# Weather Synopsis – January 2024

**1.0 Rainfall distribution over month of January 2024:**

Northeast monsoon conditions were prevailed. Above normal rainfall was reported at almost all the principal meteorological stations except only in the stations located in Katunayake and Mannar where below normal rainfall was reported (Fig 1). Maximum percentage was reported from Kurunegala (**412.1%**) while minimum from Katunayake station ( 71.0 %).

Above normal rainfall was reported from most of the hydro catchment stations except Randenigala and Rantambe where below normal rainfall was reported (Fig 3).

Highest cumulative rainfall was **793.9 mm** at Rufuskulam. Highest rainfall received during 24hours, was 270 mm at Rufuskulam on 6$^{th}$ January.

Mainly dry weather was reported at 13$^{th}$ ,15$^{th}$ 16$^{th}$, 17$^{th}$, 25$^{th}$, 27$^{th}$. Rainfall activity enhanced over the island and extreme rainfall reported from 8$^{th}$ to 11$^{th}$ and also at 2$^{nd}$, 20$^{th}$ and 31$^{st}$ days.

**Table 1**: stations received above 150 mm rainfall during January 2024

| Date | Station | 24-hour Rainfall (mm) |
|---|---|---|
| 10-January 2024 | Pottuvil | 172.1 |
| 18-January 2024 | Mullaitivu | 164.3 |
| 08-January 2024 | Rufuskulam | 270 |
| 09-January 2024 | Rufuskulam | 157.3 |
| 10-January 2024 | Rufuskulam | 201.3 |
| 10-January 2024 | Inginiyagala | 172.2 |
| 10-January 2024 | Pannalgama | 206.6 |
| 06-January 2024 | Negombo | 165 |
| 18-January 2024 | Mullaitivu | 164.3 |

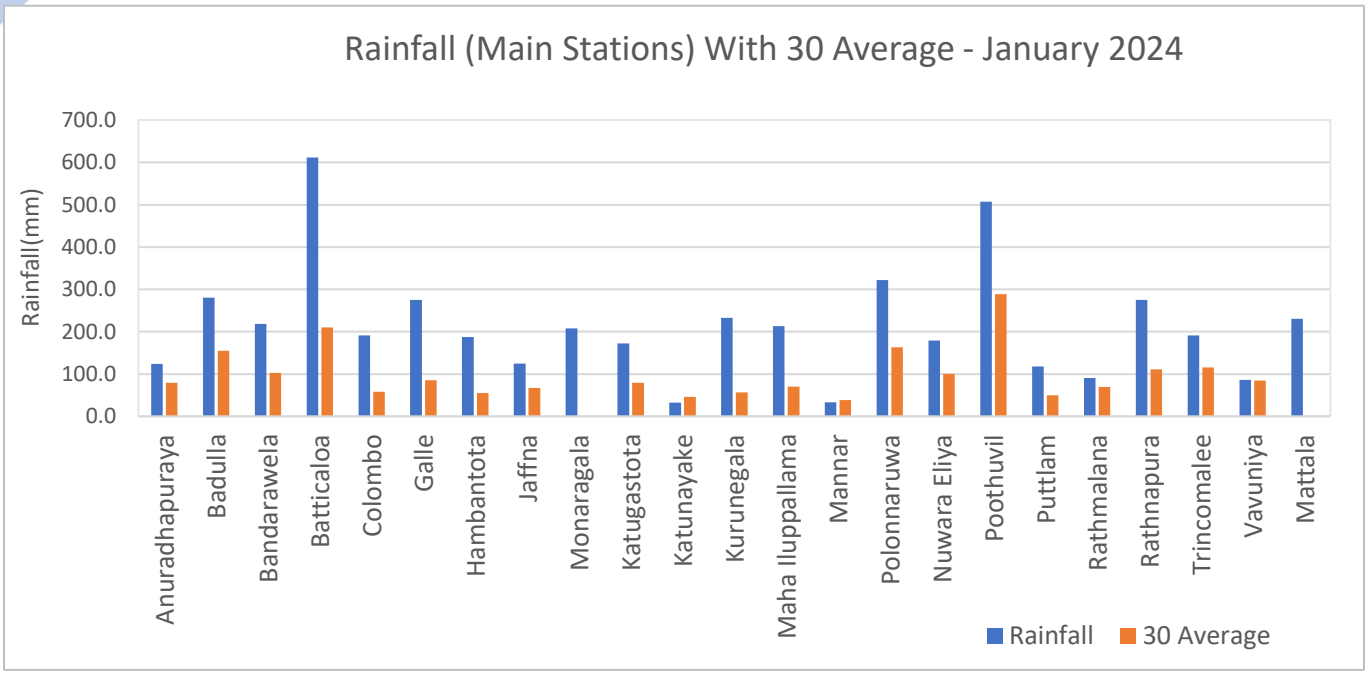


**Fig 1**: Monthly Total Rainfall(mm) with 30 years (1981-2010) of their averages at Main Meteorological stations areas during January2024

