

## SOUTH WEST MONSOON SEASON REPORT 2024

### HARYANA

### Main Highlights

- Monsoon advanced some parts of Haryana on 28<sup>th</sup> June and covered entire state on 02<sup>nd</sup> July 2024. Earliest onset so far in Haryana is 13<sup>th</sup> June 2008 and latest is 27<sup>th</sup> July 1987.
- Long Range Forecast issued on 15<sup>th</sup> April 2024 for 2024 southwest monsoon seasonal (June to September) rainfall over the country as a whole is most likely to be above normal (>104% of the Long Period Average (LPA)). Quantitatively, the seasonal rainfall over the country as a whole is likely to be 106% of LPA with a model error of  $\pm 5\%$ .
- Monsoon rainfall (June – September) was 108% of LPA for country as a whole and 107% of LPA for NW India.
- Haryana (including Chandigarh), State received 409.4 mm of rainfall (June-September) against its normal of 430.7 during monsoon 2024 with overall negative departure of 5% which is in normal range.
- Rainfall in Haryana was normal in year 2024. For last decade (since 2011) normal rainfall was recorded in year 2011 and 2018 also. Lowest rainfall in Haryana since 1901 was in year 1987 with overall deficit of 63.6%.
- Rainfall distribution for the month of June, July, August & September was 53%, 58%, 126% and 137% respectively.
- Out of 22 districts for which rainfall was reported in Haryana during monsoon 2024, 10 districts received normal rainfall, 3 districts received excess whereas rainfall in 08 districts was deficient and 1 was large excess. District Karnal observed highest deficit of 38 % and district Panchkula, Yamuna Nagar having deficit of 31% each respectively. District Nuh observed highest excess of 70% respectively.
- Monsoon withdrew from Haryana on 02<sup>th</sup> October 2024.
- The forecast for the rainfall over the country as whole during the season as a whole was correct as the realized rainfall is 108% of LPA against the forecast of  $106\% \pm 4\%$ .

# 1. Monsoon performance, rainfall distributions and associated Meteorological Conditions during Monsoon 2024 (June to September) in Haryana

## Onset and Advance

Monsoon advanced insome parts of Haryana on 28th June and covered entire state on 2<sup>nd</sup> July 2024.Earliest onset so far in Haryana is 13<sup>th</sup>June 2008 and latest is 27th July 1987.Monsoon advanced over Kerala coast on 30<sup>th</sup>May coinciding with its normal date of arrival thereafter it followed normal pattern. Advancement of monsoon in Haryana is shown in Figure 1 below.

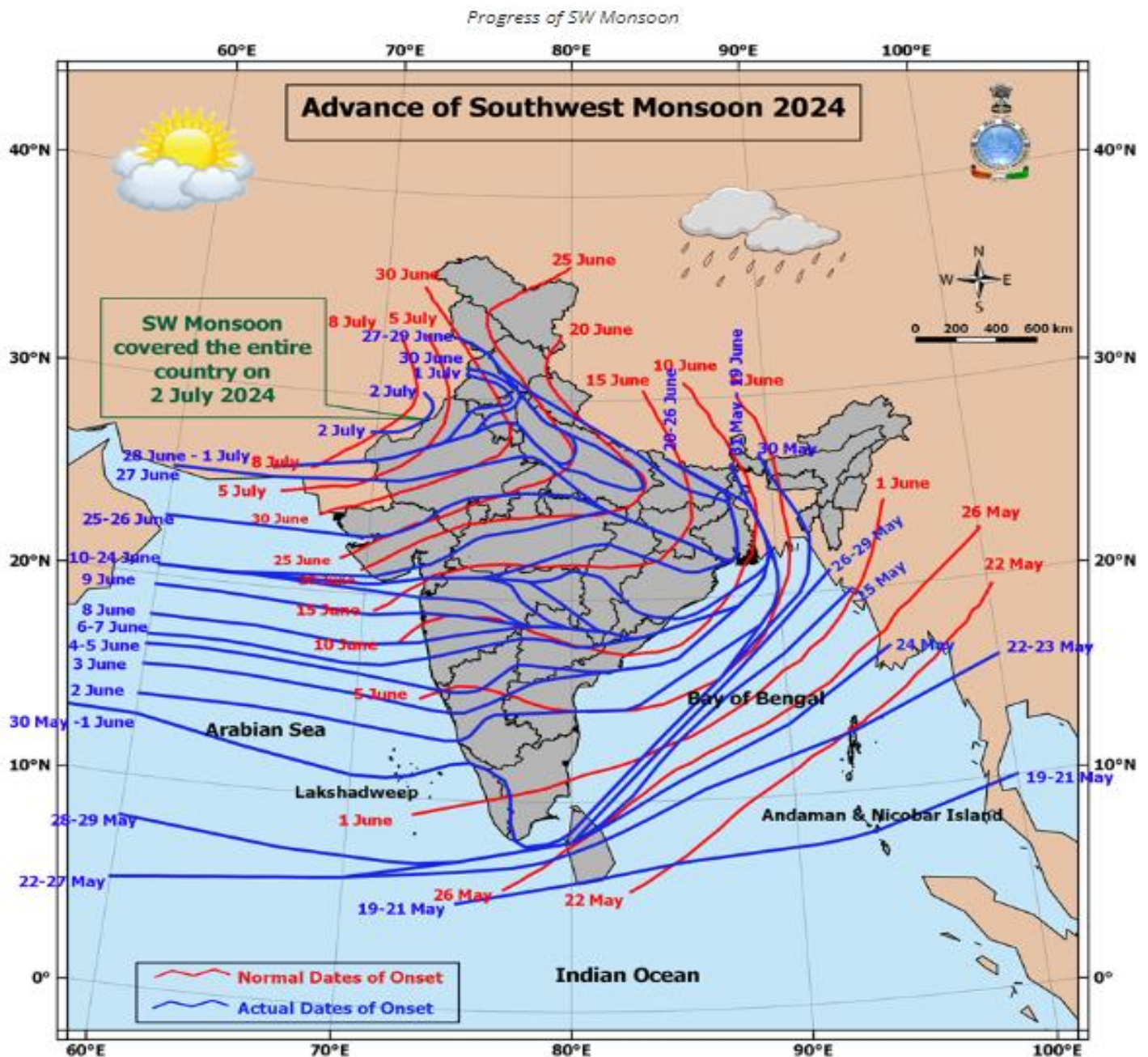
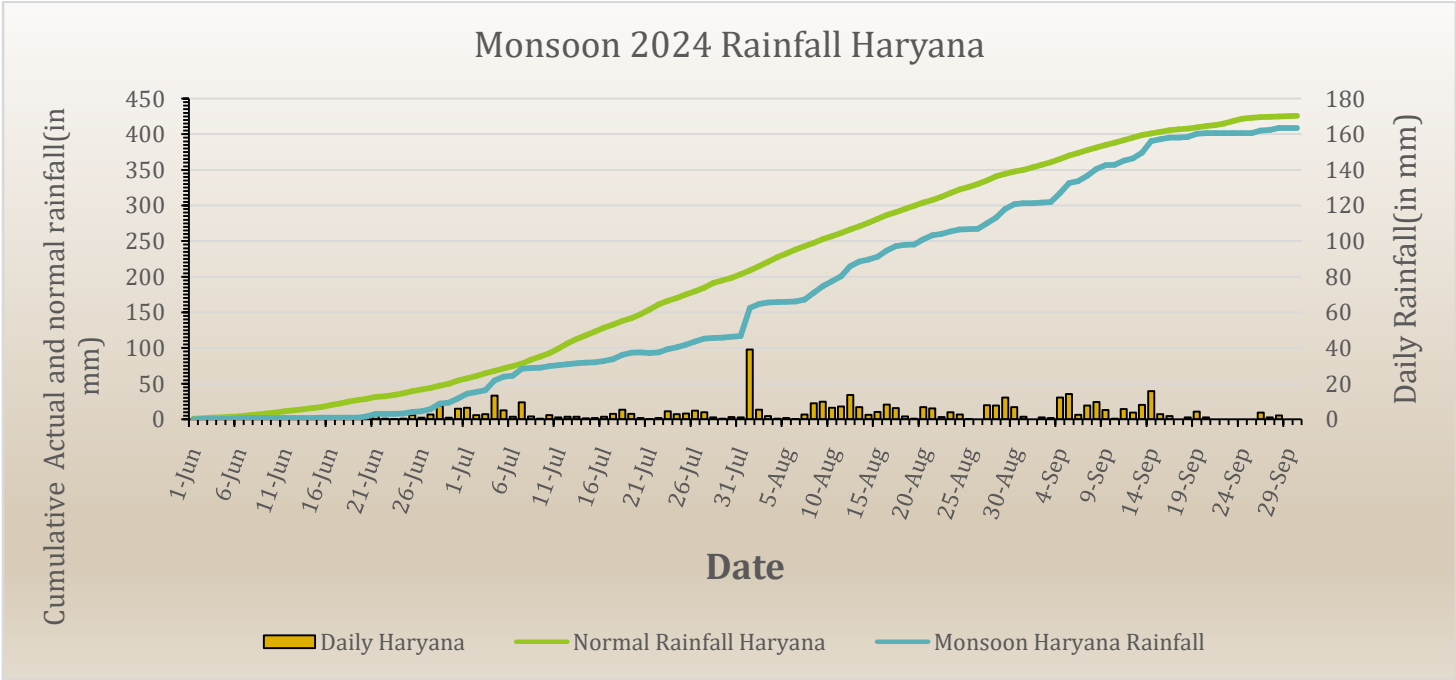


Figure 1: Advance of Southwest Monsoon 2024

**Rainfall Distribution in Haryana**

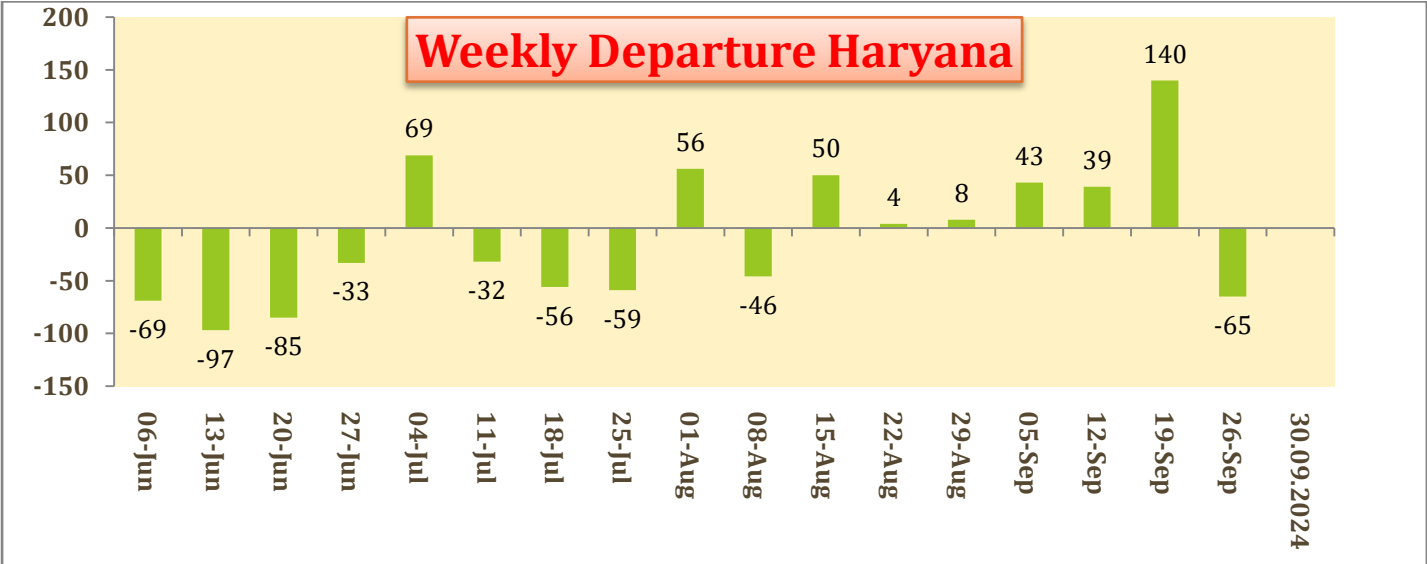
Haryana State received 409.4 mm of rainfall against its average of 426 mm with negative departure of 05% during Monsoon 2024. Daily time series of rainfall from (June to September) during monsoon 2024 in Haryana along with cumulative and normal is shown in Figure 2. Cumulative rainfall followed normal curve till ending August thereafter due to excess rainfall in the month of September overall deficit of 5 % was created. Rainfall during the month of September was 39% above LPA.

**Figure 2: Daily cumulative Monsoon rainfall Haryana 2024**



**Weekly Departure of Rainfall**

Weekly departure of Rainfall is shown in Figure 3. As evident from the Figure 3 there was very large positive departure of rainfall during 16<sup>th</sup> week, large positive departures in 5<sup>th</sup>, 9<sup>th</sup>, 11<sup>th</sup>, 14<sup>th</sup> and 15<sup>th</sup> week and small positive departure in 12<sup>th</sup> and 13<sup>th</sup> week of monsoon season and in rest part of monsoon negative departures were seen.

