	0	0	33
	TOTAL	20	102	371	209	11	0	4	717
CATEGORYWISE DISTRIBUTION OF DISTRICTS OUT OF 713 FOR WHICH DATA RECEIVED		3%	14%	52%	29%	2%	0%		

Attachments:

No Attachments.