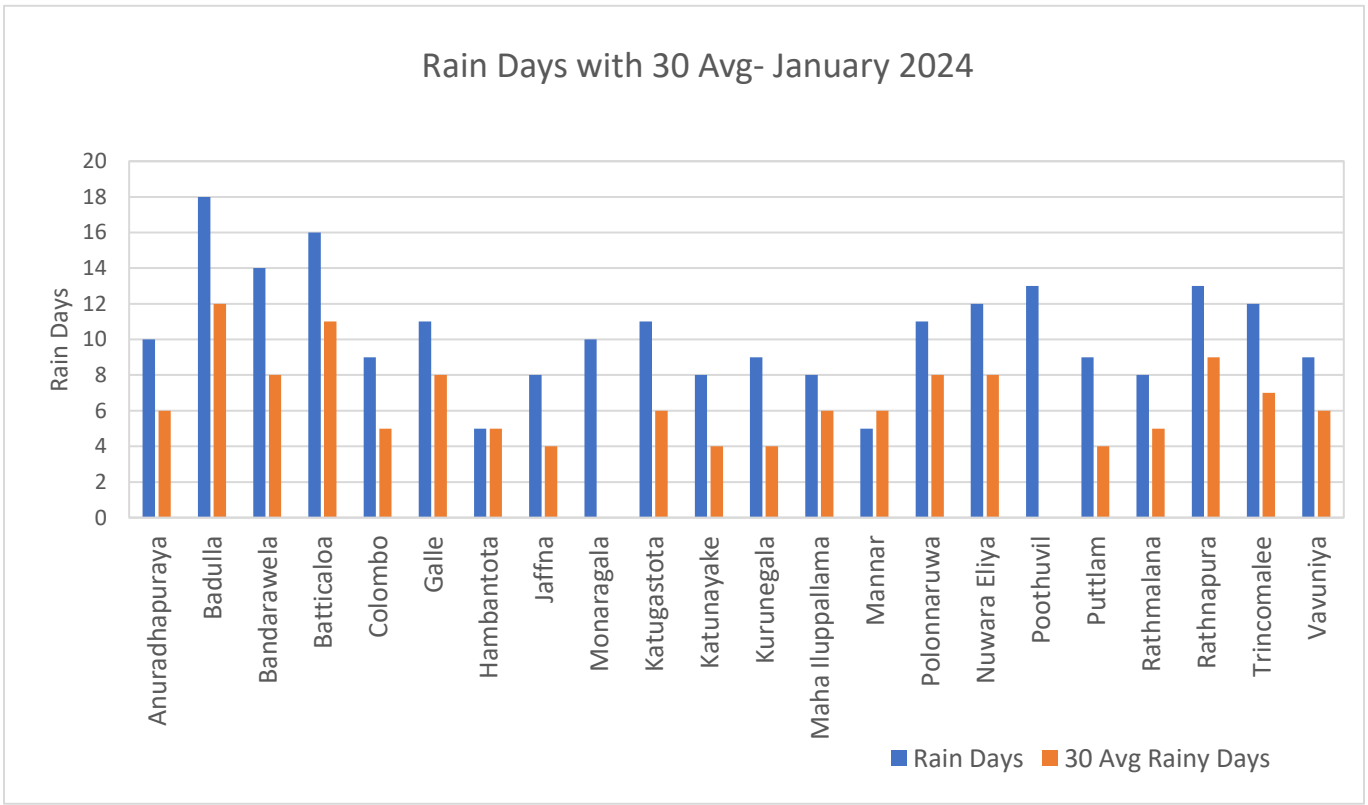


**Fig 2**: monthly total no of rainy days with 30 years (1981-2010) of their averages at main Meteorological stations duringJanuary2024