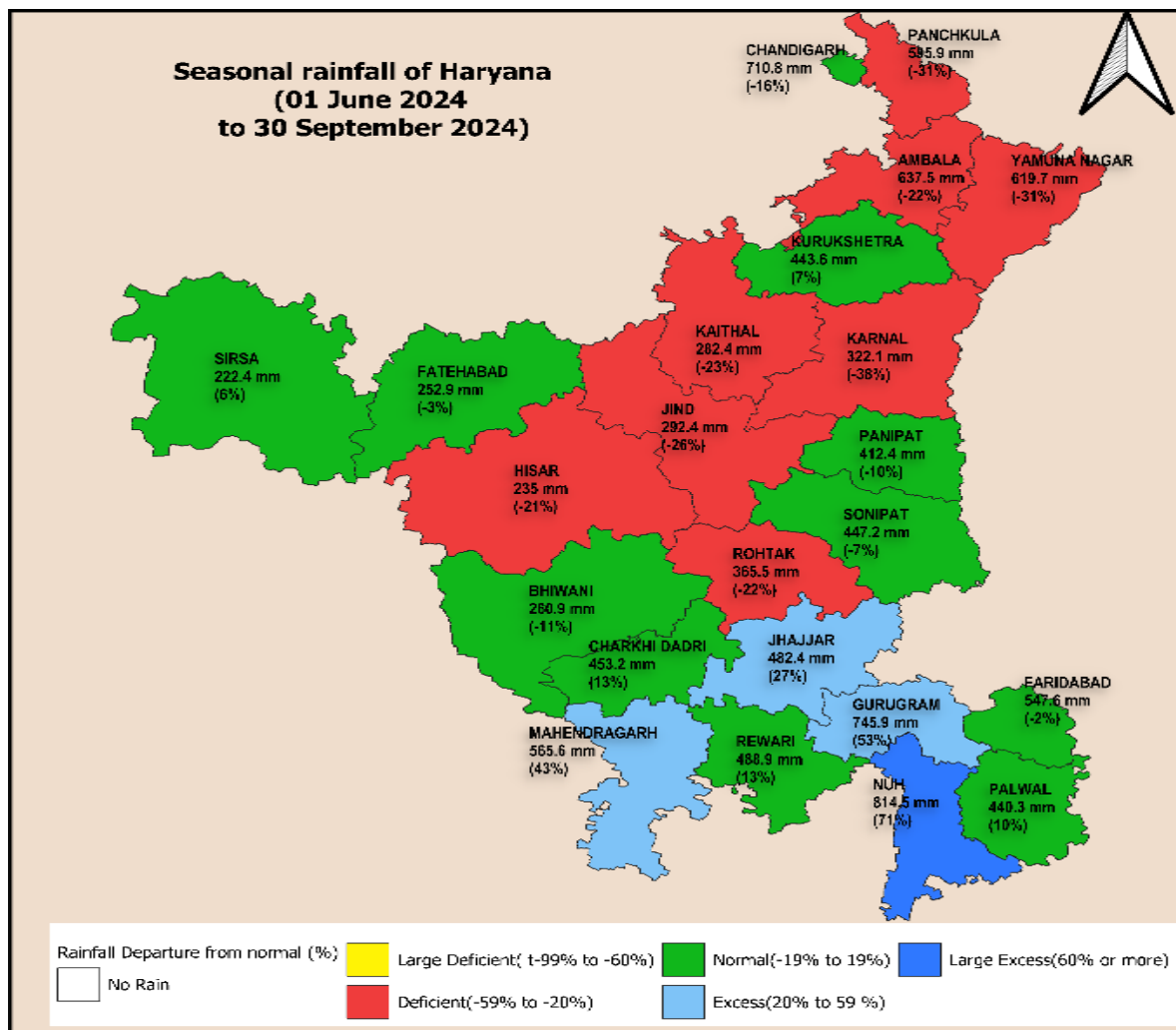


**Figure 3: Weekly Rainfall % Departure**

## District wise Rainfall Status

Out of 22 districts for which rainfall was reported in Haryana during monsoon 2024, 10 districts received normal rainfall, 1 district received large excess, 3 districts received excess whereas rainfall in 08 districts was deficient. District KARNAL observed highest deficit (-38 %) followed by district PANCHKULA (-31%). District NUH observed highest positive departure in rainfall (+70%) followed by district GURUGRAM (+43%) and MAHENDRAGARH (+29%). Percentage departure of district wise rainfall from normal is shown in Figure 4 below.

**Figure 4: District wise % Departure of Rainfall for Haryana state during Monsoon 2024.**



| <u>Monsoon 2024 Rainfall</u> |                      |                          |          |
|------------------------------|----------------------|--------------------------|----------|
| Region                       | Actual Rainfall (mm) | Long Period Average (mm) | % Of LPA |
| All India                    | 934.8                | 868.6                    | 108%     |
| NW India                     | 628.6                | 587.6                    | 107%     |
| Haryana                      | 409.4                | 430.7                    | 95%      |

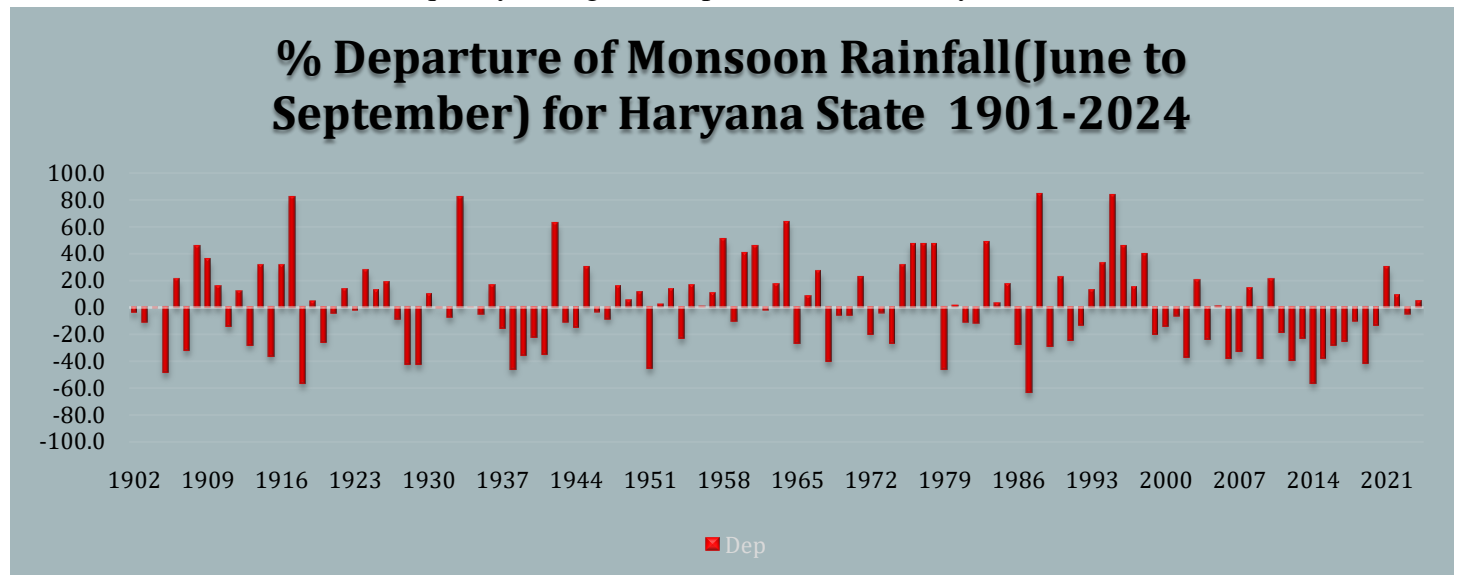
## Monthly Rainfall Distribution

Monthly rainfall distribution for the month of June, July August and September and for first & second half of Monsoon 2024for Haryana is shown below.

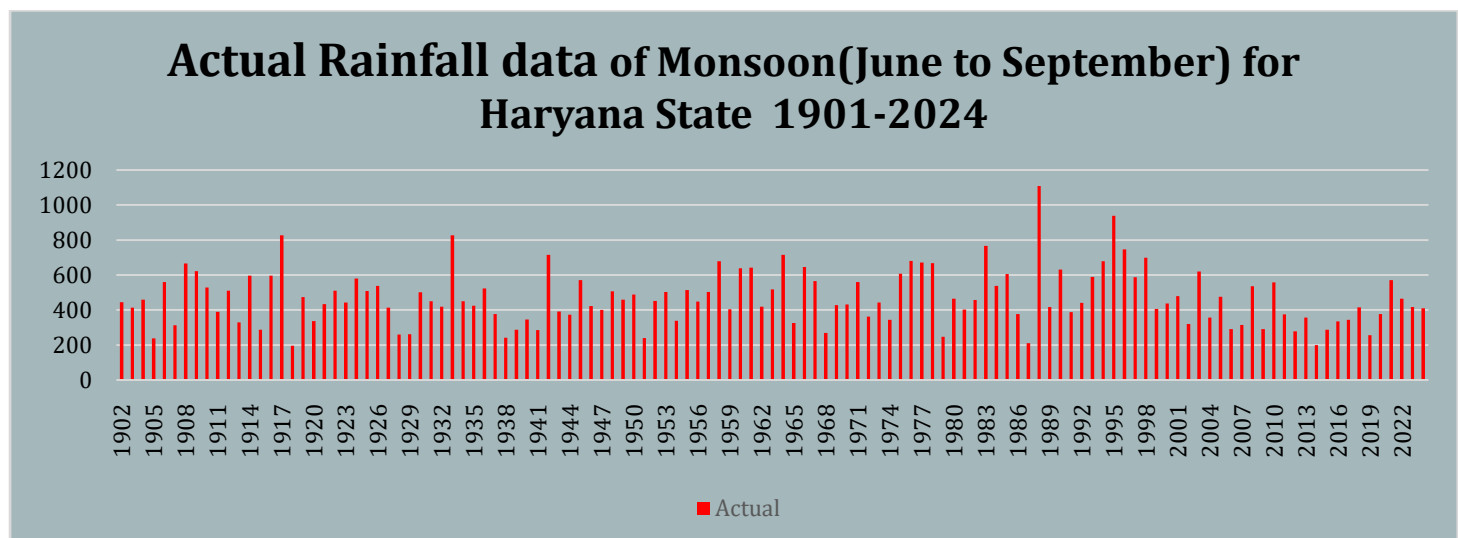
| Months                                  | Actual (mm) | Normal (mm) | % of LPA |
|---|-------------|-------------|----------|
| June                                    | 29.3        | 55.3        | -47      |
| July                                    | 88.0        | 150.5       | -42      |
| August                                  | 186.4       | 147.7       | 26       |
| September                               | 105.7       | 77.2        | 37       |
| June – July (1 <sup>st</sup> Half)      | 117.3       | 205.8       | -43      |
| August –September(2 <sup>nd</sup> Half) | 292.1       | 224.9       | 30       |

## Monsoon Rainfall trend since 1901-2024

Departure of Monsoon rainfall since 1901 for Haryana is shown in Figure 5.A peculiar feature of the last decade (2011-2024) is that it has been the longest period with negative departure of rainfall since 1901. Overall last 2 decades has seen more frequency of negative departures and deficit year as well.



**Figure 5: % Departure of Monsoon rainfall since 1901 for Haryana.**

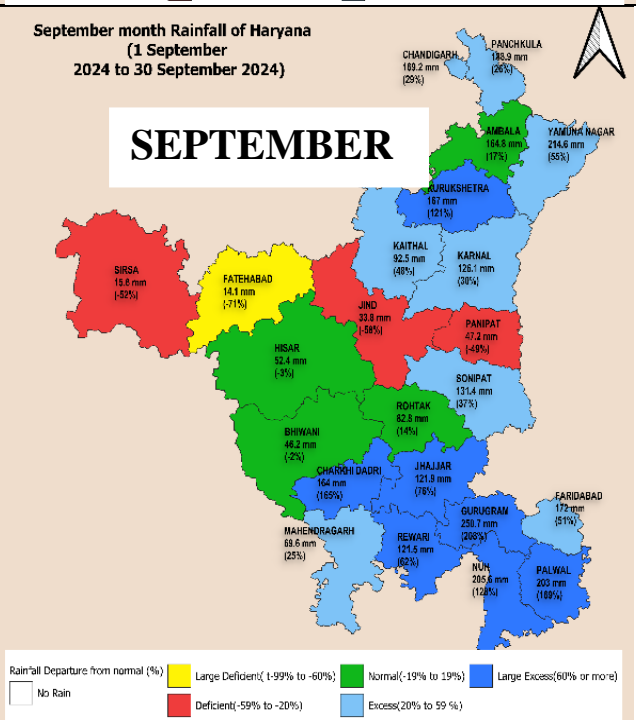
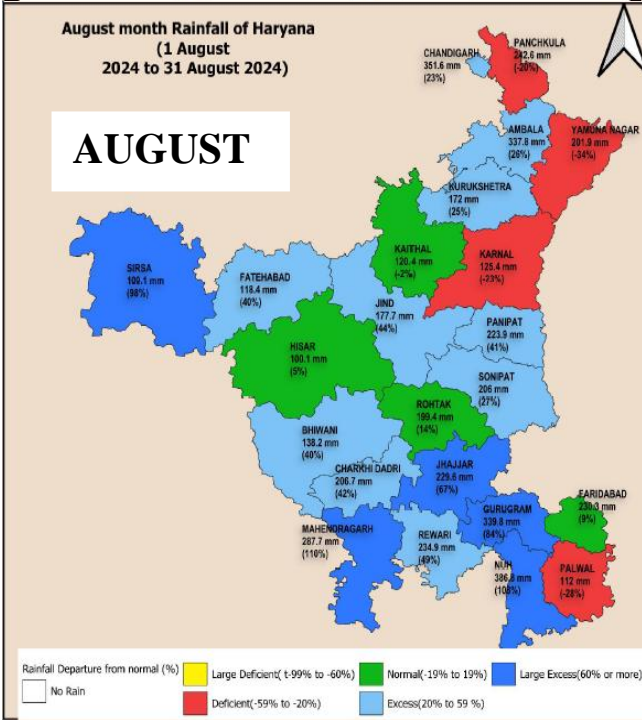
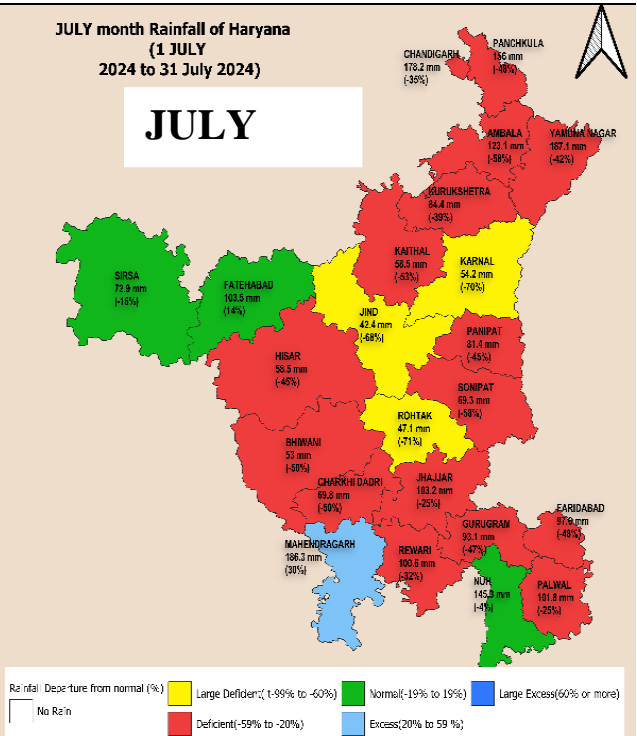
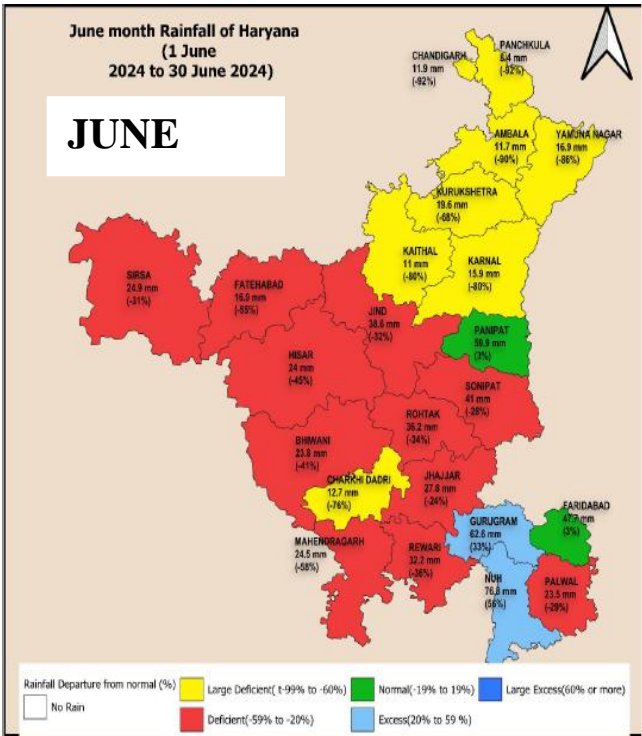


