

**INDIA METEOROLOGICAL DEPARTMENT
METEOROLOGICAL CENTRE, JAIPUR**



**RAJASTHAN
MONSOON REPORT-2022**

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MONSOON REPORT-2022

RAJASTHAN

HIGHLIGHT

- The rainfall during monsoon season (June-September, 2022) over the Rajasthan state as a whole was 137% of its long period average (LPA) based on data of 1971-2020. The rainfall received over the state was Excess (Departure +37% of long period average).
- Seasonal rainfall was 125% of its LPA over East Rajasthan and 158% of its LPA over West Rajasthan.
- Monthly rainfall received over the state was 100% of LPA in June, 167% of LPA in July, 139% of LPA in August and 85% of LPA in September.
- Southwest monsoon advanced over Kerala on 29th May, and over Rajasthan on 30th June (6 days behind the normal schedule of 24th June). Thereafter, monsoon covered the entire state by 2nd July against normal date of 8th July (about 6 days ahead of normal date).
- Out of total 33 districts, 04 districts received large excess rainfall (Departure +60% or more), 17 districts received excess rainfall (Departure +20% to +59%), 12 districts received normal rainfall (Departure -19% to +19%) and none of the districts received deficient rainfall (Departure -20% to -59%) during the season.

1. Onset and Advance of southwest Monsoon 2022

It was a good beginning for the season in terms of rainfall with formation and movement of an east-west trough in the lower tropospheric levels extending from Northwest India to Northeast India and north-south troughs/cyclonic circulations in the lower/mid tropospheric levels over the region in the last week of May and movement of an active Western Disturbances during 22-24 May across northwest and adjoining plains of India with induced low pressure area over northwest Rajasthan & neighborhoods on 23 May and persistence easterly wind pattern at lower levels across Indo-Gangetic plains at lower level in the region. Under the influence of both systems, for the 1st time in this summer of 2022, such significant wet spell occurred over these areas in this summer. It helped the monsoon to advance into main-land along the west coast. Subsequent features favored timely advance of monsoon. This year SW monsoon entered Rajasthan State from Udaipur, Jaipur and Kota divisions on 30th June and covered entire State and country by 2nd July against normal date of 8th July (about 6 days ahead of normal date).