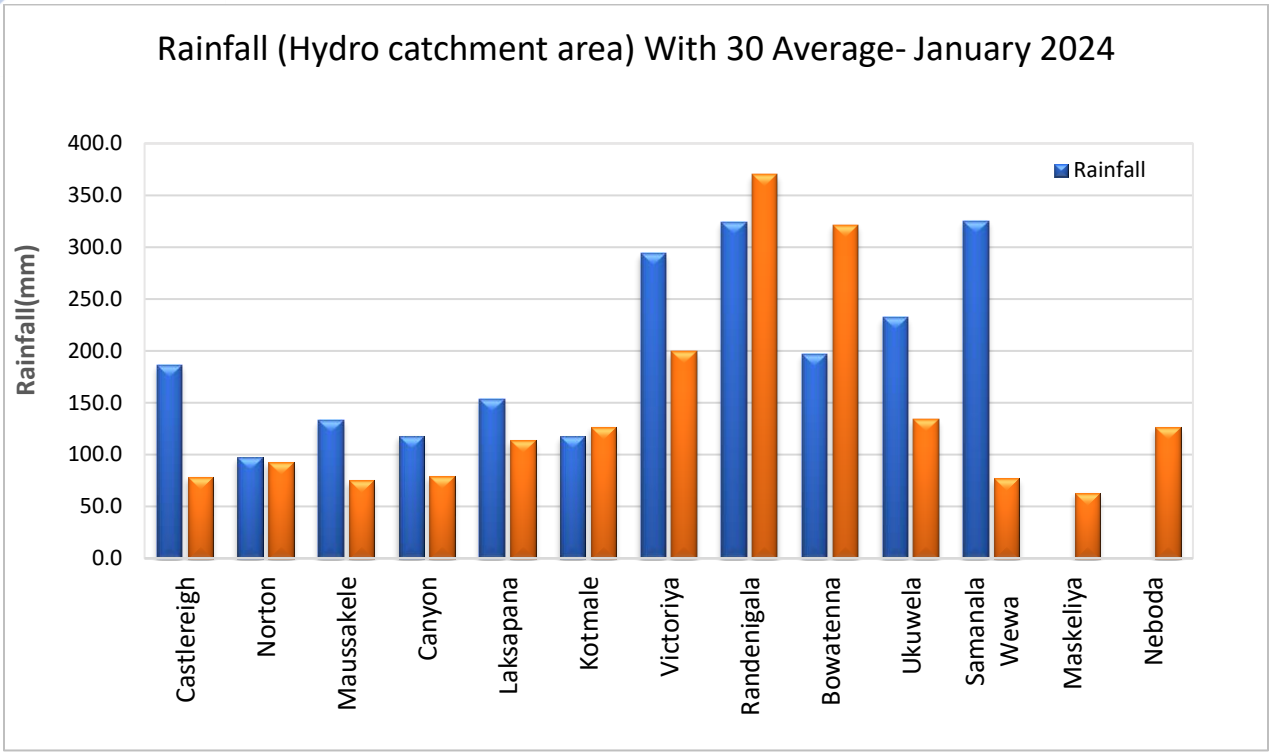


**Fig 3**: Monthly Total Rainfall(mm) with 30 years (1981-2010) of their averages at Hydro catchment areas duringJanuary2023

**Table-02:** Monthly Total Rainfall (mm) with 30 years (1981-2010) of their averages at Hydro catchment areas

| Hydro Catchment | Jan 2024 | Average | % (percentage of average) |
|---|---|---|---|
| Castlereigh | 186.5 | 78.7 | 236.9% |
| Norton | 97.2 | 92.8 | 104.7% |
| Maussakele | 133.0 | 75.5 | 176.2% |
| Canyon | 118.1 | 79.3 | 148.9% |
| Laksapana | 153.7 | 114.0 | 134.8% |
| Kotmale | 117.6 | 126.6 | 92.9% |
| Victoriya | 294.2 | 199.2 | 147.7% |
| Randenigala | 324.3 | 369.7 | 87.7% |
| Bowatenna | 196.9 | 321.3 | 61.3% |
| Ukuwela | 232.3 | 134.1 | 173.3% |
| Samanala Wewa | 325.5 | 76.9 | 423.2% |

**Table-03**: Total rainfall and the number of rainy days at the principal meteorological stations recorded in the month against the respective averages (1981-2010).

| Meteorological station | Monthly Total rainfall(mm) | | | Monthly Total No of rainy Days | | |
|---|---|---|---|---|---|---|
| | 2024-Jan | Average | % | 2024-Jan | Average | % |
| Anuradhapuraya | 124.1 | 79.2 | 156.7% | 11 | 6 | 183.3% |
| Badulla | 280.0 | 155.2 | 180.4% | 18 | 12 | 150.0% |
| Bandarawela | 218.5 | 102.4 | 213.4% | 15 | 8 | 187.5% |
| Batticaloa | 611.8 | 210.3 | 290.9% | 16 | 11 | 145.5% |
| Colombo | 191.1 | 58.2 | 328.4% | 9 | 5 | 180.0% |
| Galle | 275.2 | 85.1 | 323.4% | 12 | 8 | 150.0% |
| Hambantota | 187.7 | 55.1 | 340.7% | 5 | 5 | 100.0% |
| Jaffna | 124.9 | 67.1 | 186.1% | 8 | 4 | 200.0% |
| Monaragala | 207.8 | | | 11 | | |
| Katugastota | 171.9 | 79.4 | 216.5% | 12 | 6 | 200.0% |
| Katunayake | 32.5 | 45.8 | 71.0% | 9 | 4 | 225.0% |
| Kurunegala | 232.4 | 56.4 | 412.1% | 10 | 4 | 250.0% |
| Maha Iluppallama | 213.0 | 69.8 | 305.2% | 10 | 6 | 166.7% |
| Mannar | 33.3 | 38.7 | 86.0% | 7 | 6 | 116.7% |
| Polonnaruwa | 321.8 | 163.5 | 196.8% | 13 | 8 | 162.5% |
| Nuwara Eliya | 178.7 | 100.6 | 177.6% | 14 | 8 | 175.0% |
| Poothuvil | 507.4 | 288.4 | 175.9% | 13 | NA | |
| Puttlam | 117.8 | 50.1 | 235.1% | 10 | 4 | 250.0% |
| Rathmalana | 90.2 | 69.3 | 130.2% | 9 | 5 | 180.0% |
| Rathnapura | 275.0 | 111.1 | 247.5% | 14 | 9 | 155.6% |
| Trincomalee | 191.5 | 115.6 | 165.7% | 13 | 7 | 185.7% |
| Vavuniya | 85.7 | 84.2 | 101.8% | 10 | 6 | 166.7% |
| Mattala | 230.6 | | | 9 | | |

Note that the meteorological day in this text is reckoned as the 24hr period from 08.30hrs to 08.30hrs following day.

**2.0 Lightning:**

Higher Lightning density was reported in Biyagama. Kaduwela, Awissawella, Dehiowita, Bulathsinhala, Ayagama, Elapatha, Nivithigala, Agalawtta, Neluwa, Thawalama, Pitabeddara, Galle, Akmeemana, Habaraduwa, and Weligama areas during month of January (Fig 4).