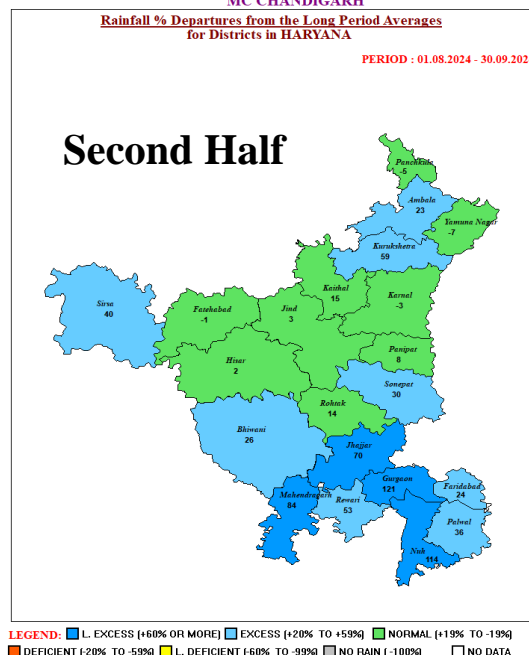
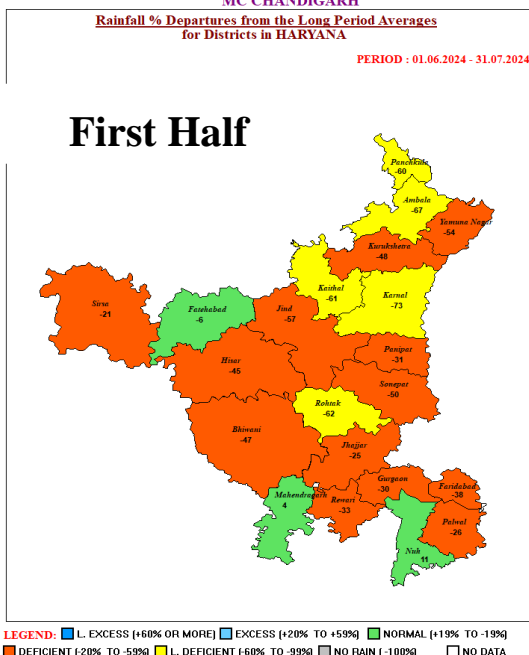
**Figure 6: Actual Rainfall of Monsoon since 1901 for Haryana.**



District wise excess, large excess, deficient, large deficient and normal rainfall for month of June, July, August and September of Monsoon 2024 in Haryana is shown in the following table.

| MONTHS    | L.EXCESS | EXCESS | NORMAL | DEFICIENT | LARGE DEFICIENT | NO RAIN |
|-----------|----------|--------|--------|-----------|-----------------|---------|
| June      | 0        | 2      | 2      | 11        | 7               | 0       |
| July      | 0        | 1      | 3      | 15        | 3               | 0       |
| August    | 5        | 9      | 4      | 4         | 0               | 0       |
| September | 7        | 7      | 4      | 3         | 1               | 0       |
| Season    | 1        | 3      | 10     | 8         | 0               | 0       |





## Main Features of Monthly Rainfall during Monsoon :

### June

- In June 2024, Haryana state received 29.3 mm of rainfall against 55.3 mm of long period average which is 47% less than LPA.
- Highest rainfall in Haryana during last 124 (1901–2024) is 162.1 mm in year 1936(June) which was 330.8% of LPA followed by year 2001 and 2008 with rainfall of 155.1 mm and 150.6 mm respectively.
- The rainfall during June 2024 was 47% less than LPA with 18 districts showing negative departures and 4 districts showing positive departures from LPA.

### July

- State received 87.8 mm of rainfall in July 2024 against its normal rainfall of 150.5 mm which is 42% less than LPA.
- Highest rainfall received in Haryana during July month during (1901–2024) was in year 1964 when state received 390.8 mm of rainfall against its normal rainfall of 150.3 mm which is 260% of LPA followed by 1988 and 1994 when state received 389.8 mm and 346.3 mm of rainfall respectively.
- Lowest rainfall in July during (1901–2024) was in 1918 when state received 19.8 mm of rainfall against 157.1 mm with deficit of 87.7% followed by year 2004 and 1911 when rainfall was 21.0 mm and 27.6 mm respectively.
- The rainfall during July 2024 was 42% less than LPA with 20 districts showing negative departures and 2 districts showing positive departures from LPA.

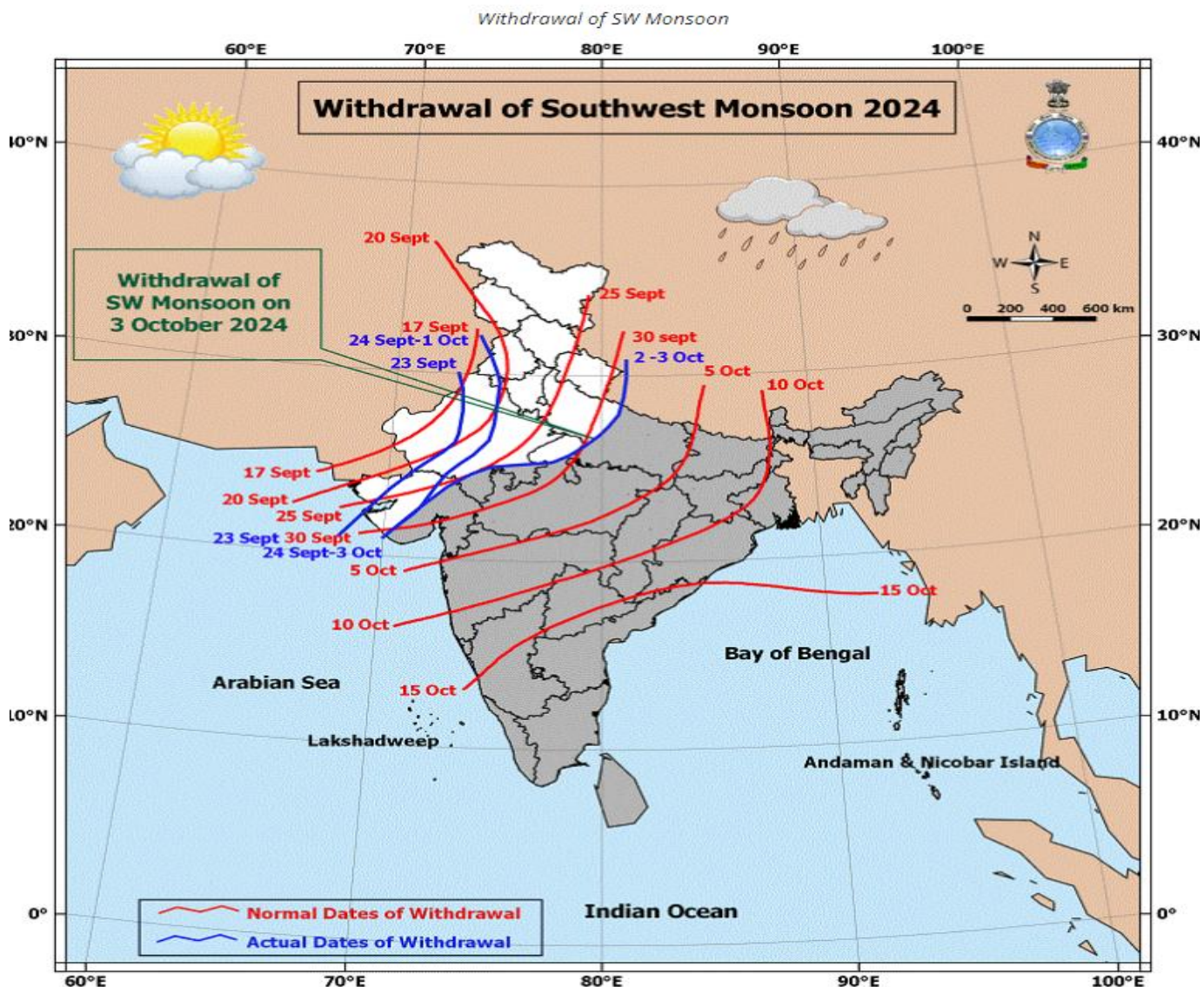
### August

- In August month, Haryana received 186.6 mm of rainfall against its normal of 147.7 mm and was 26% more than LPA.
- The rainfall during August 2024 was 26% more than LPA with 05 districts showing negative departures and 17 districts showing positive departures from LPA.
- State experienced couple of heavy (7-11cm) to very heavy rainfall (12 - 20cm) in August 2024 as shown in Tables given below.

### September

- State received 105.7 mm of rainfall against its normal of 77.2 mm and was 37% more than LPA.
- During the last decade rainfall was highest in the year 2018 followed by this year wherein state received 161%, 137% of rainfall excess rainfall from normal.
- Highest rainfall received in Haryana during September month during (1901–2024) was in year 1917 when state received 343.0 mm of rainfall against its normal rainfall of 103.0 mm which is 333 % of LPA followed by 1933 and 1945 when state received 316.2 mm and 293.7 mm of rainfall respectively.
- State experienced couple of spells of heavy rainfall (more than 7cm) during first week of September.

# Withdrawal of Monsoon 2024



In view of setting up of North westerly winds over Northwest India and reduction of moisture in water vapour imageries in the region monsoon withdrew from Haryana on 02<sup>nd</sup> October 2024.

## Vigorous and Active Days of Monsoon Season 2024 (Haryana)

| Date      | Monsoon Status  |
|-----------|-----------------|
| 04-Jul-24 | <b>VIGOROUS</b> |
| 01-Aug-24 | <b>VIGOROUS</b> |
| 08-Aug-24 | <b>ACTIVE</b>   |
| 10-Aug-24 | <b>ACTIVE</b>   |
| 12-Aug-24 | <b>ACTIVE</b>   |
| 16-Aug-24 | <b>ACTIVE</b>   |
| 17-Aug-24 | <b>ACTIVE</b>   |
| 21-Aug-24 | <b>ACTIVE</b>   |
| 27-Aug-24 | <b>ACTIVE</b>   |
| 29-Aug-24 | <b>ACTIVE</b>   |
| 30-Aug-24 | <b>ACTIVE</b>   |
| 04-Sep-24 | <b>ACTIVE</b>   |
| 05-Sep-24 | <b>ACTIVE</b>   |
| 07-Sep-24 | <b>ACTIVE</b>   |
| 08-Sep-24 | <b>ACTIVE</b>   |
| 13-Sep-24 | <b>ACTIVE</b>   |
| 14-Sep-24 | <b>VIGOROUS</b> |



# District wise Heavy to Very Heavy Rainfall Events(>6cm) (June to September) 2024 in Haryana

| DISTRICT WISE HEAVY RAINFALL EVENTS IN JUNE TO SEPTEMBER 2024 IN HARYANA |            |                     |              |                |
|--|------------|---------------------|--------------|----------------|
| MONTH  | DATE       | STATION             | DISTRICT     | RAINFALL(incm) |
| JUNE   | 06/28/2024 | Mandkhola Aws       | Jhajjar      | 13             |
|  | 06/28/2024 | Dhauj               | Faridabad    | 12             |
|  | 06/28/2024 | Gurgaon Aws         | Gurgaon      | 10             |
|  | 06/28/2024 | Sohana              | Gurgaon      | 8              |
|  | 06/28/2024 | Loharu              | Bhiwani      | 7              |
| JULY   | 07/04/2024 | Jhirka              | Nuh          | 8              |
|  | 07/04/2024 | Ambala Rev          | Ambala       | 7              |
|  | 07/04/2024 | Badli Rev           | Jhajjar      | 6              |
|  | 07/04/2024 | Beri                | Jhajjar      | 6              |
|  | 07/04/2024 | Barwala Rev         | Jhajjar      | 6              |
|  | 07/04/2024 | Sohana              | Gurgaon      | 6              |
|  | 07/04/2024 | Jhirka              | Nuh          | 8              |
|  | 07/04/2024 | Ambala Rev          | Ambala       | 7              |
| AUGUST   | 07/04/2024 | Badli Rev           | Jhajjar      | 6              |
|  | 07/04/2024 | Beri                | Jhajjar      | 6              |
|  | 08/01/2024 | Ambala Cantt        | Ambala       | 18             |
|  | 08/01/2024 | Ambala              | Ambala       | 14             |
|  | 08/01/2024 | Mulana              | Ambala       | 13             |
|  | 08/01/2024 | Nahar Rev           | Rewari       | 13             |
|  | 08/01/2024 | Kosli               | Rewari       | 13             |
|  | 08/01/2024 | Gurgaon Aws         | Gurgaon      | 12             |
|  | 08/01/2024 | Ambala Rev          | Ambala       | 11             |
|  | 08/01/2024 | Jhirka              | Nuh          | 11             |
|  | 08/01/2024 | Sahlawas            | Jhajjar      | 11             |
|  | 08/01/2024 | Gurgaon Rev         | Gurgaon      | 11             |
|  | 08/01/2024 | Palhawas Rev        | Rewari       | 10             |
|  | 08/01/2024 | Madluda Rev         | Panipat      | 10             |
|  | 08/12/2024 | Chandigarh          | Chandigarh   | 13             |
|  | 08/12/2024 | Chandigarh Aws      | Chandigarh   | 12             |
|  | 08/12/2024 | Ambala Rev          | Ambala       | 11             |
|  | 08/12/2024 | Chandigarh Iaf      | Chandigarh   | 8              |
|  | 08/12/2024 | Ambala              | Ambala       | 8              |
|  | 08/12/2024 | Gurgaon Kvk Aws     | Gurgaon      | 8              |
|  | 08/12/2024 | Sohana              | Gurgaon      | 7              |
|  | 08/12/2024 | Manesar Rev         | Gurgaon      | 7              |
|  | 08/12/2024 | Gurgaon Rev         | Gurgaon      | 7              |
|  | 08/12/2024 | Panchkula           | Panchkula    | 7              |
|  | 08/12/2024 | Nilokheri           | Karnal       | 7              |
|  | 08/12/2024 | Kalka               | Panchkula    | 7              |
|  | 08/12/2024 | Shahbad             | Kurukshetra  | 6              |
|  | 08/12/2024 | Ambala Cantt        | Ambala       | 6              |
|  | 08/29/2024 | Samalkha            | Panipat      | 8              |
|  | 08/29/2024 | Ismailabad          | Kurukshetra  | 6              |
|  | 08/29/2024 | Ganaur              | Sonipat      | 6              |
|  | 08/29/2024 | Israna              | Sonipat      | 6              |
|  | 08/29/2024 | Jhansa Irr          | Kurukshetra  | 6              |
| SEPTEMBER  | 09/04/2024 | Nilokheri           | Karnal       | 8              |
|  | 09/04/2024 | Hissar              | Hisar        | 7              |
|  | 09/04/2024 | Karnal Rev          | Karnal       | 6              |
|  | 09/04/2024 | Jhansa Irr          | Kurukshetra  | 6              |
|  | 09/04/2024 | Kurukshetra Kvk Aws | Kurukshetra  | 6              |
|  | 09/04/2024 | Dubwali             | Sirsa        | 6              |
|  | 09/04/2024 | Nilokheri           | Karnal       | 8              |
|  | 09/04/2024 | Hissar              | Hisar        | 7              |
|  | 09/05/2024 | Boundkalan Rev      | Jhajjar      | 11             |
|  | 09/05/2024 | Dadri Toye Edu Fmo  | Rewari       | 9              |
|  | 09/05/2024 | Jhahhar             | Yamuna Nagar | 8              |
|  | 09/05/2024 | Farukhnagar         | Gurgaon      | 8              |
|  | 09/05/2024 | Nuh                 | Nuh          | 8              |
|  | 09/05/2024 | Tajewala            | Yamuna Nagar | 7              |
|  | 09/05/2024 | Dadri               | Rewari       | 7              |
|  | 09/05/2024 | Sohana              | Gurgaon      | 7              |
|  | 09/05/2024 | Manesar Rev         | Gurgaon      | 7              |
|  | 09/05/2024 | Kalanaur            | Rohtak       | 7              |
|  | 09/14/2024 | Pataudi             | Gurgaon      | 21             |
|  | 09/14/2024 | Nahar Rev           | Rewari       | 13             |
|  | 09/14/2024 | Kosli               | Rewari       | 13             |
|  | 09/14/2024 | Palhawas Rev        | Rewari       | 9              |
|  | 09/14/2024 | Taoru               | Nuh          | 8              |
|  | 09/14/2024 | Faridabad           | Faridabad    | 8              |
|  | 09/14/2024 | Dadri               | Rewari       | 7              |
|  | 09/14/2024 | Sohana              | Gurgaon      | 7              |
|  | 09/14/2024 | Nuh                 | Nuh          | 7              |
|  | 09/14/2024 | Bhadkal             | Bhiwani      | 7              |
|  | 09/14/2024 | Gurgaon Rev         | Gurgaon      | 6              |
|  | 09/14/2024 | Manesar Rev         | Gurgaon      | 6              |
|  | 09/14/2024 | Bahadurgarh         | Jhajjar      | 6              |