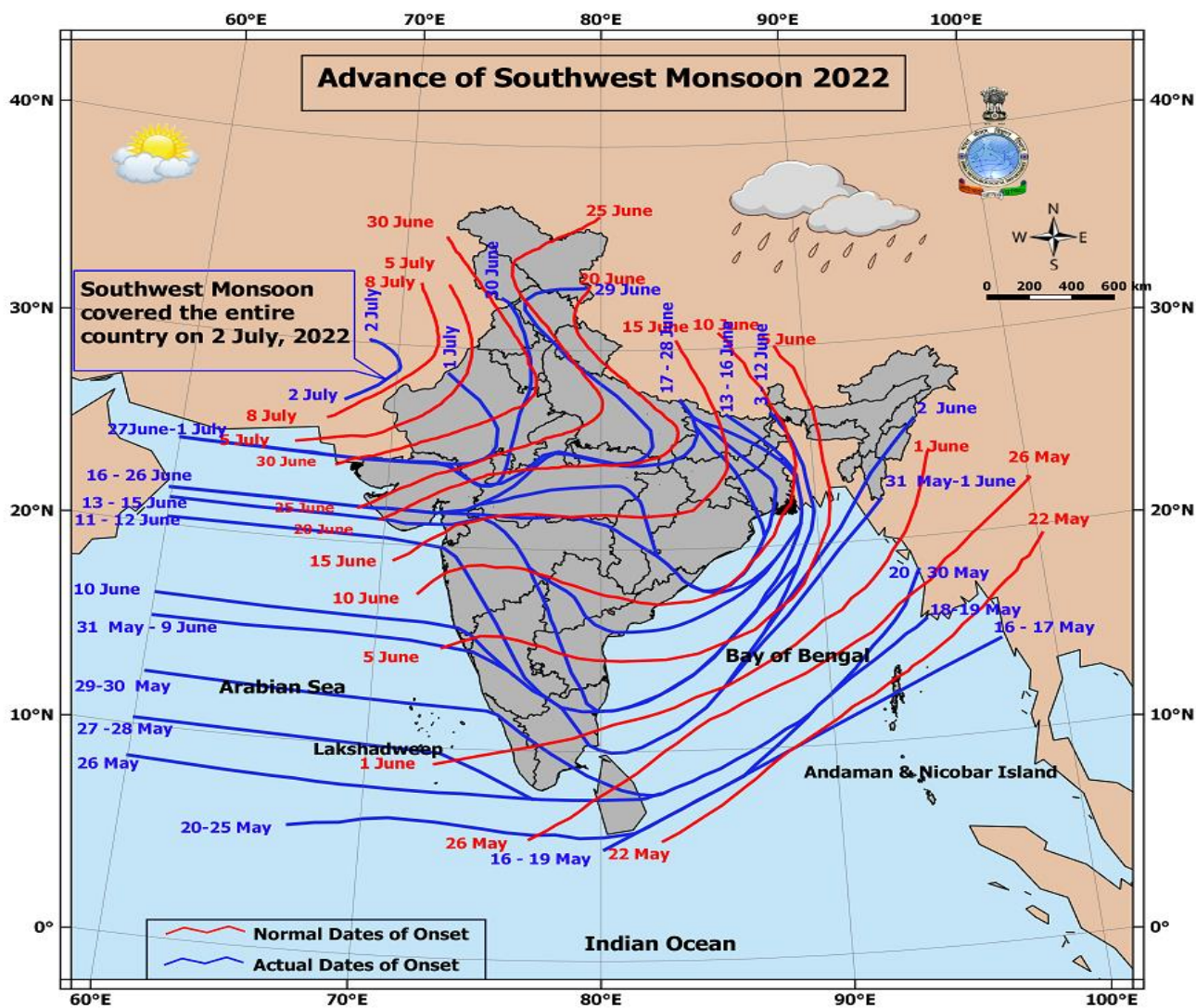


Fig 1:- Isochrones of advance of monsoon 2022

Withdrawal of SW monsoon began from southwest Rajasthan and adjoining Kutch on 20th September, 2022 against its normal date of 17th September. The withdrawal line of Southwest Monsoon passed through Khajuwala, Bikaner, Jodhpur, and Naliya on the 20th and remained there till the 28th of September 2022. It further withdrew from the entire Punjab & Chandigarh, some parts of Jammu & Kashmir, Himachal Pradesh, West Uttar Pradesh and Haryana, the entire Delhi and some more parts of Rajasthan on 29th September, 2022.