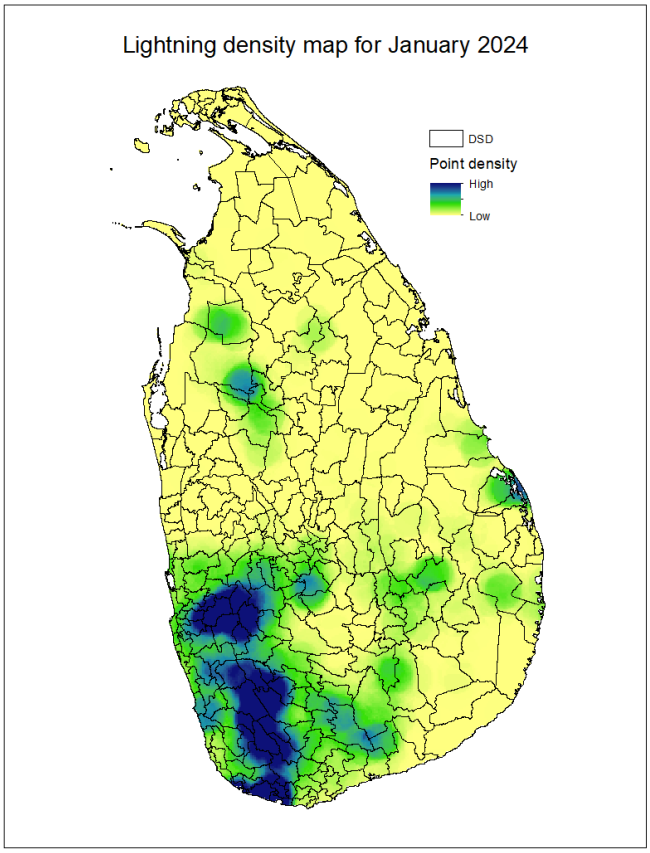


**Fig 4**: Lightning density map for January 2024

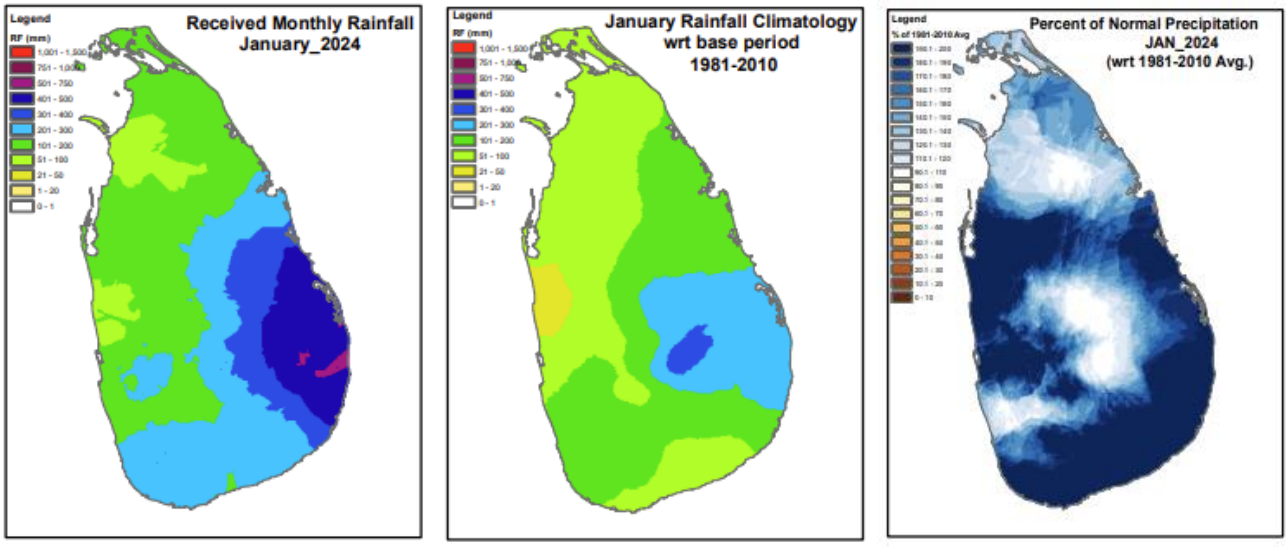


**Fig 5**: Observed rainfall, 30-year climatology and precent of normal (%) rainfall with respect to the (1981-2010) base period for January 2024.

## 3.0 Synoptic Situation:

### 3.1 Surface pressure and winds

The surface pressure was above average except, about normal between 1st, 2nd, 4th, 8th, 11th, 16th, 19th and below normal between 3rd, 6th, 7th, 9th, 10th 17th and 18th. Surface wind over the island was predominantly North easterly or variable in direction with speed of (05-10) knots except variable winds reported from 17th to 19th and northerly or northeasterly wind over 30th.

### 3.2 Upper winds:

**At 850hPa:** Northeasterly wind flow is dominated over the island. (Fig 6). Anomalous northeasterly winds across Sri Lanka indicate strengthening of monsoon flow at 850mb level.

**At 700 hPa:** Northeasterly to Easterly wind flow is dominated over the island. Anomalous northeasterly winds across Sri Lanka indicate strengthening of monsoon flow at 700mb level (Fig 7).

**At 500 hPa:** Easterly wind flow is dominated over the island. Anomalous northeasterly winds across Sri Lanka indicate strengthening of monsoon flow at 500mb level (Fig 8).