**District wise Very Heavy Rainfall Events (>12cm ) June to September 2024 in Haryana**

| <b>District wise very heavy rainfall events in June to September 2024 in Haryana</b> |            |               |         |                  |
|--|------------|---------------|---------|------------------|
|  | DATE       | DISTRICT      | STATION | RAINFALL (in cm) |
| JUNE   | 06/28/2024 | Mandkhola Aws | Jhajjar | 13               |
| JULY   | -          | -             | -       | -                |
| AUG  | 08/01/2024 | Ambala Cantt  | Ambala  | 18               |
|  | 08/01/2024 | Ambala        | Ambala  | 14               |
|  | 08/01/2024 | Mulana        | Ambala  | 13               |
|  | 08/01/2024 | Nahar Rev     | Rewari  | 13               |
|  | 08/01/2024 | Kosli         | Rewari  | 13               |
| SEPT   | 09/14/2024 | Pataudi       | Gurgaon | 21               |

**HEAVY TO VERY HEAVY RAINFALL EVENTS IN DURING MONSOON 2024.**

**June:** In the month of **June** 2024 one districts of Haryana received heavy to very heavy rainfall spell on 06<sup>th</sup>**June** 2024

**August:**In the month of **August**2024 two districts of Haryanareceived heavy to very heavy rainfall spell on01<sup>th</sup>**August**2024

**September:** In the month of **September** 2024 one districts of Haryana received heavy to very heavy rainfall spell on 14<sup>th</sup>**September** 2024.

## Monsoon forecast verification 2024

The first stage forecast for the seasonal (June-September) rainfall over the country as a whole issued in April was 104% of LPA with a model error of  $\pm 5\%$ . The updated forecast issued on 27<sup>th</sup> May was 106% of LPA with a model error of  $\pm 4\%$  of LPA. The actual seasonal rainfall for the country as a whole was 108% of LPA.

Considering the four broad geographical regions of India, the forecasts issued in May for the seasonal rainfall over Northwest India, Central India, Northeast India and South Peninsula were 92-108%, 106%, 94% & 106% of the LPA respectively with model errors of  $\pm 8\%$ . The actual rainfall over Northwest India, Central India, Northeast India and South Peninsula was 107%, 119%, 086% and 114% of the LPA respectively. Thus, the forecasts of season rainfall over the Central India was underestimated to the actual rainfall, while the forecast for other regions were nearly estimated. Realized rainfall for Haryana was 95% of LPA hence was normal.

### **Forecast issued and realized rainfall monsoon 2024**

| <b>Region</b>    | <b>Period</b> | <b>Stage of forecast</b>                     | <b>Forecast % of LPA</b> | <b>Actual rainfall %LPA</b> |
|------------------|---------------|--|--------------------------|-----------------------------|
| <b>All India</b> | June-Sept     | 1 <sup>st</sup> Stage 15 <sup>th</sup> April | $>104 \pm 5\%$           | 108%                        |
| <b>All India</b> | June-Sept     | 2nd Stage 27 <sup>th</sup> May               | $106 \pm 4\%$            |                             |
| <b>NW India</b>  | June-Sept     | 27 <sup>th</sup> May                         | $92-108 \pm 8\%$         | 107%                        |
| <b>Haryana</b>   | June-Sept     | -  | -                        | 95%                         |

## Excess, Normal and Deficient Monsoon years in Haryana (1901-2024)

| Haryana (1901-2024)   |      |      |      |      |      |                                  |      |      |      |      |       |                               |       |       |       |       |       |  |
|---|------|------|------|------|------|----------------------------------|------|------|------|------|-------|-------------------------------|-------|-------|-------|-------|-------|--|
| Monthly and seasonal (June-September) rainfall anomalies observed during extreme Southwest monsoon years for the period 1901-2024 for Haryana |      |      |      |      |      |                                  |      |      |      |      |       |                               |       |       |       |       |       |  |
| Excess Monsoon Rainfall Years   |      |      |      |      |      | Deficient Monsoon Rainfall Years |      |      |      |      |       | Normal Monsoon Rainfall Years |       |       |       |       |       |  |
| YEAR  | JUN  | JUL  | AUG  | SEP  | JJAS | YEAR                             | JUN  | JUL  | AUG  | SEP  | JJAS  | YEAR                          | JUN   | JUL   | AUG   | SEP   | JJAS  |  |
| 1906  | 61.9 | -5.8 | -18  | 98.3 | 21.3 | 1901                             | -65  | -17  | 24.9 | -88  | -25.1 | 1902                          | 54.1  | 15.5  | -29.7 | -26.2 | -4.1  |  |
| 1908  | -74  | 36.6 | 190  | -88  | 45.3 | 1905                             | -55  | -36  | -77  | -24  | -48.5 | 1903                          | -80.1 | 0.3   | -1.8  | -7.4  | -10.9 |  |
| 1909  | 159  | 49.4 | -19  | 32.4 | 35.6 | 1907                             | -73  | -31  | 27.6 | -99  | -32.3 | 1904                          | -34.6 | -18.7 | 22.2  | 10.8  | -0.8  |  |
| 1914  | -7.7 | 64.8 | -32  | 87.6 | 31   | 1913                             | 133  | -24  | -43  | -91  | -28   | 1910                          | 29.3  | -22.0 | 14.0  | 67.3  | 15.2  |  |
| 1916  | 27.2 | -3.2 | 76.3 | 21   | 31   | 1915                             | -22  | -55  | -46  | -3.3 | -36.8 | 1911                          | 16.1  | -82.6 | -59.5 | 137.3 | -14.7 |  |
| 1917  | 41   | 25.6 | 49.1 | 233  | 81.8 | 1918                             | -25  | -88  | -8.7 | -93  | -56.9 | 1912                          | -46.0 | 8.1   | -0.5  | 61.2  | 11.5  |  |
| 1924  | -64  | -35  | 20.1 | 176  | 27.4 | 1920                             | 64.9 | 33.8 | -75  | -92  | -25.8 | 1919                          | -81.3 | 41.6  | 32.2  | -50.7 | 4.4   |  |
| 1933  | 186  | -18  | 66.2 | 207  | 81.9 | 1928                             | -36  | -18  | -53  | -70  | -42.8 | 1921                          | -65.9 | -37.0 | 57.9  | -14.8 | -4.8  |  |
| 1942  | 10.3 | 83.6 | 61.3 | 57.8 | 62.8 | 1929                             | -60  | -16  | -35  | -86  | -42.6 | 1922                          | 67.2  | -12.4 | -24.5 | 81.3  | 13.5  |  |
| 1945  | -25  | -25  | -7.8 | 189  | 29.9 | 1938                             | 28.2 | -28  | -61  | -90  | -46.3 | 1923                          | -57.4 | 10.3  | 56.8  | -80.2 | -2.7  |  |
| 1958  | -63  | 26.7 | 39.9 | 157  | 50.5 | 1939                             | 77.8 | -54  | -68  | -17  | -35.9 | 1925                          | 178.0 | 58.7  | -20.7 | -91.0 | 12.3  |  |
| 1960  | -30  | 45.8 | 146  | -84  | 40.4 | 1940                             | -31  | -10  | 13   | -86  | -22.2 | 1926                          | -69.6 | 43.7  | 71.0  | -53.3 | 18.2  |  |
| 1961  | 10.4 | 15.4 | 149  | -35  | 45.7 | 1941                             | 94   | -77  | -29  | -42  | -35.2 | 1927                          | -73.2 | 1.2   | 42.3  | -67.0 | -9.2  |  |
| 1964  | -82  | 160  | 50.3 | 5.4  | 63.5 | 1951                             | -67  | -68  | -5.5 | -57  | -45.5 | 1930                          | 44.6  | 97.2  | -38.6 | -71.8 | 9.9   |  |
| 1967  | -59  | 14.1 | 94.4 | -7.8 | 26.7 | 1954                             | -53  | 8.6  | -74  | 11.4 | -23.4 | 1931                          | -82.6 | 28.7  | -16.7 | 15.4  | -0.9  |  |
| 1971  | 47.1 | 7    | 77.1 | -40  | 22.9 | 1965                             | -98  | -28  | -9.8 | -18  | -26.9 | 1932                          | -74.8 | -18.7 | -16.4 | 53.2  | -7.8  |  |
| 1975  | 21.4 | 3.7  | 41.4 | 63.2 | 30.8 | 1968                             | -37  | 13.6 | -58  | -100 | -40.6 | 1934                          | 30.0  | -4.5  | 52.5  | -82.0 | -0.1  |  |
| 1976  | 52.8 | 33.5 | 139  | -59  | 47.1 | 1972                             | -50  | -14  | 30.7 | -85  | -20.1 | 1935                          | -84.1 | 19.2  | -13.8 | 6.2   | -5.5  |  |
| 1977  | 20.2 | 104  | 23   | 5    | 47.2 | 1974                             | -35  | 16.9 | -30  | -86  | -27   | 1936                          | 230.8 | -10.2 | 5.3   | -31.0 | 16.3  |  |
| 1978  | 39.1 | 38.3 | 66.8 | 34.6 | 47   | 1979                             | -5   | -11  | -75  | -78  | -45.8 | 1937                          | 3.3   | 10.4  | -69.9 | 9.5   | -16.2 |  |
| 1983  | -16  | 78.9 | 79.8 | -12  | 48   | 1986                             | 46.7 | -57  | -12  | -39  | -27.6 | 1943                          | -44.5 | -18.5 | -2.4  | 3.9   | -11.0 |  |
| 1988  | 74.9 | 94   | 62.7 | 103  | 83.7 | 1987                             | -9.7 | -82  | -44  | -89  | -63.6 | 1944                          | 23.4  | 11.6  | -34.9 | -45.9 | -15.2 |  |
| 1990  | -9.8 | -27  | 34.2 | 95.9 | 22.4 | 1989                             | -5.6 | -40  | -2.8 | -61  | -28.9 | 1946                          | 75.2  | -4.5  | 27.4  | -81.1 | -3.6  |  |
| 1994  | 27.7 | 98.1 | 24.7 | -59  | 32.4 | 1991                             | 42.1 | -68  | 19.2 | -57  | -24.4 | 1947                          | -69.5 | -59.4 | -39.7 | 133.6 | -8.6  |  |
| 1995  | 25.5 | -0.6 | 161  | 117  | 83   | 1999                             | 72.5 | -15  | -44  | -35  | -20.7 | 1948                          | -74.0 | 31.8  | 75.3  | -51.2 | 15.2  |  |
| 1996  | 190  | -30  | 76   | 49.1 | 45.4 | 2002                             | -33  | -85  | -35  | 44.1 | -37.8 | 1949                          | -81.9 | 108.1 | -60.5 | -17.5 | 5.3   |  |
| 1998  | 128  | 21.7 | 4.2  | 81.5 | 39.6 | 2004                             | 50.6 | -88  | 48.9 | -76  | -24   | 1950                          | -74.6 | 35.5  | 13.3  | 10.0  | 11.0  |  |
| 2003  | 24.7 | 67.2 | 1.9  | -37  | 20.3 | 2006                             | 27.4 | -13  | -79  | -41  | -38.2 | 1952                          | 15.1  | -28.8 | 105.7 | -99.0 | 2.4   |  |
| 2010  | -53  | 4.3  | 10.3 | 108  | 20.9 | 2007                             | 123  | -57  | -44  | -43  | -33.1 | 1953                          | 30.9  | 62.1  | 8.8   | -60.0 | 13.6  |  |