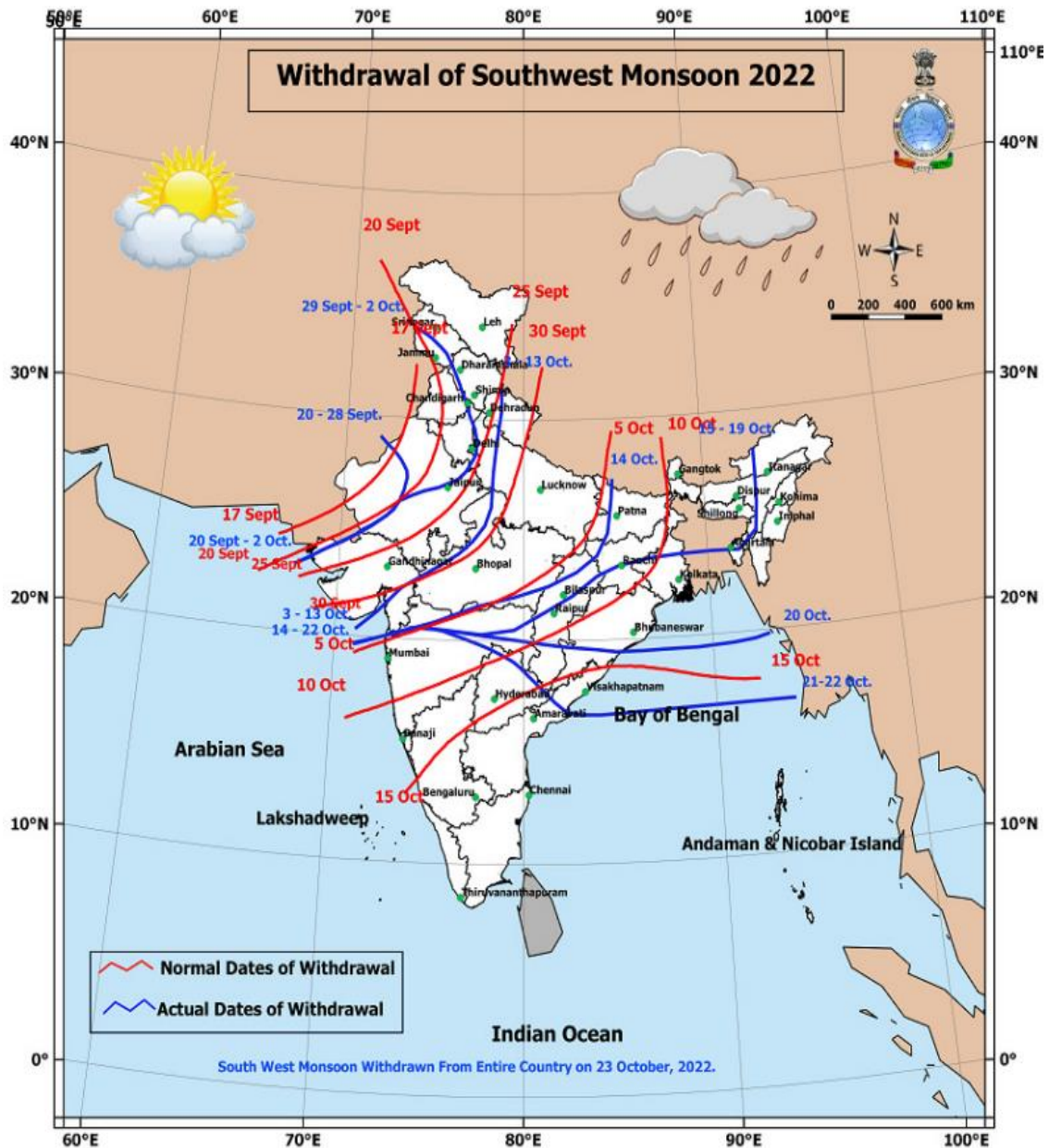


Fig 2:- Isochrones of Withdrawal of SW monsoon 2022

2. Chief Synoptic Features

In August 2022, Rajasthan experienced the impact of a weather system linked to Depression BOB 05, which originated over the Bay of Bengal. After forming as a low-pressure area, it intensified into a depression and traveled across central India before weakening over southwestern Rajasthan. At 12:00 UTC (17:30 IST) of 17 August, the depression finally weakened into a well-marked low pressure over southwestern Rajasthan. The system caused widespread heavy rainfall across Odisha, West Bengal, Jharkhand, Central India and Rajasthan.

There were six Monsoon Depressions formed during the season; out of that, one system intensified into Deep Depression during 19-23 August. Out of six Depressions, four systems formed in August, one in July and one in September. The tracks of these systems are shown in **Fig 3**. The information on the number of low-pressure systems formed during the season are given in **Table 1**. The number of low pressure system days was 67 during the season against the normal of 57 days.