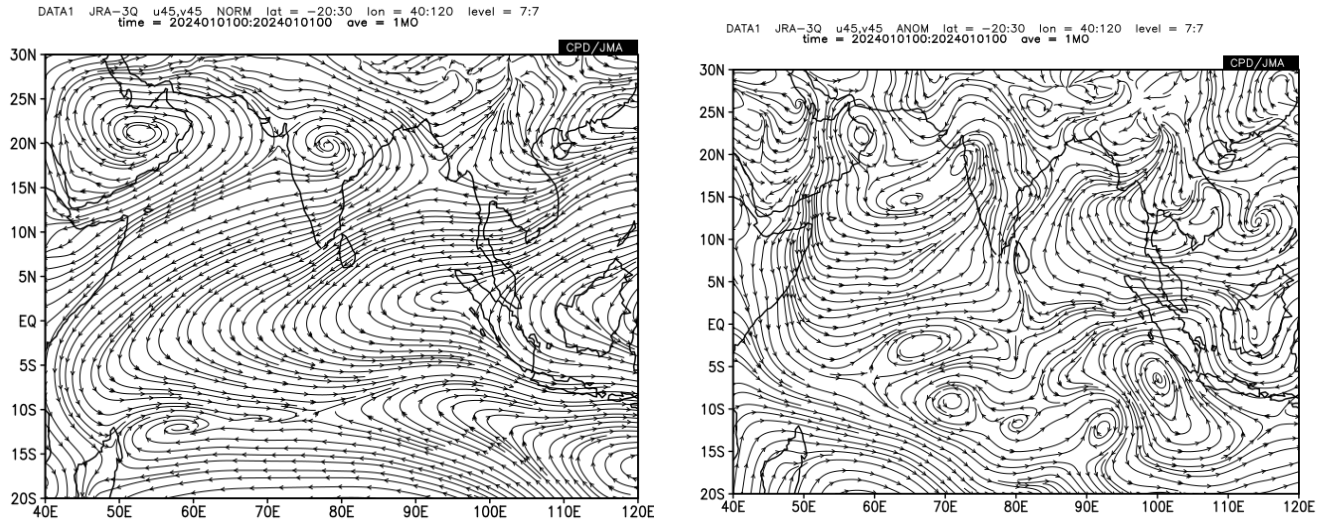


**Fig. 6**: Monthly average wind pattern at 850hap level during the month of January2024 (JRA3Q)

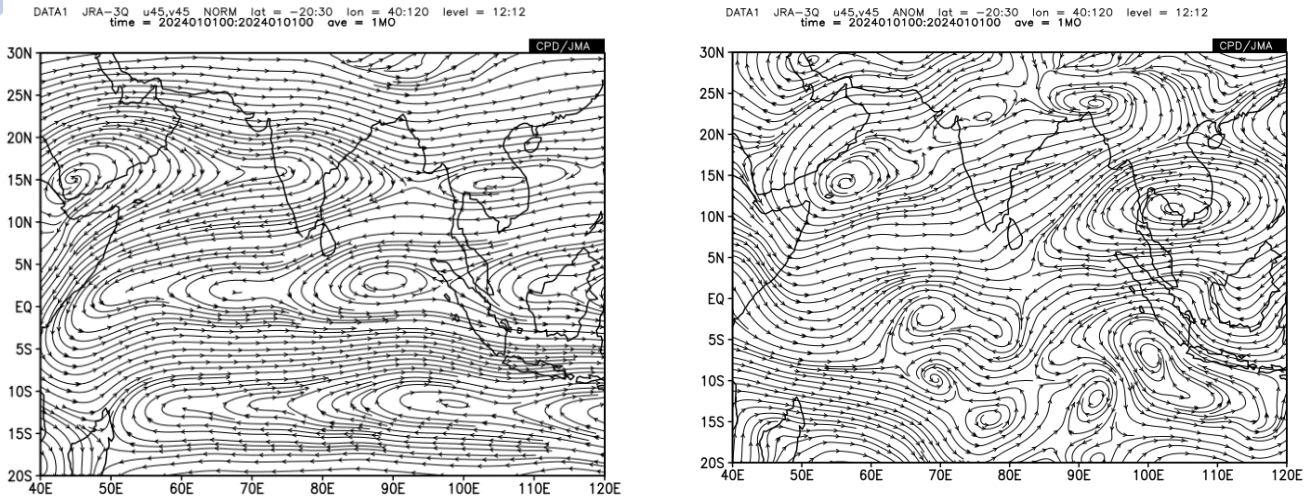


**Fig. 7**: Monthly average wind pattern at 700hpa level during the month of January2023 (JRA3Q)

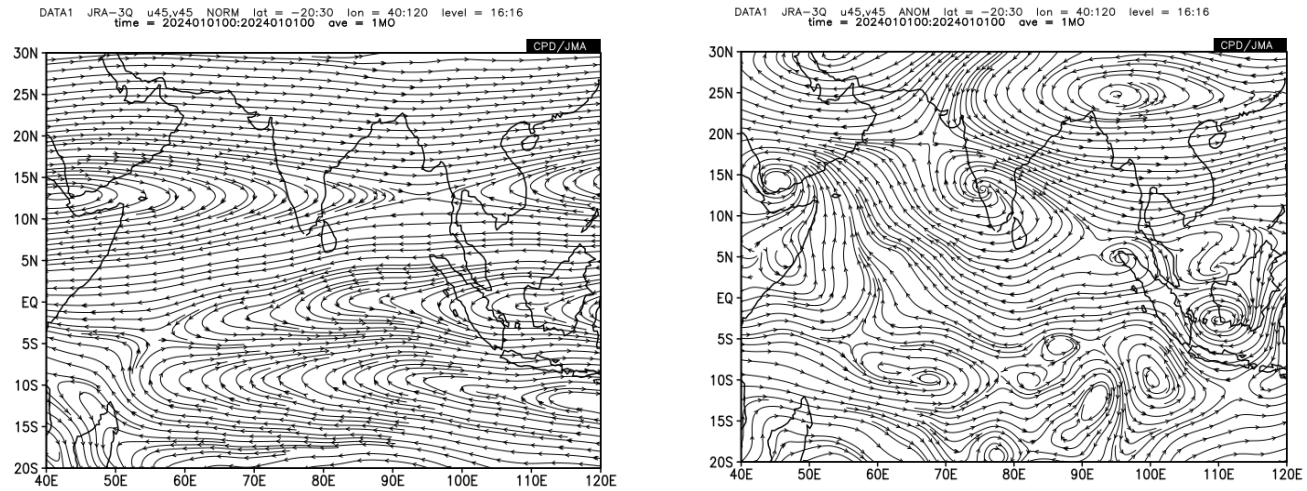


**Fig. 8**: Monthly average wind pattern at 500hpa level during the month of January2024 (JRA3Q)

## 4.0 Temperature Field

The maximum temperatures in the day were mostly above normal in most places. However below normal maximum temperatures were reported at some places from 01st to 2nd, 8th to 10th and on 19th of the month (Fig.9). Minimum temperatures over most parts were above normal except from 15th to 17$^{th}$ and 24$^{th}$ to 26$^{th}$, when below normal night temperatures were reported (Fig 10). Highest recorded maximum temperature for the month of January 2024 was 35.4$^{0}$C at Ratnapura on 03$^{rd}$ and the lowest recorded minimum temperature for the month of January 2024 was 4.4$^{0}$C at Nuwara Eliya on 25$^{th}$ of January 2024 (table 4(a) and 4(b)).

**Table 4(a)**: Extremes of Maximum Temperatures of January 2024

| | Max Temperature | Min offset (-) | Max offset (+) | Highest Std. Div. |
|---|---|---|---|---|
| Value | 35.4$^0$C | 6.9$^0$C | 4.2$^0$C | 5.44 |
| Station | Ratnapura | Ratnapura | Katugastota | Mullaitivu |
| Date | 03/01 | 10/01 | 23/01 | |

**Table 4(b)**: Extremes of Maximum Temperatures of January 2024

| | Min Temperature | Min offset (-) | Max offset (+) | Highest Std. Div. |
|---|---|---|---|---|
| Value | 4.4$^0$C | 5.0$^0$C | 5.7$^0$C | 3.41 |
| Station | Nuwara Eliya | Nuwara Eliya | Vavuniya | Nuwara-Eliya |
| Date | 25/01 | 25/01 | 29/01 | |