|      |     |      |       |       |    |      |       |       |       |       |       |      |       |       |       |       |       |
|------|-----|------|-------|-------|----|------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|
| 2021 | 2.0 | 64.0 | -48.0 | 135.0 | 30 | 2009 | -66   | -54   | -67   | 59.4  | -38.2 | 1955 | 29.9  | -28.8 | 25.7  | 64.2  | 16.2  |
|      |     |      |       |       |    | 2012 | -90   | -67   | -1    | -40   | -39.6 | 1956 | -13.7 | 49.4  | 8.6   | -76.8 | 0.7   |
|      |     |      |       |       |    | 2013 | 33    | -43   | -6    | -47   | -23   | 1957 | -50.6 | 33.7  | -32.8 | 66.8  | 10.7  |
|      |     |      |       |       |    | 2014 | 42.9  | -56   | -79.8 | 15.5  | -56.5 | 1959 | -56.6 | -34.3 | 17.8  | 7.9   | -10.5 |
|      |     |      |       |       |    | 2015 | -4    | -22   | -51   | -60   | -38   | 1962 | -64.9 | -2.0  | -22.8 | 52.6  | -2.5  |
|      |     |      |       |       |    | 2016 | -23   | -5.3  | -22.2 | -82.9 | -26.8 | 1963 | -4.7  | -58.3 | 103.5 | 19.2  | 16.6  |
|      |     |      |       |       |    | 2017 | 167.0 | -58.7 | -58.1 | 2.0   | -25.7 | 1966 | 121.6 | -27.4 | 61.5  | -55.7 | 8.3   |
|      |     |      |       |       |    | 2019 | -61   | -17   | -47   | -72   | -42   | 1969 | -80.3 | -15.5 | -3.7  | 36.9  | -6.4  |
|      |     |      |       |       |    |      |       |       |       |       |       | 1970 | 38.5  | -53.9 | 27.6  | -2.9  | -6.3  |
|      |     |      |       |       |    |      |       |       |       |       |       | 1973 | 55.9  | -26.5 | 32.2  | -51.4 | -4.3  |
|      |     |      |       |       |    |      |       |       |       |       |       | 1980 | -1.0  | 60.5  | -30.5 | -43.7 | 1.5   |
|      |     |      |       |       |    |      |       |       |       |       |       | 1981 | 61.3  | 39.8  | -49.9 | -67.7 | -10.8 |
|      |     |      |       |       |    |      |       |       |       |       |       | 1982 | -13.3 | 1.7   | 36.2  | -95.0 | -11.5 |
|      |     |      |       |       |    |      |       |       |       |       |       | 1984 | 23.4  | -4.7  | 27.3  | -25.4 | 3.5   |
|      |     |      |       |       |    |      |       |       |       |       |       | 1985 | 4.4   | 91.5  | 1.8   | -64.3 | 17.1  |
|      |     |      |       |       |    |      |       |       |       |       |       | 1992 | -51.0 | -24.3 | 24.9  | -40.2 | -13.2 |
|      |     |      |       |       |    |      |       |       |       |       |       | 1993 | 22.9  | 77.9  | -73.8 | 42.6  | 12.7  |
|      |     |      |       |       |    |      |       |       |       |       |       | 1997 | 102.0 | -6.3  | 52.5  | -56.5 | 14.4  |
|      |     |      |       |       |    |      |       |       |       |       |       | 2000 | 74.1  | 19.2  | -41.1 | -68.3 | -14.8 |
|      |     |      |       |       |    |      |       |       |       |       |       | 2001 | 204.7 | 6.3   | -29.9 | -88.1 | -6.6  |
|      |     |      |       |       |    |      |       |       |       |       |       | 2005 | 38.5  | 16.2  | -67.4 | 84.9  | 1.3   |
|      |     |      |       |       |    |      |       |       |       |       |       | 2008 | 249.4 | -31.8 | -1.8  | 18.3  | 14.1  |
|      |     |      |       |       |    |      |       |       |       |       |       | 2011 | 76.9  | -54.3 | -32.2 | 29.7  | -18.8 |
|      |     |      |       |       |    |      |       |       |       |       |       | 2018 | 40.1  | -10.6 | -55.0 | 60.6  | -9.7  |
|      |     |      |       |       |    |      |       |       |       |       |       | 2020 | 0.4   | 7.0   | -12.5 | -68.4 | -14.2 |
|      |     |      |       |       |    |      |       |       |       |       |       | 2022 | -34.0 | 48.0  | -52.0 | 82.0  | 9.0   |
|      |     |      |       |       |    |      |       |       |       |       |       | 2023 | 48.0  | 59.0  | -60.0 | -42.0 | 1.0   |
|      |     |      |       |       |    |      |       |       |       |       |       | 2024 | -47.0 | -42.0 | 26.0  | 37.0  | -5.0  |

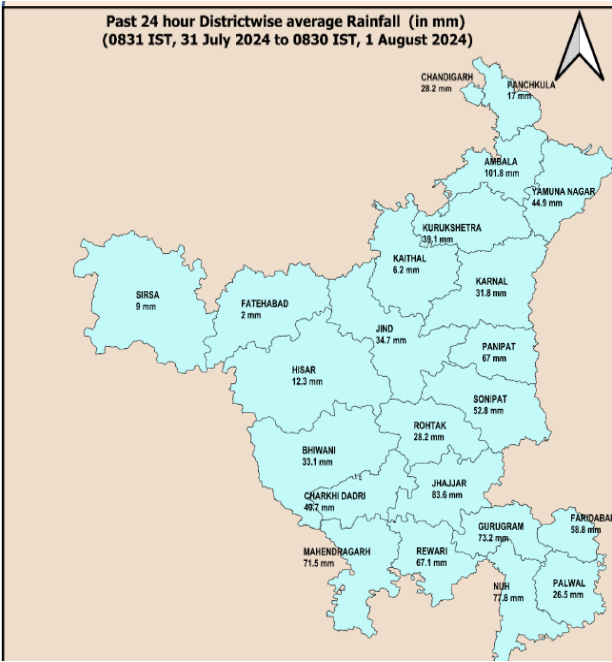
1. EVENT OF 31<sup>ST</sup> JULY TO 01<sup>ST</sup> AUGUST

SYNOPTIC FEATURES:

Monsoon trough at mean sea level moved northward and intensified during 31 July to 01st August 2024 and then move southward during 01st to 02nd August 2024. Also during this period there was large moisture flux from the Arabian sea

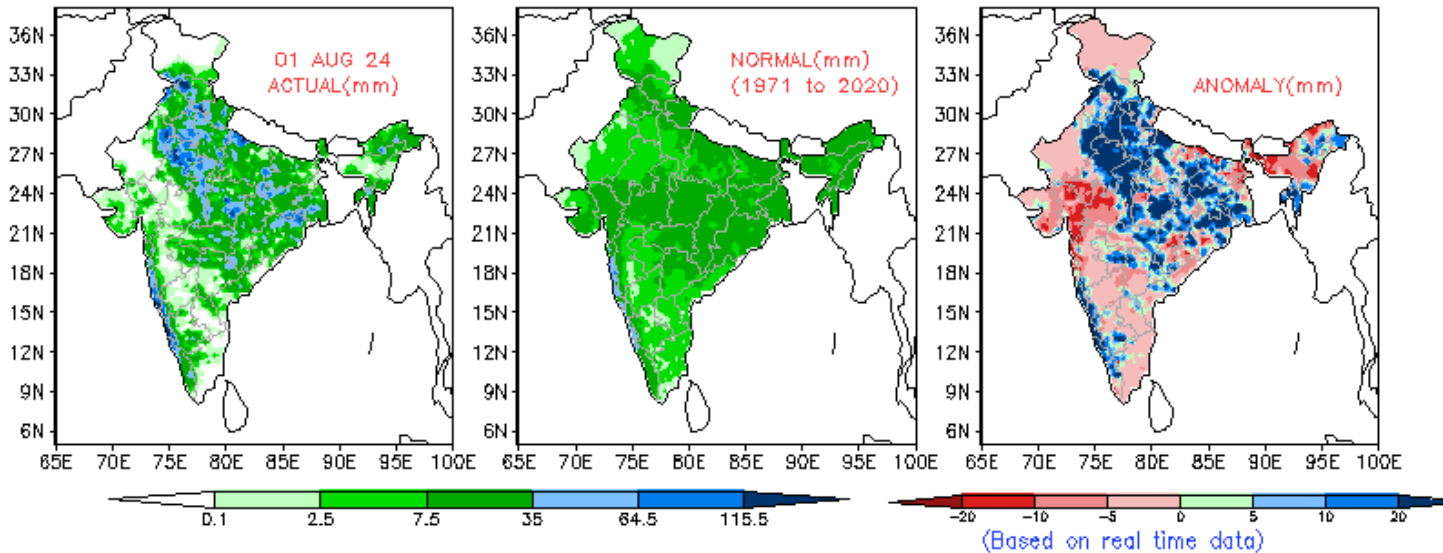
HEAVY RAINFALL EVENTS

| DISTRICT WISE HEAVY RAINFALL EVENTS IN 1 <sup>st</sup> AUGUST 2024 IN HARYANA |              |         |                 |
|---|--------------|---------|-----------------|
| DATE  | DISTRICT     | STATION | RAINFALL(in cm) |
| 08/01/2024  | Ambala Cantt | Ambala  | 18              |
| 08/01/2024  | Ambala       | Ambala  | 14              |
| 08/01/2024  | Mulana       | Ambala  | 13              |
| 08/01/2024  | Nahar Rev    | Rewari  | 13              |
| 08/01/2024  | Kosli        | Rewari  | 13              |
| 08/01/2024  | Gurgaon Aws  | Gurgaon | 12              |
| 08/01/2024  | Ambala Rev   | Ambala  | 11              |
| 08/01/2024  | Jhirka       | Nuh     | 11              |
| 08/01/2024  | Sahlawas     | Jhajjar | 11              |
| 08/01/2024  | Gurgaon Rev  | Gurgaon | 11              |
| 08/01/2024  | Palhawas Rev | Rewari  | 10              |
| 08/01/2024  | Madluda Rev  | Panipat | 10              |



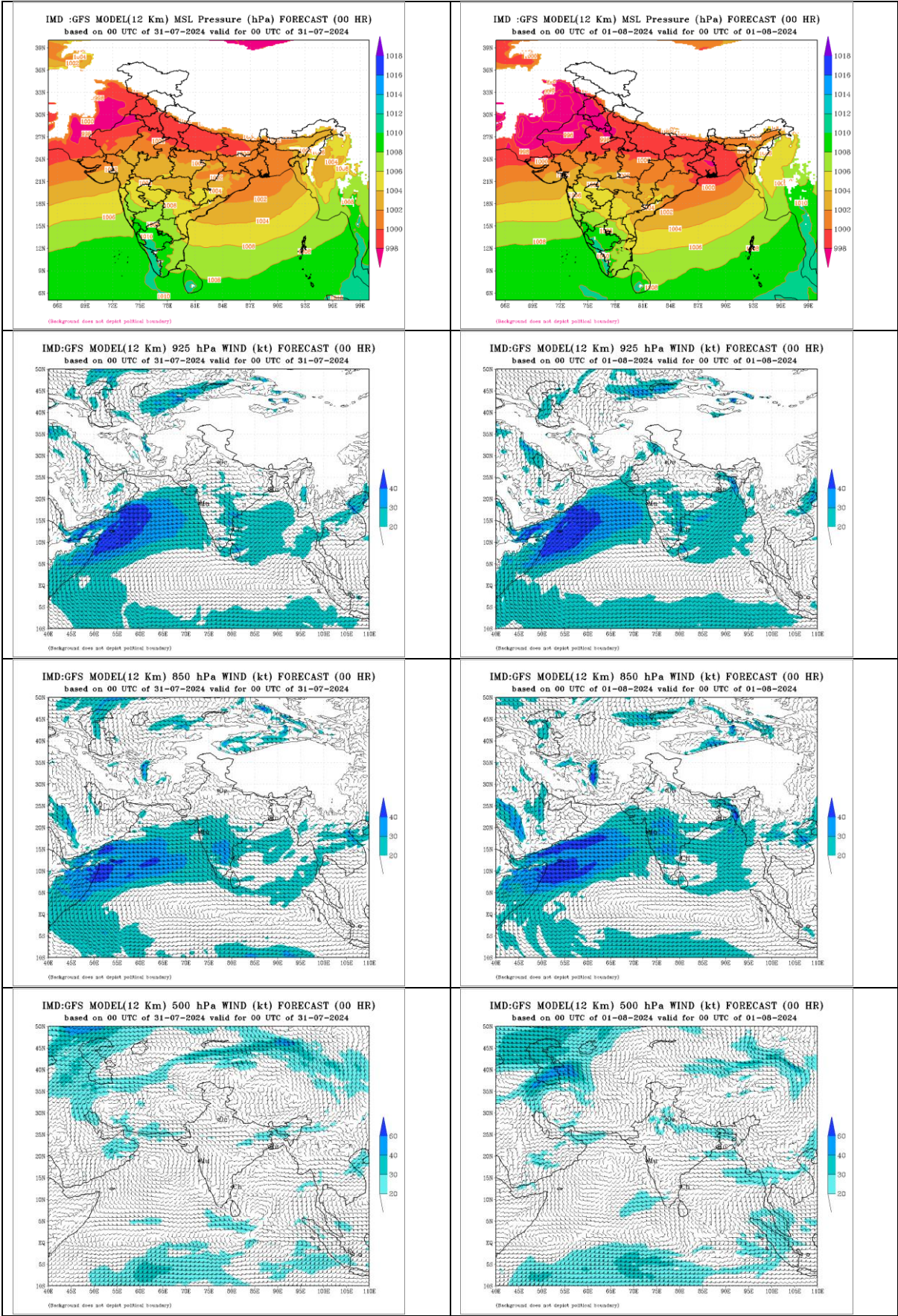
CLIMATE MONITORING AND PREDICTION GROUP

Past 24 hours Rainfall Recorded at 0830 hrs IST on 01 AUG 24



MODEL ANALYSIS

GFS Analysis Charts showing the northward movement and organization of Monsoon trough during 31<sup>st</sup> July to 1<sup>st</sup> August 2024. Also, during same time moisture flux associated with somalin jet was high.

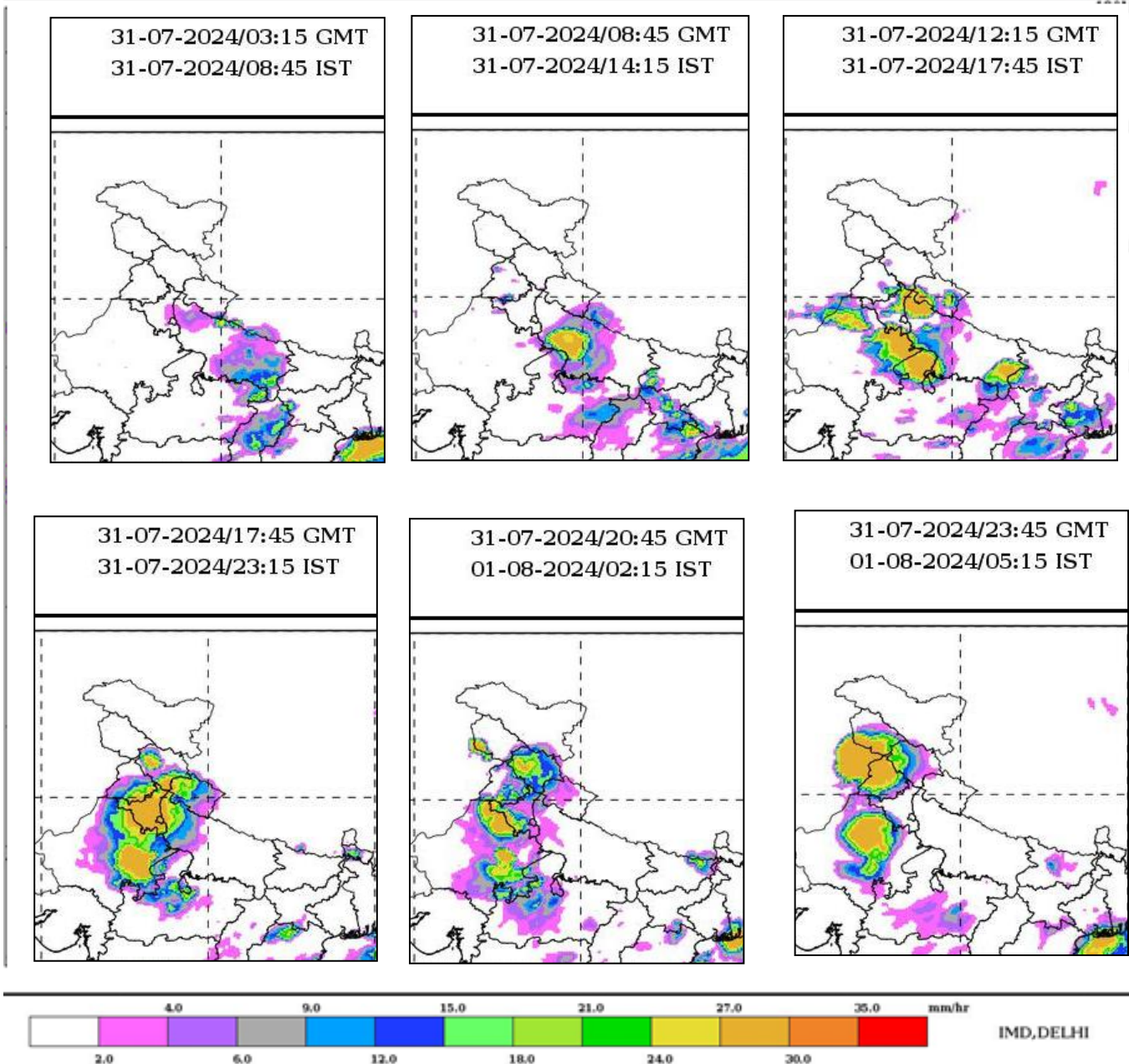




## SATELLITE ANALYSIS

As seen in the satellite imagery Convective cloud mass started developing over western Uttar Pradesh around 0300 UTC of 31<sup>st</sup> July 2024 this cloud mass gradually shifted westwards towards South Eastern and northern parts of Haryana and Adjoining West Uttar Pradesh by 1215UTC. Also, a convective cloud mass also started developing over western parts of Haryana (Sirsa, Fatehabad, Hisar Districts and Adjoining in areas) around 0700UTC of 31<sup>st</sup> July and was fully organized by 1215UTC. Convection continued to develop and both the cloud masses merged around 1745UTC causing maximum intensity. Then complete cloud mass shifted westward towards Punjab and Rajasthan by 2345UTC