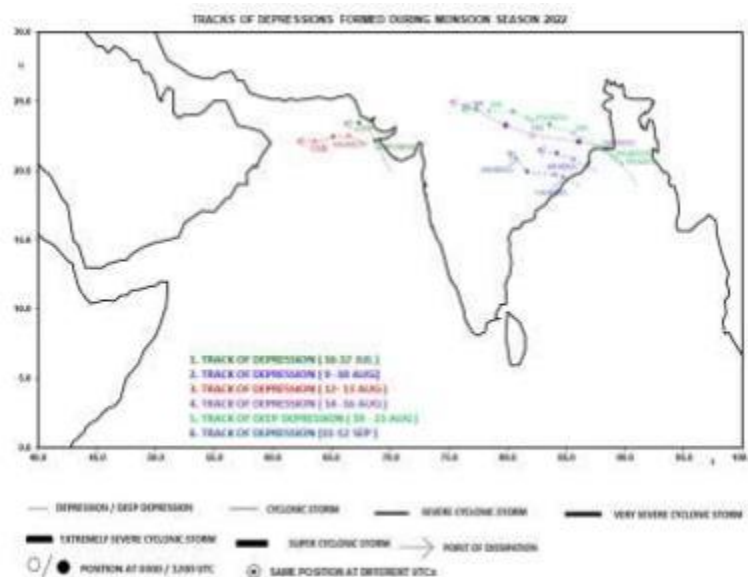


Fig 3: Tracks of the Depressions and Deep Depressions formed during Monsoon 2022

Table 1: Number of Low-pressure System (LPS) including Low (L), Well Marked Low (WML), Depression (D), Deep Depression (DD), Cyclonic Storm (CS) in monsoon 2022.

Systems/ Month	CS	DD	D	WML	L	Total Systems
June	0	0	0	0	1	1
July	0	0	1	2	1	4
August	0	1	3	0	0	4
September	0	0	1	0	2	3

Table 2: District-wise seasonal rainfall distribution monsoon 2022

CUMULATIVE RAINFALL STATISTICS (01/06/2022 to 30/09/2022)				
SR NO.	NAME	ACTUAL RAINFALL (MM)	NORMAL RAINFALL (MM)	DEPARTURE FROM NORMAL
1	RAJASTHAN	595.9	435.6	37
2	EAST RAJASTHAN	780.7	626.6	25
3	WEST RAJASTHAN	448.9	283.6	58
EAST RAJASTHAN				
1	AJMER	573.1	458.3	25
2	ALWAR	615.8	545.9	13
3	BANSWARA	998.3	886	13
4	BARAN	1049.2	832	26
5	BHARATPUR	572.7	543.3	5
6	BHILWARA	675.2	604.5	12
7	BUNDI	920.5	644.4	43
8	CHITTORGARH	785.8	727.2	8
9	DAUSA	784.2	594.5	32
10	DHOLPUR	696.3	584.1	19
11	DUNGARPUR	829.5	706.5	17
12	JAIPUR	652.8	524.3	24
13	JHALAWAR	1317.1	884.3	49
14	JHUNJHUNU	406.5	408.8	-1
15	KARAULI	582	595.8	-2
16	KOTA	1150.8	732.2	57
17	PRATAPGARH	1129.6	914.2	24
18	RAJSAMAND	617	538.1	15
19	SAWAI MADHOPUR	749	661.5	13
20	SIKAR	490.4	407.1	20
21	SIROHI	1074.7	873	23
22	TONK	802.4	566.8	42
23	UDAIPUR	889.5	617.7	44
WEST RAJASTHAN				
24	BARMER	476	272.7	75
25	BIKANER	437.4	247	77
26	CHURU	508.7	334	52
27	HANUMANGARH	317.9	253.6	25
28	JAISALMER	346.7	176.9	96
29	JALORE	626.4	417.8	50
30	JODHPUR	457.5	292.6	56
31	NAGAU	510.8	369.5	38
32	PALI	540.6	491.6	10
33	SRI GANGANAGAR	400.5	204.7	96