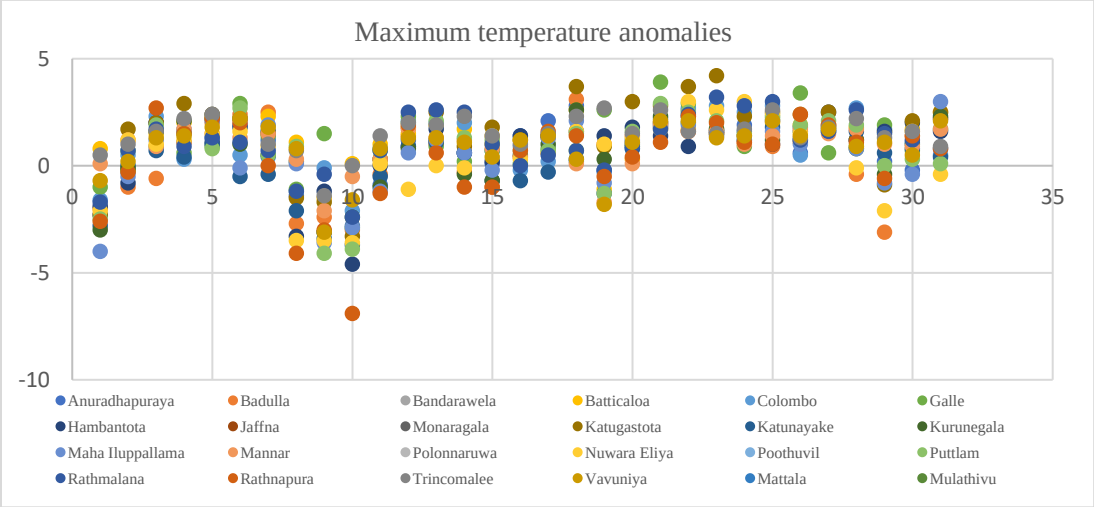


**Fig 9**: Maximum Temperature anomaly ($^0$C) for January 2024

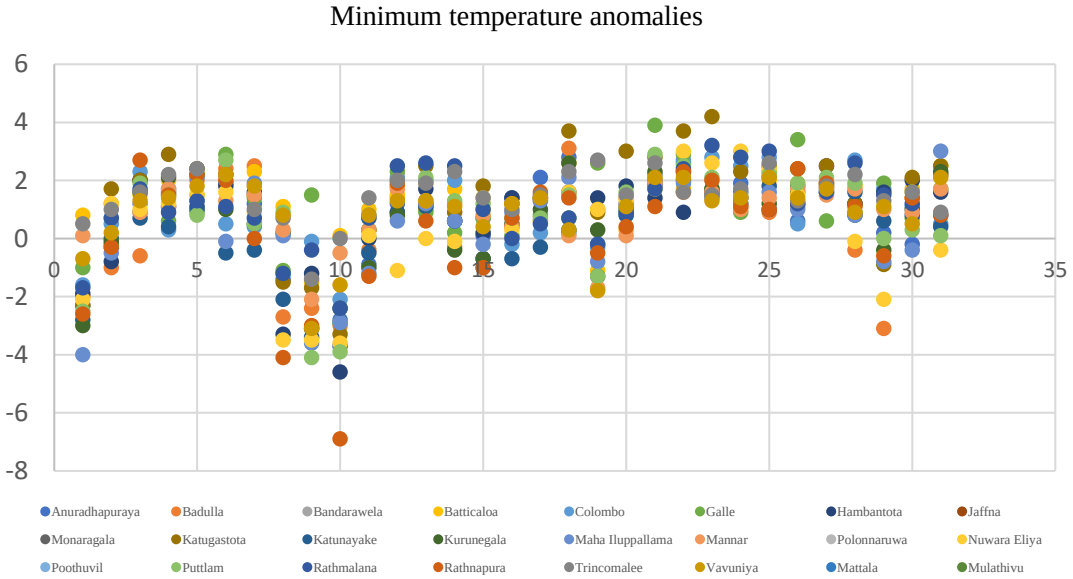


**Fig 10**: Minimum Temperature anomaly ($^0$C) for January 2024

## 5.0 Global condition

January saw a record-high monthly global ocean surface temperature for the 10th consecutive month. El-Niño conditions that emerged in June 2023 continued into January. During January 2024, observations indicate sea surface temperatures in the central and eastern tropical Pacific prevailed in its peak. The sea surface temperature (SST) for the NINO.3 region was above normal with a deviation of +2.2°C, which was almost the same since it became +2.2°C in August 2023. Niño 3.4 Index being +1.9, within strong El Niño range. Collectively, oceanic, and atmospheric anomalies were consistent with El-Niño conditions. The El-Niño condition prevailed in its peak strength during the month. The January global surface temperature was 1.27°C above the 20th-century average of 12.2°C, making it the warmest January on record. This was 0.04°C above the previous record from January 2016 (NOAA Climate prediction Center). Positive Indian Ocean Dipole (IOD) condition was reached its end and started its neutral phase. (BoM, Australia). Sea surface waters in tropical Indian Ocean are warmer than average (Fig. 11).

The average position of the shear line was laid between $07^0$S $50^0$E, $01^0$S $80^0$E, $01^0$N $90^0$E and $04^0$N $120^0$E. The average position of the Inter-Tropical Convergence zone (ITCZ) was laid between $11^0$S $50^0$E, $10^0$S $80^0$E and $07^0$S $100^0$E (Fig 12).