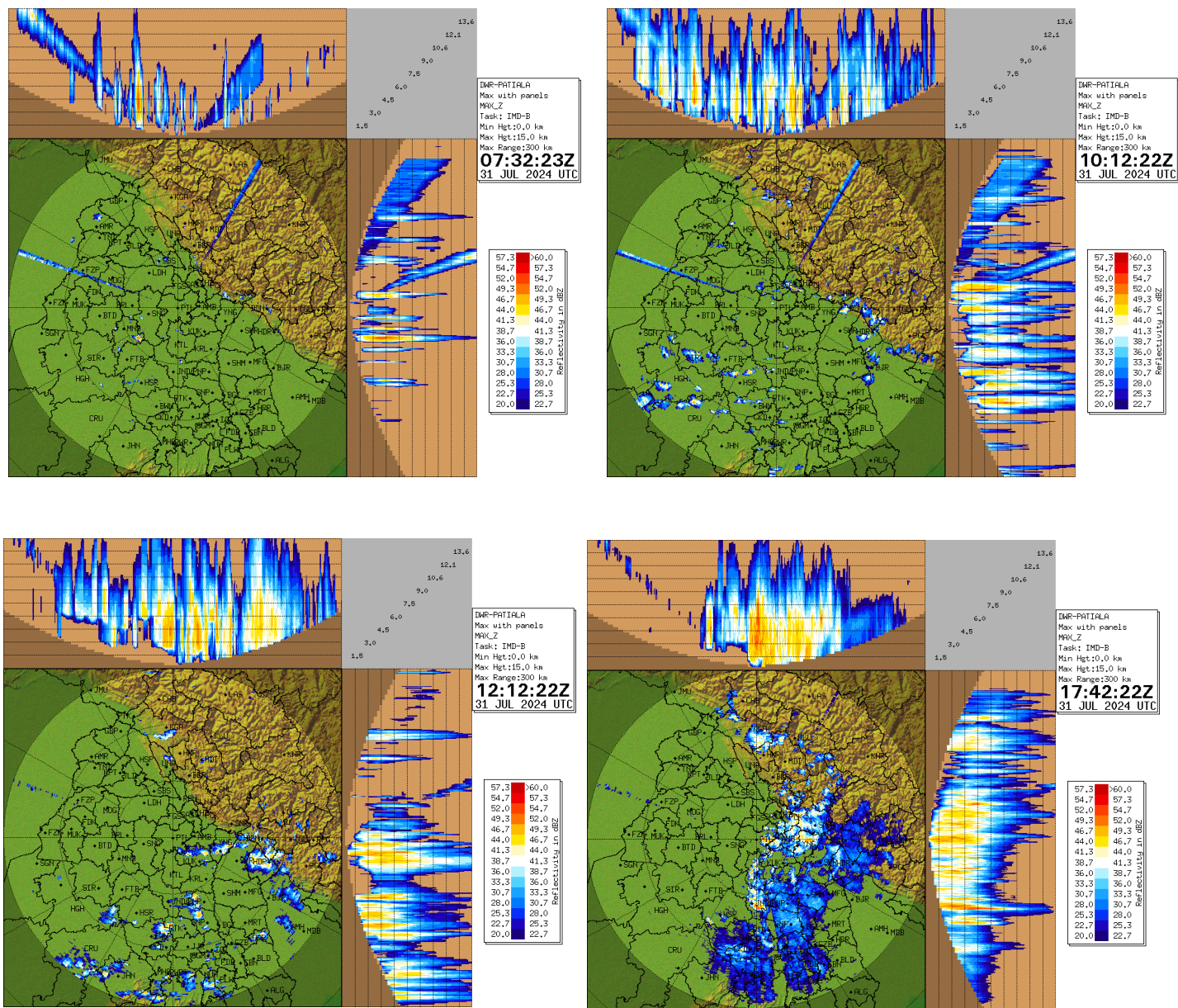
SAT : INSAT-3DR IMG  
INSAT Multispectral Rainfall  
L2G GEOPHYSICAL PARAMETER GRIDDED





**Radar Analysis:**

In Radar Imagery also convention pattern was similar to what was observed in Satellite imagery. Convection was maximum in intensity and distribution around 1742UTC of 31<sup>st</sup> July 2024 with maximum cloud height reaching up to 12 km.



दिनांक :31-07-2024

जारी करने का समय :1300

भा.स.मा.

## मौसम चेतावनी हरियाणा

मौसम चेतावनी बुलेटिनसंख्या .FS(W)/31/जुलाई 2024

Note: Forecast/Warning for any day is valid from 0830 hours IST of that day till 0830 hours IST of next day

| क्षेत्र     | ज़िले                      | 31-07-24  | 01-08-24  | 02-08-24                 | 03-08-24 | 04-08-24 |
|-------------|----------------------------|---|---|--------------------------|----------|----------|
|             |                            | चेतावनी   | चेतावनी   | चेतावनी                  | चेतावनी  | चेतावनी  |
| उत्तर/NORTH | चंडीगढ़<br>CHANDIGARH      | भारी वर्षा<br>HEAVY RAIN                                  | भारी वर्षा<br>HEAVY RAIN                                  | NIL                      | NIL      | NIL      |
|             | पंचकुला<br>PANCHKULA       | भारी वर्षा<br>HEAVY RAIN                                  | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | भारी वर्षा<br>HEAVY RAIN | NIL      | NIL      |
|             | अंबाला<br>AMBALA           | भारी वर्षा<br>HEAVY RAIN                                  | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | NIL                      | NIL      | NIL      |
|             | यमुनानगर<br>YAMUNANAGAR    | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | भारी वर्षा<br>HEAVY RAIN | NIL      | NIL      |
|             | कुरुक्षेत्र<br>KURUKSHETRA | भारी वर्षा<br>HEAVY RAIN                                  | भारी वर्षा<br>HEAVY RAIN                                  | NIL                      | NIL      | NIL      |
|             | कैथल KAITHAL               | भारी वर्षा<br>HEAVY RAIN                                  | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | NIL                      | NIL      | NIL      |
|             | करनाल KARNAL               | भारी से बहुत भारी<br>वर्षा<br>HEAVY TO VERY<br>HEAVY RAIN | भारी वर्षा<br>HEAVY RAIN                                  | NIL                      | NIL      | NIL      |

| क्षेत्र                                    | ज़िले                    | 31-07-24   | 01-08-24   | 02-08-24 | 03-08-24 | 04-08-24 |
|--|--------------------------|--|--|----------|----------|----------|
|  |                          | चेतावनी  | चेतावनी  | चेतावनी  | चेतावनी  | चेतावनी  |
| दक्षिण और दक्षिण पूर्व /SOUTH & SOUTH EAST | महेन्द्रगढ़ MAHENDERGARH | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | रेवाड़ी REWARI           | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | झज्जर JHAJJAR            | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | गुरुग्राम GURUGRAM       | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | मेवात MEWAT              | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | पलवल PALWAL              | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | फ़रीदाबाद FARIDABAD      | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | रोहतक ROHTAK             | भारीवर्षा<br>HEAVY RAIN                            | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | सोनीपत SONIPAT           | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | NIL      | NIL      | NIL      |
|  | पानीपत PANIPAT           | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | NIL      | NIL      | NIL      |

| क्षेत्र                                    | ज़िले                   | 31-07-24   | 01-08-24   | 02-08-24 | 03-08-24 | 04-08-24 |
|--|-------------------------|--|--|----------|----------|----------|
|  |                         | चेतावनी  | चेतावनी  | चेतावनी  | चेतावनी  | चेतावनी  |
| पश्चिम और दक्षिण पश्चिम /WEST & SOUTH WEST | सिरसा<br>SIRSA          | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | फ़तेहाबाद FATEHABAD     | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | हिसार<br>HISAR          | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | जींद<br>JIND            | भारीवर्षा<br>HEAVY RAIN                            | भारी सेबहुत भारी वर्षा<br>HEAVY TO VERY HEAVY RAIN | NIL      | NIL      | NIL      |
|  | भिवानी BHIWANI          | भारीवर्षा<br>HEAVY RAIN                            | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |
|  | चरखीदादरी CHARKHI DADRI | भारीवर्षा<br>HEAVY RAIN                            | भारीवर्षा<br>HEAVY RAIN                            | NIL      | NIL      | NIL      |

मौसम विज्ञान केंद्र, चंडीगढ़





प्रेसविज्ञप्ति  
PRESS RELEASE

दिनांक: 31.07.2024

जारी करने का समय: 1600भा.स.मा.

**विषय: पंजाब, हरियाणा और चंडीगढ़ में 31 जुलाई से 1 अगस्त 2024 के दौरान वर्षा गतिविधि में वृद्धि के संबंध में।**

**Subject: Regarding increase in rainfall activity over Punjab, Haryana and Chandigarh during 31<sup>st</sup> July to 1<sup>st</sup> August 2024.**

मौसम पूर्वानुमान और चेतावनी

- पंजाब और हरियाणा सहित चंडीगढ़ में 31 जुलाई से 1 अगस्त 2024 को अधिकांश स्थानों पर हल्की से मध्यम वर्षा होने की संभावना है।
- पंजाब और हरियाणा सहित चंडीगढ़ में 2 अगस्त से 3 अगस्त 2024 के दौरान कुछ स्थानों पर हल्की से मध्यम वर्षा होने की संभावना है।
- उपरोक्त के प्रभाव में हरियाणा, चंडीगढ़ और पंजाब में इस अवधि के दौरान कुछ स्थानों पर गरजचमक की संभावना है।
- 31 जुलाई से 1 अगस्त 2024 को चंडीगढ़ व आसपास के क्षेत्रों में मध्यम से भारी वर्षा होने की संभावना है।
- पंजाब और हरियाणा में 31 जुलाई से 1 अगस्त को कुछ स्थानों पर भारी से अति भारी वर्षा हो सकती है। 2 अगस्त से पंजाब और हरियाणा में कुछ स्थानों पर भारी बारिश होने की संभावना है।
- इस संबंध में अपडेट समय समय पर जारी किये जायेंगे।
- कृपया इस संबंध में जारी किए गए विस्तृत जिलावार पूर्वानुमान और चेतावनियों को देखें। पंजाब और हरियाणा के लिए दिन 7-वार मौसम की चेतावनियाँ अनुबंध-में दी गई हैं।

Weather Forecast and Warning –

- Light to moderate rain likely at most places on 31<sup>st</sup> July and 01<sup>st</sup> August over Punjab and Haryana including Chandigarh.
- Light to moderate rain likely at few places over both states including Chandigarh during 02<sup>nd</sup> August to 03<sup>rd</sup> August 2024.
- Thunderstorm/Lightning likely at isolated places over Punjab, Haryana and Chandigarh during the Period.
- Moderate to Heavy rain at isolated over Chandigarh and adjoining areas on 31<sup>st</sup> July to 01<sup>st</sup> August 2024.
- Heavy to Very Heavy rainfall likely at isolated places on 31<sup>st</sup> July to 01<sup>st</sup> August 2024 over Punjab and Haryana. Heavy Rainfall also likely at isolated places during 2<sup>nd</sup> August over both states
- Kindly Refer to Detailed District-wise forecast and warnings issued in this regard. Day wise weather warnings are given in Annexure-1 for Punjab and Haryana.