Stationwise Total Seasonal Rainfall

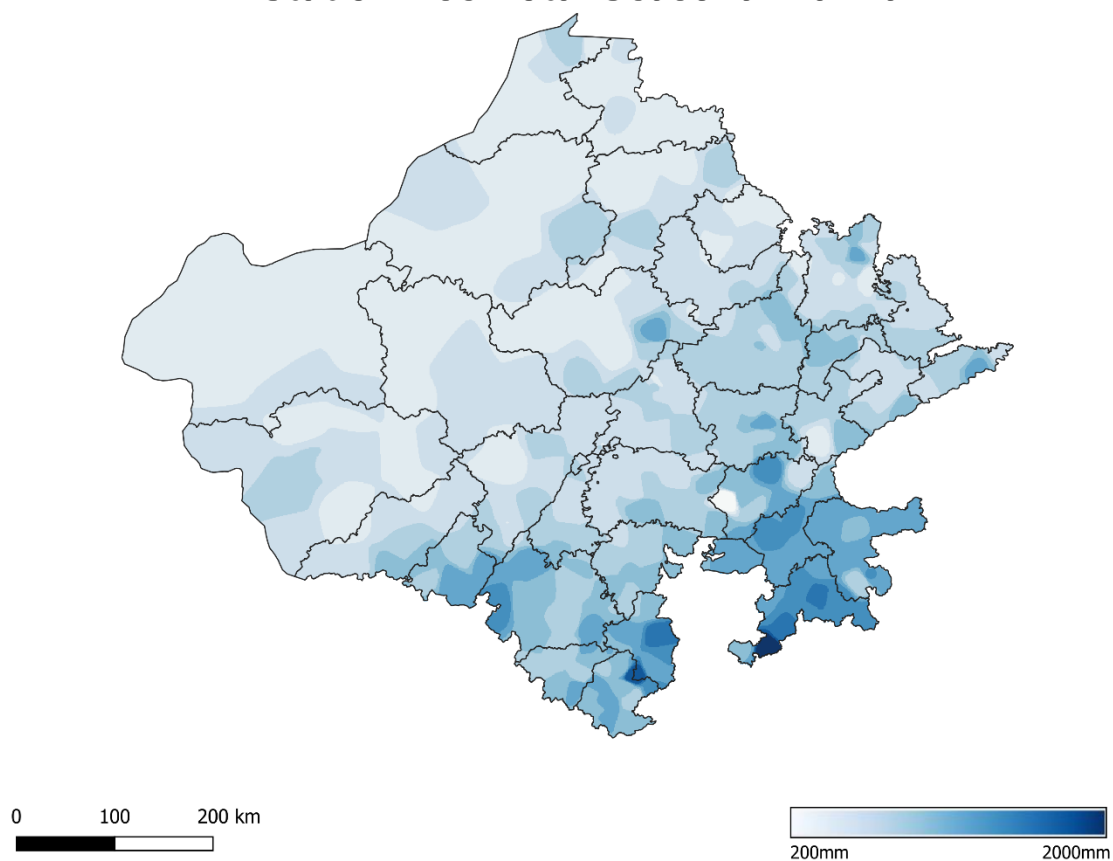


Fig 5.: Station wise Total Seasonal Rainfall

The monthly rainfall during monsoon season (June to September) for the State as a whole and its two meteorological sub divisions is given in the table below with respective LPA values.

Table 3: Rainfall during southwest monsoon 2022 over Rajasthan

Month	Actual (in mm)	Long period average LPA (in mm)	Departure from normal %
June	55.1	55.0	0
July	270.2	161.4	+67
August	216.6	155.7	+39
September	54.2	63.5	-15

Table 4: Rainfall during southwest monsoon 2022 over East Rajasthan

Month	Actual (in mm)	Long period average LPA (in mm)	Departure from normal %
June	66.1	74.7	-12
July	331.4	228.6	+45
August	284.5	231.5	+23
September	98.7	91.8	+8

Table 5: Rainfall during southwest monsoon 2022 over West Rajasthan

Month	Actual (in mm)	Long period average LPA (in mm)	Departure from normal %
June	46.4	39.4	+18
July	221.4	107.8	+105
August	162.5	95.5	+70
September	18.7	40.9	-54

From the above tables it is observed that Rajasthan received highest rainfall during the month of July, which was 167 % of LPA (i.e. excess category). Both East Rajasthan and West Rajasthan received their highest rainfall during month of July which was 145 % of LPA (excess) and 205 % of LPA (large excess) respectively.