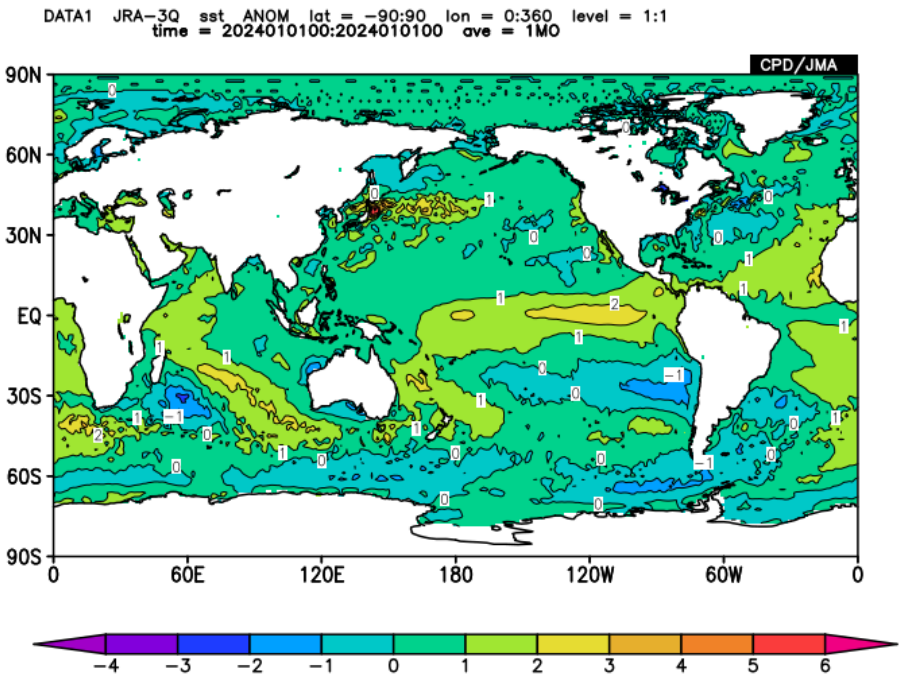


**Fig 11**: Sea Surface Temperature anomalies for January 2024(JMA)

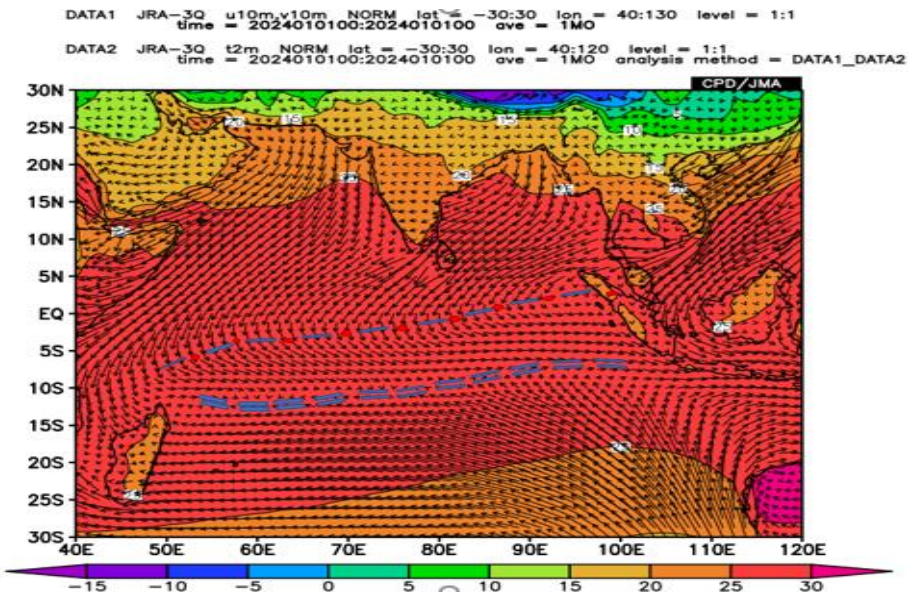


**Fig12**: Ocean Surface Winds and Ocean Surface Temperature for January 2024

### 5.1 Weather Systems

There were five cyclonic events recorded in the South Indian Ocean in this month while there were no cyclonic systems recorded in the north Indian Ocean. Severe Tropical Storm Alvaro (January 1-4) at the South Indian Ocean made landfall in Madagascar at the beginning of the month. The only major tropical cyclone was Intense Tropical Cyclone Anggrek (January 15-31) which