**EXPECTED IMPACTS AND SUGGESTED MEASURES FOR HEAVEY TO VERY HEAVY RAIN****(During 31<sup>st</sup> July to 01 August 2024 over Parts of Punjab and Haryana)**

| Alert              | HEAVY RAIN TO VERY HEAVY RAIN   |
|--------------------|---|
| Expected Impacts   | <ul style="list-style-type: none"><li>• <b>Damage to harvested crops lying in open.</b></li><li>• <b>Water logging of low-lying areas.</b></li><li>• <b>Rise of water level in Rivers and seasonal streams</b></li><li>• <b>Closures of some underpasses.</b></li><li>• <b>Damage to Weak structures.</b></li><li>• Short term Disruptions of Municipal services (Water, Electricity etc)</li><li>• Traffic congestion due to water logging, slippery roads and low visibility may lead to increased travel time.</li></ul>   |
| Suggested Measures | <ul style="list-style-type: none"><li>• <b>Don't keep harvested crop in open.</b></li><li>• Avoid venturing into water logged areas.</li><li>• Don't stand near weak structures.</li><li>• Avoid application of Fertilizers and Pesticides.</li><li>• Drive carefully during rain.</li><li>• Don't take shelter under trees.</li><li>• Don't go near water bodies</li><li>• Avoid taking shelter in weak structures during thunderstorm.</li></ul> <b>During a Thunderstorm event</b> <ul style="list-style-type: none"><li>• <b>Take safe shelters; do not take shelter under trees.</b></li><li>• <b>Unplug electrical/ electronic appliances.</b></li><li>• <b>Immediately get out of water bodies.</b></li><li>• <b>Keep away from all the objects that conduct electricity.</b></li><li>• <b>Farming operations may be suspended during the event.</b></li></ul> |

**EXPECTED IMPACTS AND SUGGESTED MEASURES FOR HEAVY RAINFALL AND THUNDERSTORM/LIGHTNING****(During 31<sup>st</sup> July to 02<sup>nd</sup> August 2024 over parts of Punjab, Haryana and Chandigarh)**

| Heavy Rainfall and Thunderstorm/Lightning   |  |
|---|--|
| Expected impacts  | Suggested measures   |
| <ul style="list-style-type: none"><li>• <b>Damage to harvested crops lying in open.</b></li><li>• Water logging of low lying areas.</li><li>• Short term Disruptions of Municipal services (Water, Electricity etc)</li><li>• Traffic congestion due to water logging, slippery roads and low visibility may lead to increased travel time.</li></ul> | <ul style="list-style-type: none"><li>• <b>Don't keep harvested crop in open.</b></li><li>• Avoid venturing into water logged areas.</li><li>• Don't stand near weak structures.</li><li>• Avoid application of Fertilizers and Pesticides.</li><li>• Drive carefully during rain.</li><li>• Don't take shelter under trees.</li><li>• Don't go near water bodies</li><li>• Avoid taking shelter in weak structures during thunderstorm.</li></ul> |

## (Annexure I)

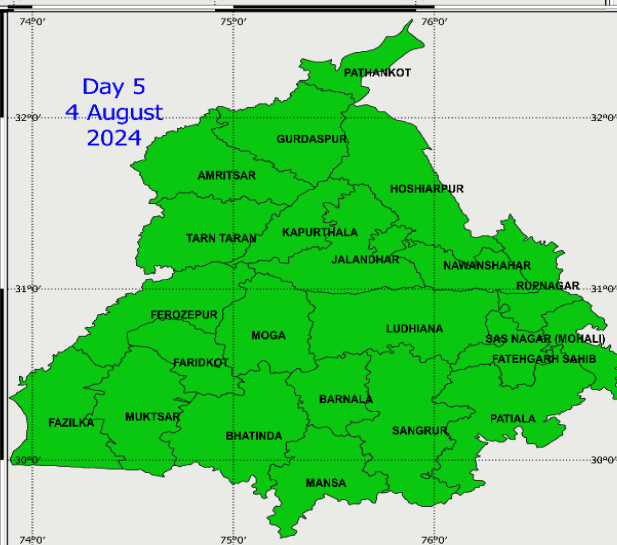
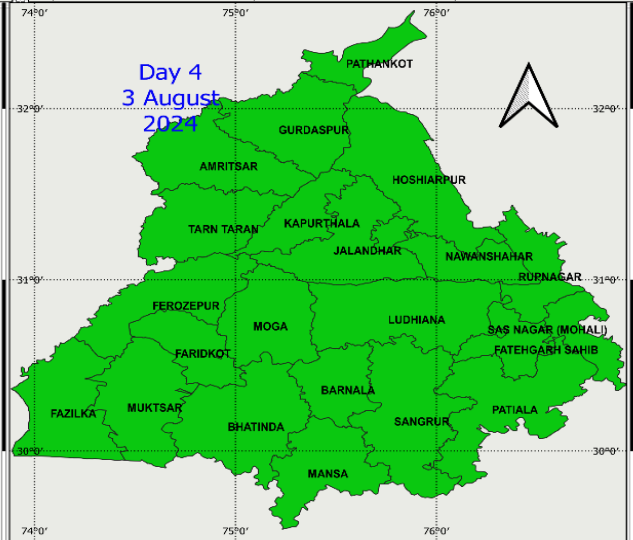
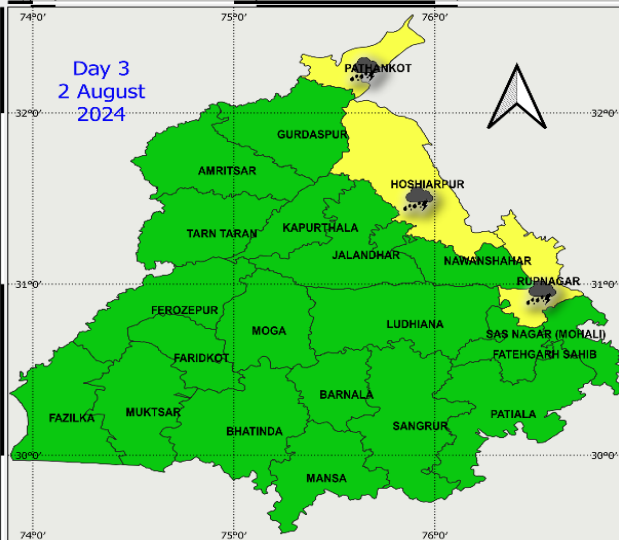
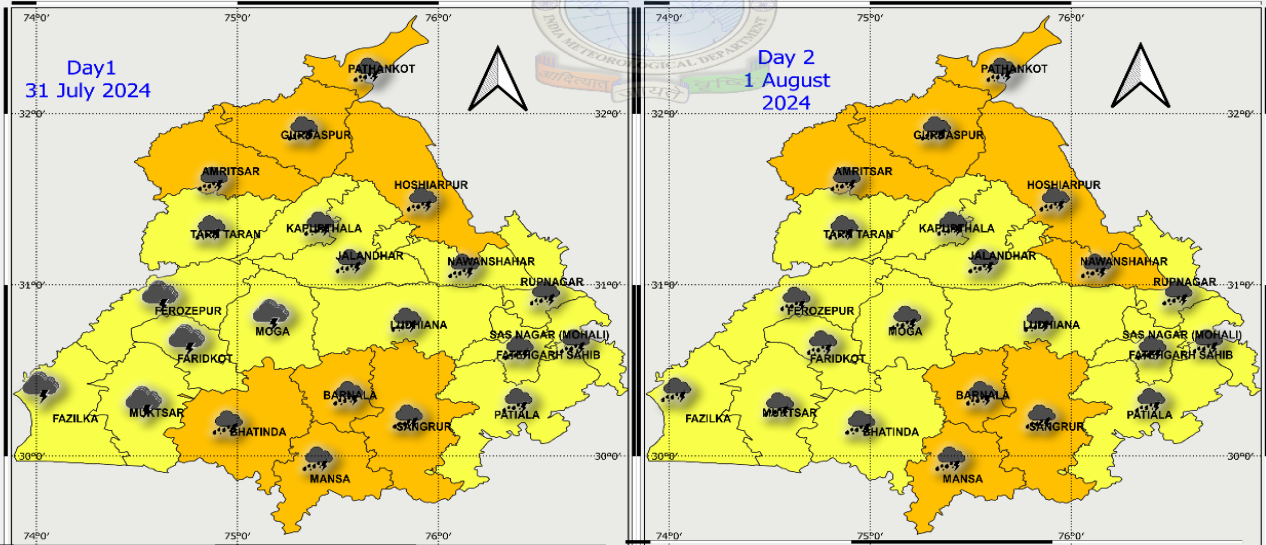
भारत सरकार  
पृथ्वी विज्ञान मंत्रालय  
भारत मौसम विज्ञान विभाग  
मौसम चेष्ट संडीमड

### District wise weather warnings for Punjab Date 31 July 2024

पंजाब के लिए जिलेवार मौसम चेतावनी

Note: Warning for any day is valid from 0830 hours IST of that day till 0830 hours IST of next day  
किन्ती भी दिन की चेतावनी उस दिन के 0830 बजे IST से अगले दिन के 0830 बजे IST तक मान्य है

Government of India  
Ministry of Earth Sciences  
India Meteorological Department  
Meteorological Centre, Chandigarh



#### Legend Phenomenon

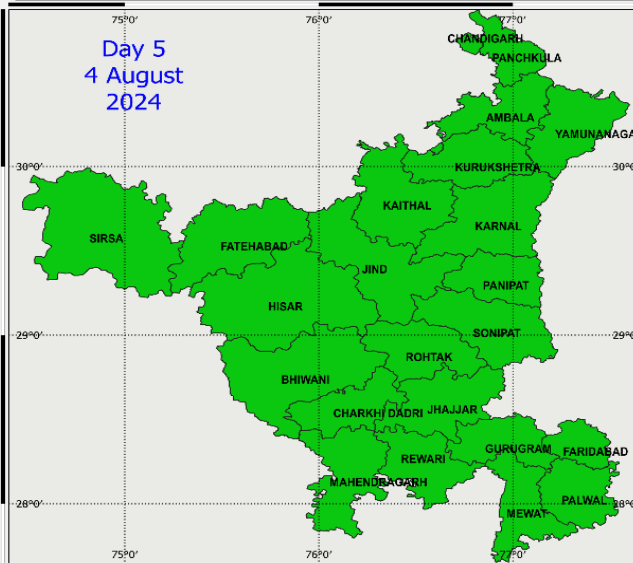
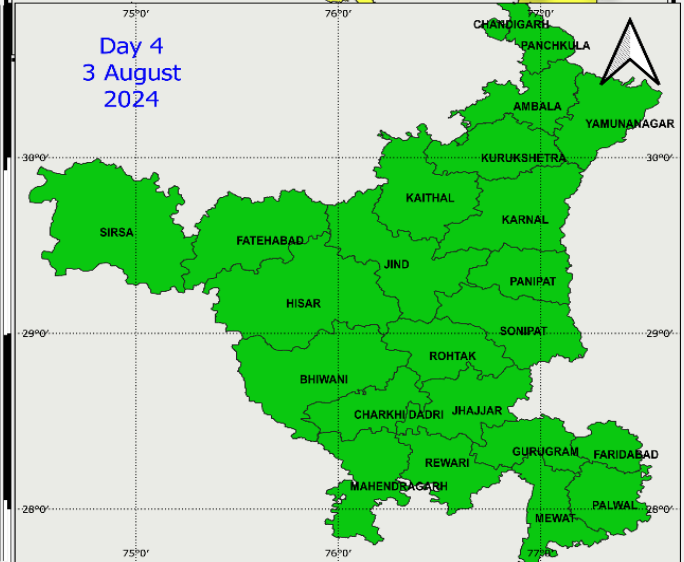
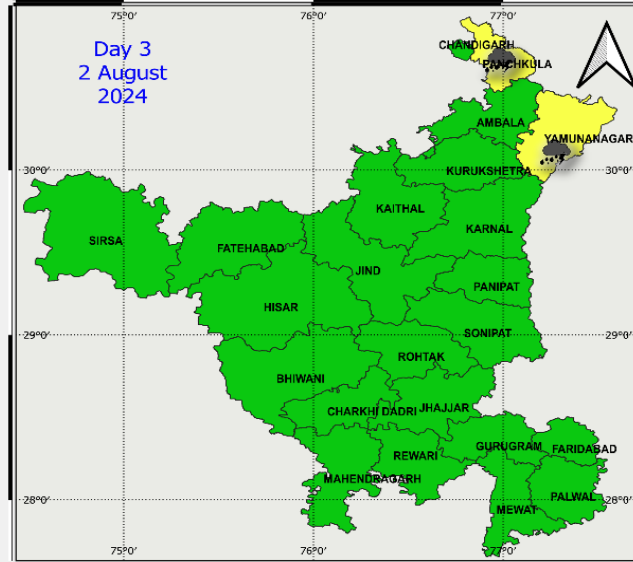
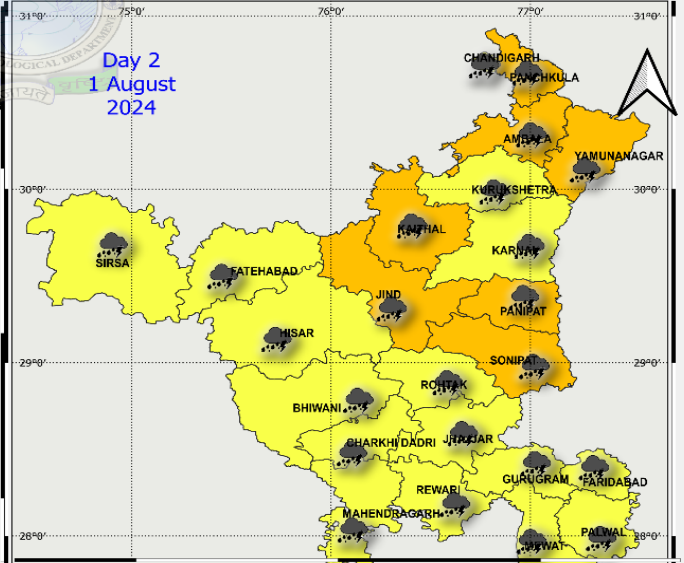
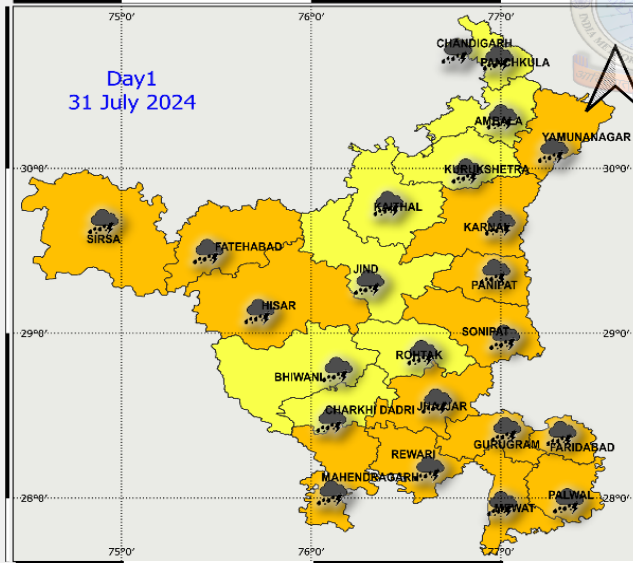
- Heavy rain
- Heavy to very heavy rain
- Thunderstorm/Lightning

Warning Level चेतावनी श्रेणी

|                                |                       |                                |                                       |
|--------------------------------|-----------------------|--------------------------------|---------------------------------------|
| No Warning<br>कोई चेतावनी नहीं | Be Updated<br>निगरानी | Be Prepared<br>सचेत(तैयार रहे) | Take Action<br>चेतावनी(कार्रवाई करें) |
|--------------------------------|-----------------------|--------------------------------|---------------------------------------|




## District wise weather warnings for Haryana Dated 31 July 2024

हड़ियाणा के लिए जिलेवार मौसम चेतावनी  
Note: Warning for any day is valid from 0830 hours IST of that day till 0830 hours IST of next day  
किसी भी दिन की चेतावनी उस दिन के 0830 बजे IST से अगले दिन के 0830 बजे IST तक मान्य है



### Legend

#### Phenomenon

-  Heavy rain
-  Heavy to very heavy rain
-  Thunderstorm/Lightning

### Warning Level चेतावनी श्रेणी

- No Warning कोई चेतावनी नहीं
- Be Updated निगरानी
- Be Prepared सचेत(तैयार रहे)
- Take Action चेतावनी(कार्रवाई करें)