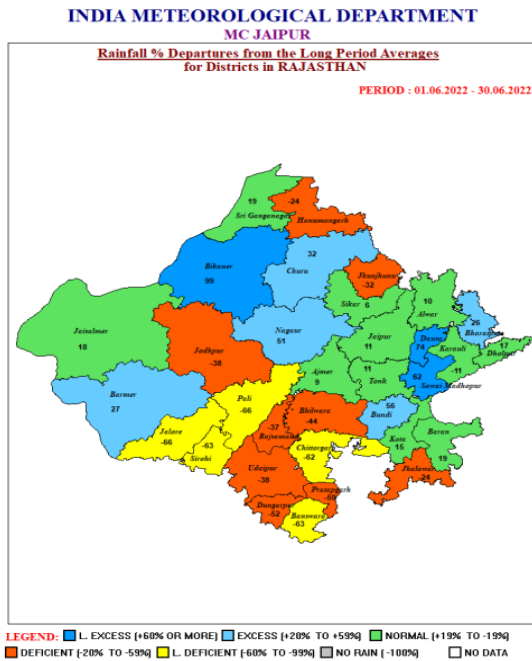


Fig.6 Districtwise Monthly Rainfall Distribution Over Rajasthan – June

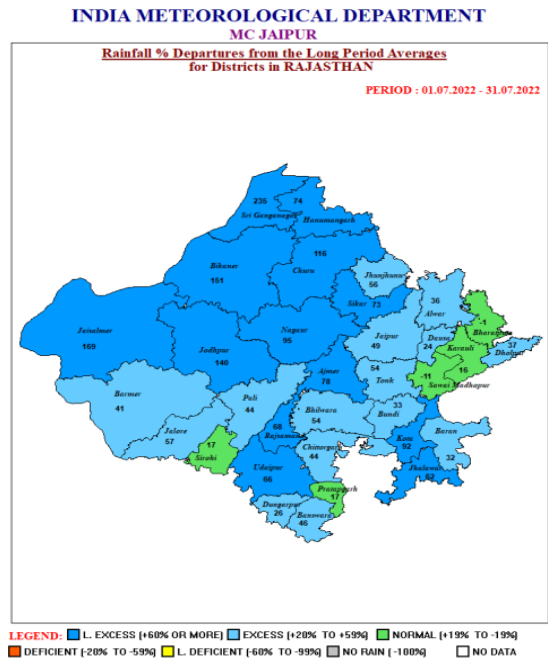


Fig. 7 Districtwise Monthly Rainfall Distribution Over Rajasthan - July



Fig. 8 Districtwise Monthly Rainfall Distribution Over Rajasthan - August



Fig. 9 Districtwise Monthly Rainfall Distribution Over Rajasthan - September

Month wise very heavy and extremely heavy rainfall events are shown in **Fig.10** and **Fig. 11** respectively.

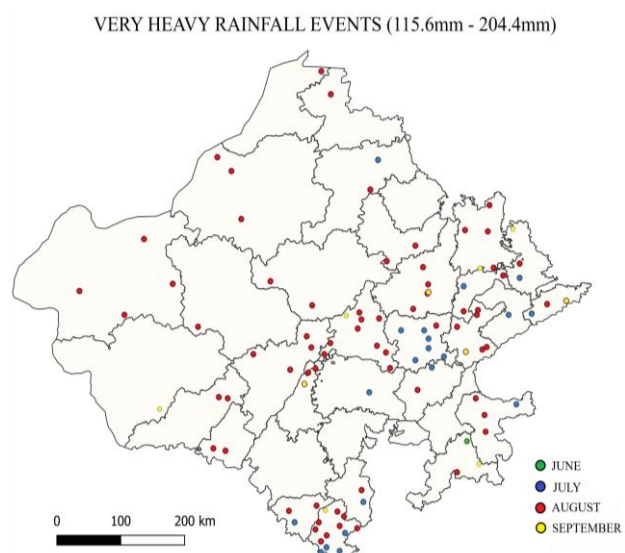


Fig. 10: The location of Very Heavy Rainfall (115.6 to 204.4 mm)