developed in the middle of the month. Further, Tropical Cyclone Belal (January 12-19), Severe Tropical Storm Candice (January 25-27) and an unnamed tropical storm (January 31-February 2) also recorded during the period (Fig 13).

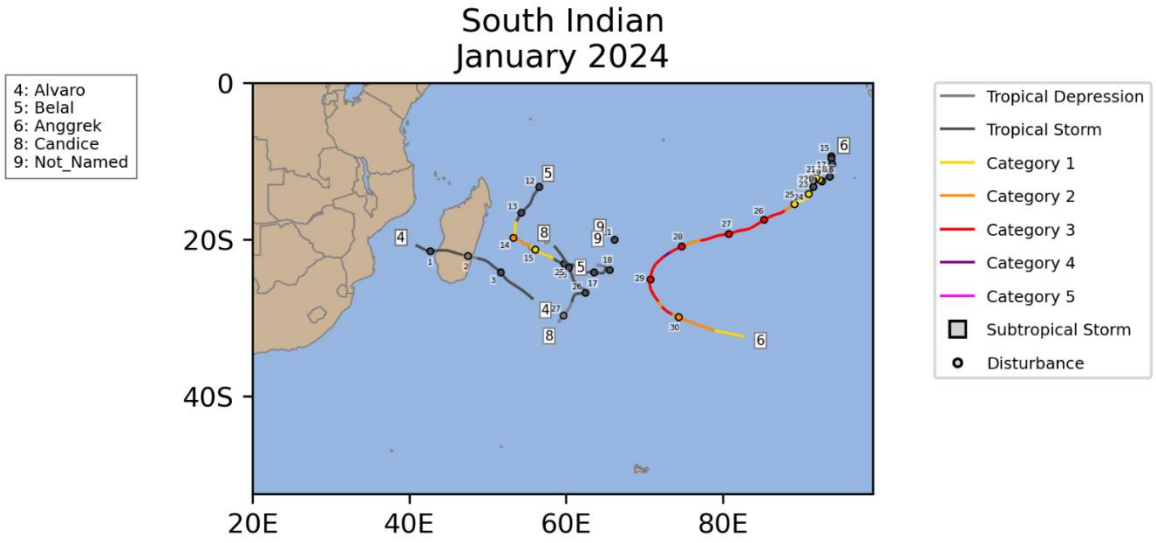


**Fig 13**: Track of Tropical cyclone systems reported in January 2024 (NOAA)

Strong Madden-Julian Oscillation (MJO) was in phase 2 on 01st January, propagated to the phase 3 from 02nd to 13th, and then propagated to phase 4, 5, 6 and 7 respectively (Fig. 14).

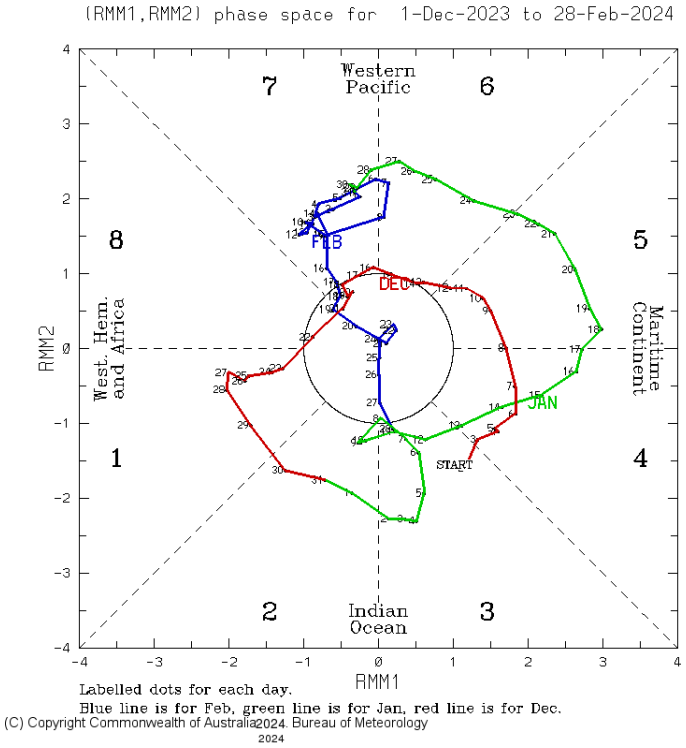


**Fig 14**: Phase diagram of MJO, Green line for January (BOM)