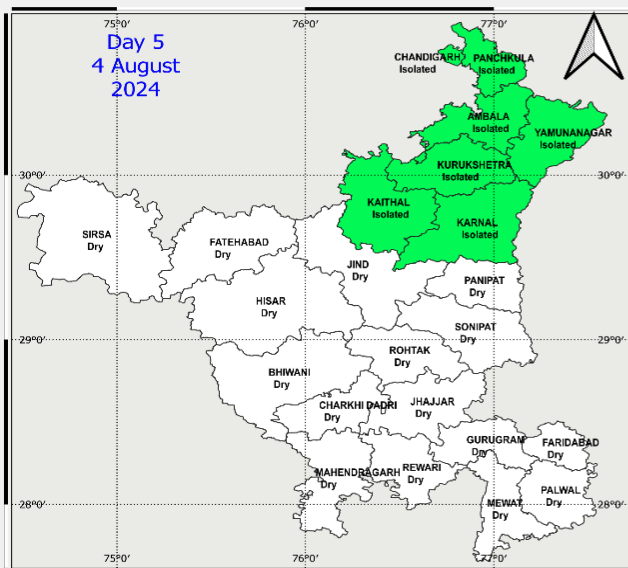
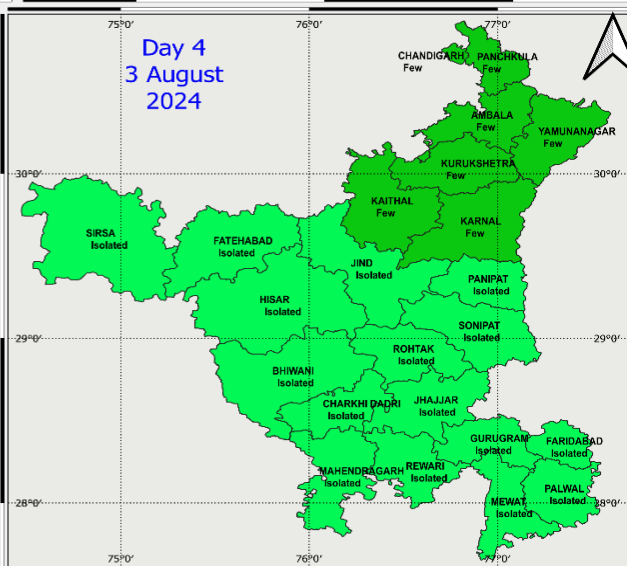
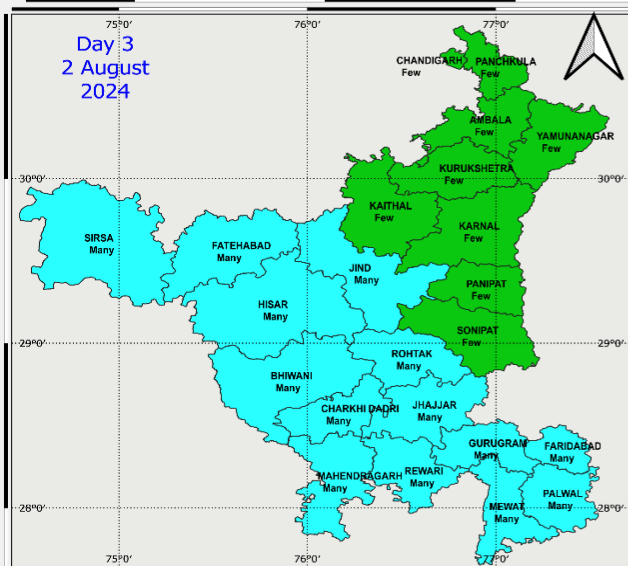
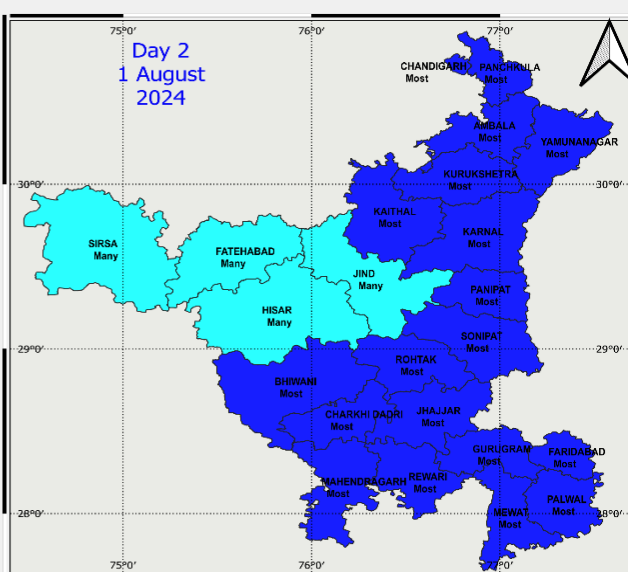
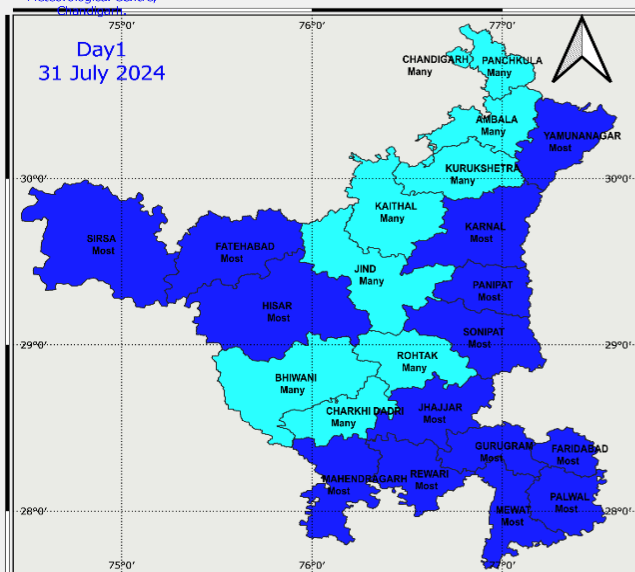




India Meteorological  
Department,  
Meteorological Centre,  
Chandigarh

## District Wise Rainfall Forecast for Haryana Dated 31 July 2024

Note: Forecast for any day is valid from 0830 hours IST of that day till 0830 hours IST of next day



### Legend

Spatial Distribution  
(Percentage of stations reporting rainfall)

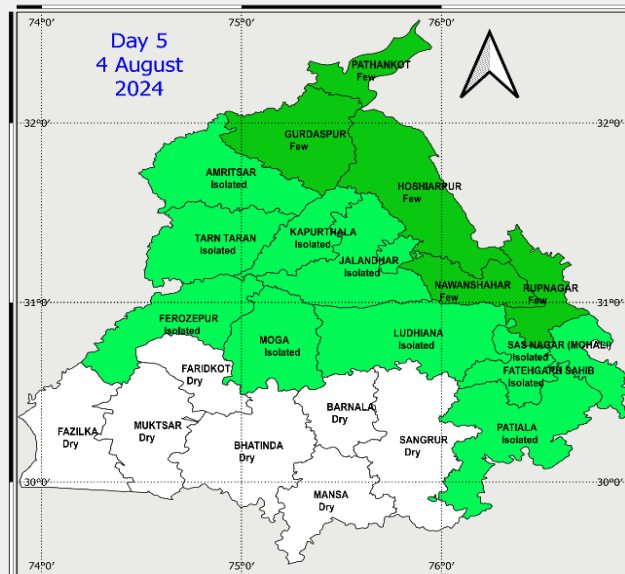
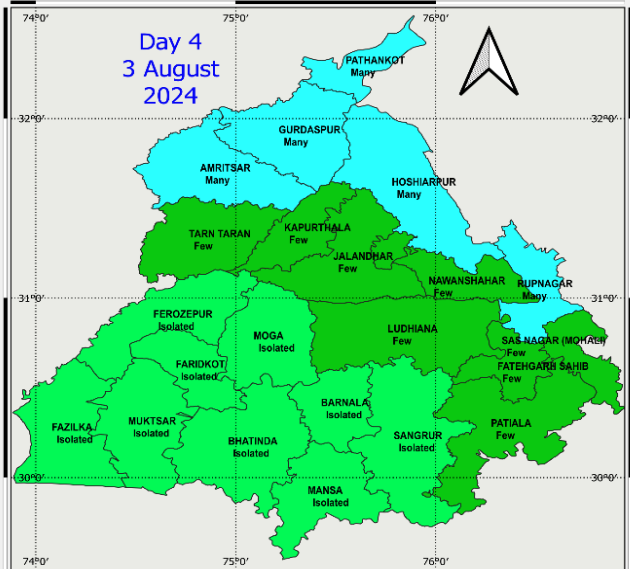
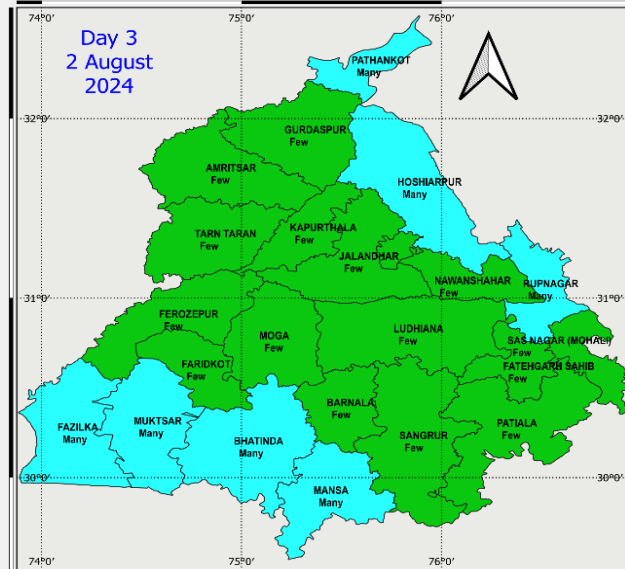
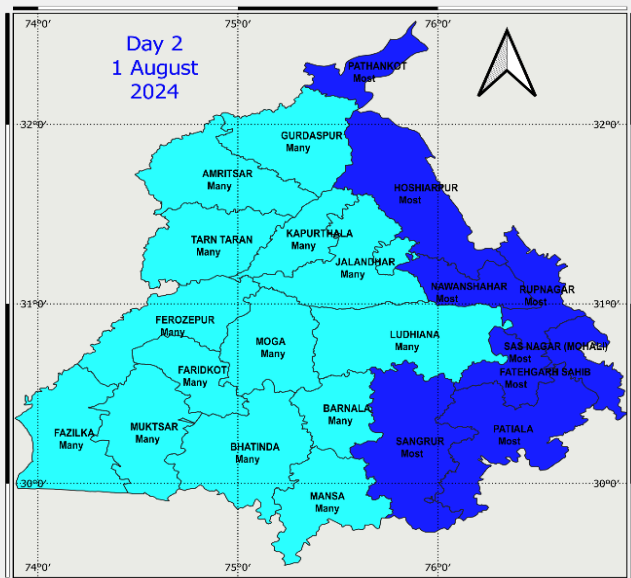
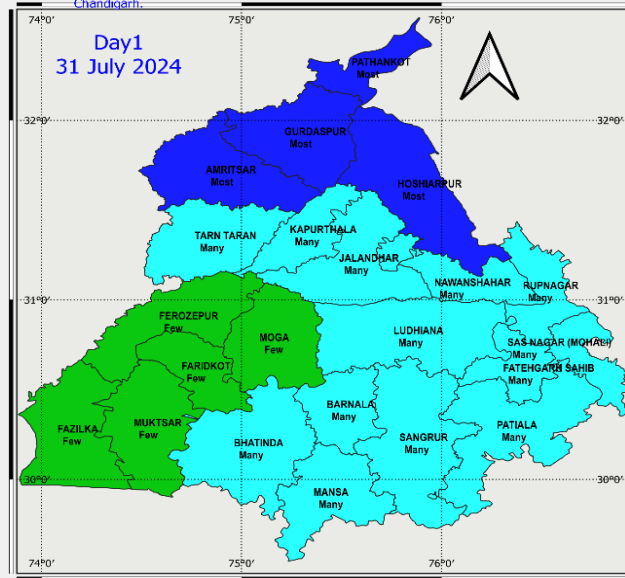
- Dry (No Rain)
- Isolated ( $\leq 25\%$ )
- Few (25-50 %)
- Many (50-75 %)
- Most (75-100%)



India Meteorological  
Department,  
Meteorological Centre,  
Chandigarh

## District Wise Rainfall Forecast for Punjab Dated 31 July 2024

Note: Forecast for any day is valid from 0830 hours IST of that day till 0830 hours IST of next day



### Legend

Spatial Distribution  
(Percentage of stations reporting rainfall)

- Dry (No Rain)
- Isolated ( $\leq 25\%$ )
- Few (25-50 %)
- Many (50-75 %)
- Most (75-100%)

**Haryana 2024 monsoon rainfall was normal.** There were 30 Excess monsoon years ,57 Normal monsoon years and 37 deficient monsoon years during the period 1901-2024.

| Descriptive Term used | % Departure of Realised rainfall from Normal rainfall |
|-----------------------|---|
| Large excess          | +60% or more  |
| Excess                | + 20% to +59%.  |
| Normal                | Between - 19 % to + 19 %.                             |
| Deficient             | Between - 20 % to - 59 %.                             |
| Large deficient       | Between - 60 % to - 99 %.                             |
| No rain               | -100%   |

### Legends

| Rainfall                           |                   |                                     |
|------------------------------------|-------------------|-------------------------------------|
| (Special Distribution of Rainfall) |                   |                                     |
| Distribution                       | No. of Places     | Description                         |
| Isolated                           | One or two Places | <25% of stations gets rainfall      |
| Scattered                          | At a few Places   | (26-50)% of stations gets rainfall  |
| Fairly Widespread                  | At many Places    | (51-75)% of stations gets rainfall  |
| Wide spread                        | At Most place     | (76-100)% of stations gets rainfall |
| Dry                                | -                 | No station reported rainfall        |

| Intensity of Rainfall |                             |
|-----------------------|-----------------------------|
| Descriptive Term used | Rainfall amount in mms      |
| Very Light Rain       | 0.1 - 2.4                   |
| Light Rain            | 2.5 –15.5                   |
| Moderate Rain         | 15.6–64.4                   |
| Heavy Rain            | 64.5 – 115.5                |
| Very Heavy Rain       | 115.6 - 204.4               |
| Extremely Heavy Rain  | Greater or equal to 204.5mm |

| Weekly/Seasonal Rainfall distribution |  |
|---------------------------------------|--|
| (On All India Scale)                  |  |
| Descriptive Term used                 | % Departure of Realised rainfall             |
| Normal                                | Within $\pm 10$ % of the Long Period Average |
| Below Normal                          | < 10% of the Long Period Average             |
| Above Normal                          | > 10% of the Long Period Average             |

| Weekly/Seasonal Rainfall distribution |   |
|---------------------------------------|---|
| (On Regional Scale)                   |   |
| Descriptive Term used                 | % Departure of Realised rainfall from Normal rainfall |
| Large excess                          | +60% or more  |
| Excess                                | + 20% to +59%.  |
| Normal                                | Between - 19 % to + 19 %.                             |
| Deficient                             | Between - 20 % to - 59 %.                             |
| Large deficient                       | Between - 60 % to - 99 %.                             |
| No rain                               | -100%   |