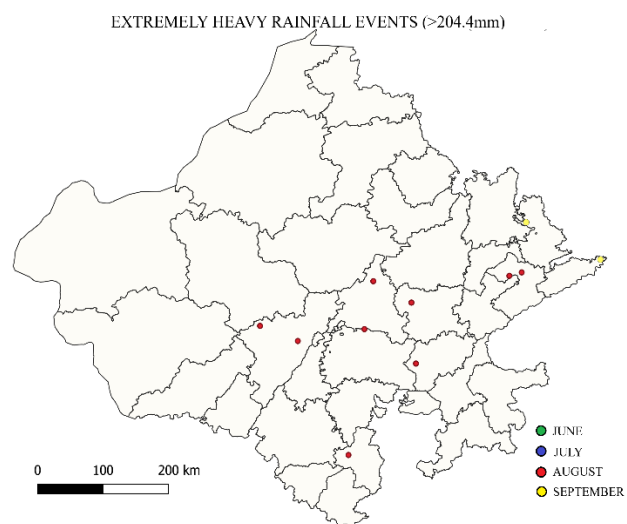


Fig. 11: The location of Extremely Heavy Rainfall (more than 204.4 mm)

Table 6: Monthwise Highest Rainfall recorded during southwest monsoon 2022

	Station	District	Rainfall Amount (in mm)	Recording Date
June	Chohtan	Barmer	130.0	14/06/2022
July	Sriganganagar	Sriganganagar	260.0	15/07/2022
August	Dug	Jhalawar	289.0	23/08/2022
September	Behror	Alwar	145.0	24/09/2022

Table 7: District-wise Monthly Rainfall Distribution Over Rajasthan (June-September)

	JUNE	JULY	AUGUST	SEPTEMBER
LARGE EXCESS	03	13	08	03
EXCESS	05	15	08	06
NORMAL	11	05	11	10
DEFICIENT	09	00	06	11
LARGE DEFICIENT	05	00	00	03

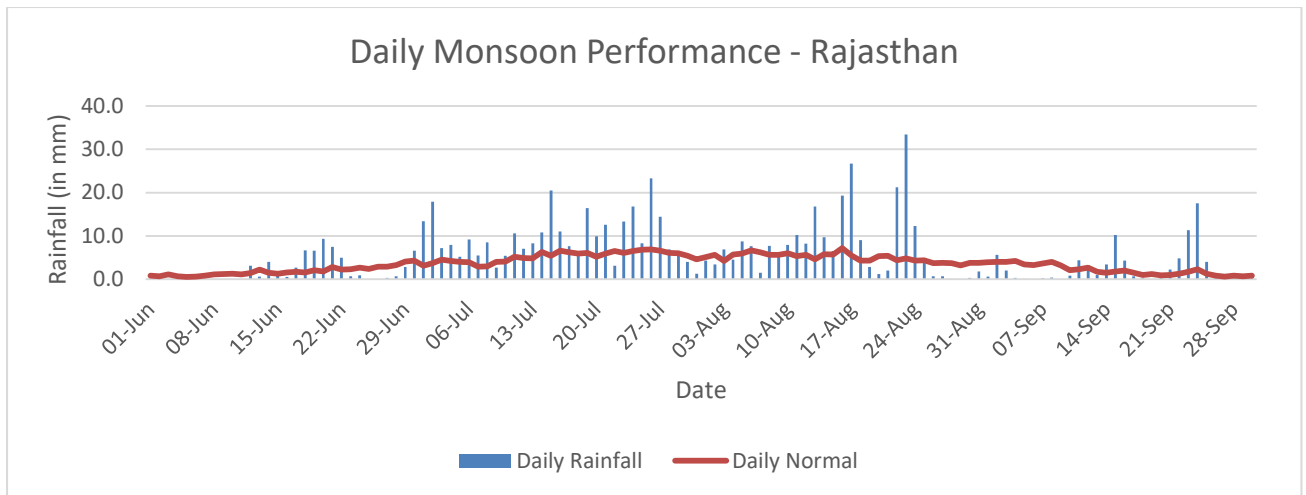


Fig. 12: Daily Rainfall - Rajasthan

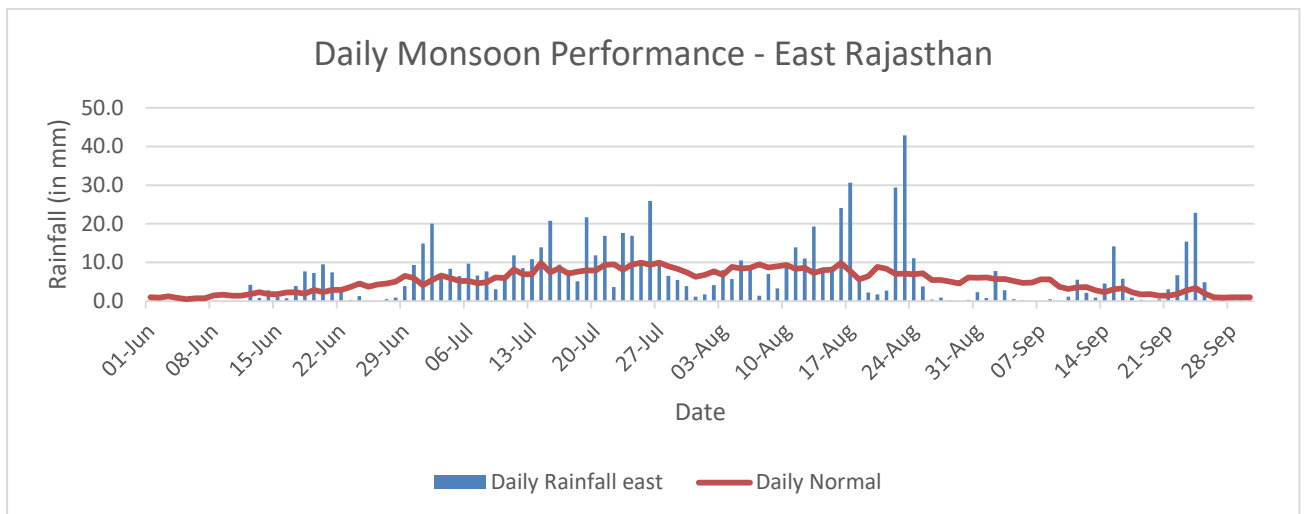


Fig. 13: Daily Rainfall – East Rajasthan

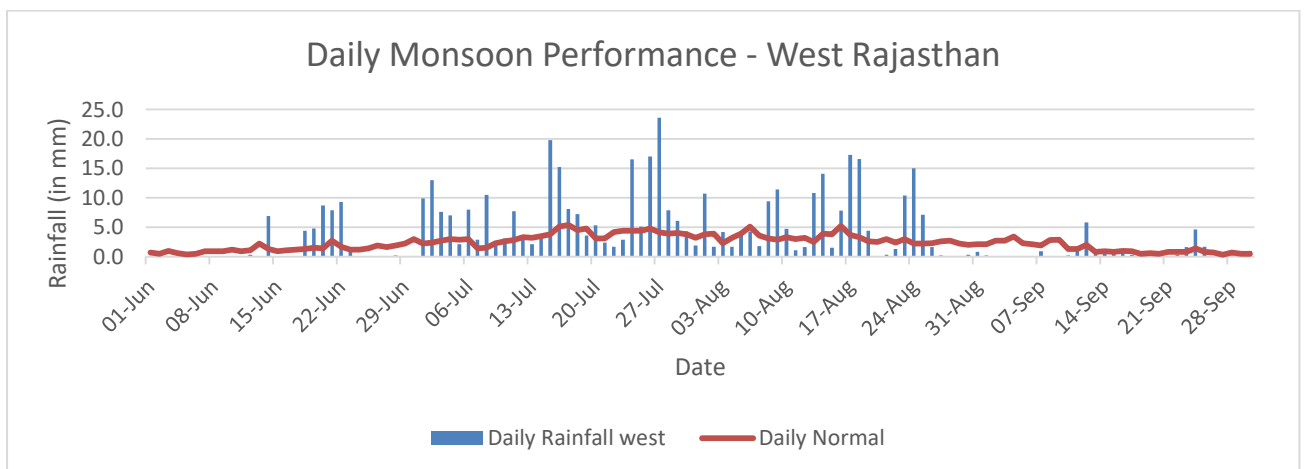


Fig. 14: Daily Rainfall – West Rajasthan

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