

## Weather Synopsis –January 2023.

Weak northeast monsoon conditions were prevailed. Below normal rainfall was reported at most of the principal meteorological stations except coastal station located in Northwestern , western , south western and southern coasts such as Mannar, Puttlam, Katunayake, Colombo, Rathmalana, Galle, Hambantota and Batticaloa, Anuradhapura, and Maha Illuppallama where above normal rainfall was reported (Fig 2). Maximum percentage was reported from Anuradhapura (198.8%) while minimum from Jaffna station (18.3% ).

Below normal rainfall was reported from most of the hydro catchment stations except **Castlereigh**, Maskeliya and Samanalaweva where above normal rainfall was reported (Fig 3) .

Highest cumulative rainfall was **343.8 mm** at Hiniduma in Ratnapura. Highest rainfall received during 24hours, was 109 mm at Hanwella on 16<sup>th</sup> January.

Higher Lightning density was reported in Hanwella, Kaduwela, Maharagama, Homagama , Kalawana, Elapatha and Dompe during month of January (Fig 1).

Mainly dry weather was reported from 01<sup>st</sup> to 02<sup>nd</sup> , from 11<sup>th</sup> to 13<sup>th</sup> , from 18<sup>th</sup> to 20<sup>th</sup> . Isolated afternoon thunderstorms were from Galle Matara and Ratnapura districts . Rainfall activity over eastern and northeastern parts was enhances from from 05<sup>th</sup> to 08<sup>th</sup> , from 16<sup>th</sup> to 17<sup>th</sup> on 21<sup>st</sup> and on 23<sup>rd</sup> . Isolated afternoon thunderstorms were also reported from Sabaragamuwa province and from Galle and Matara districts on 03<sup>rd</sup> and 04<sup>th</sup> , from 09<sup>th</sup> to 10<sup>th</sup> , 14<sup>th</sup> to 15<sup>th</sup> , from 24<sup>th</sup> to 28<sup>th</sup> .

Table 1 stations received above 100mm rainfall during January 2023

Date	Station	24 hour Rainfall (mm)
04-January 2023	Hiniduma	<b>108.3</b>
07-January 2023	Bandaragama	<b>104.9</b>
16-January 2023	Hanwella	<b>109.0</b>
21-January 2023	Akkaraipattu Irrigation	<b>100.1</b>
27-January 2023	Mylampavaley	<b>106.2</b>
27-January 2023	<b>Batticaloa</b>	<b>104.4</b>

The maximum temperatures in the day were mostly above normal in most places. However below normal maximum temperatures were reported at some places from 07 to 10<sup>th</sup>, 21<sup>st</sup> to 24<sup>th</sup>, on 27<sup>th</sup> and on 31<sup>st</sup> (Fig.12). Minimum temperatures over most parts were above normal except from 01<sup>st</sup> to 04<sup>th</sup>, from 10<sup>th</sup> to 13<sup>th</sup>, from 19<sup>th</sup> to 20<sup>th</sup>, from 29<sup>th</sup> to 30<sup>th</sup> when below normal night temperatures were reported (Fig 13). Highest recorded maximum temperature for the month of January 2023 was 34.1<sup>0</sup>C at Ratnapura on 15<sup>th</sup> and the lowest recorded minimum temperature for the month of January 2023 was 4.6<sup>0</sup>C at Nuwara Eliya on 17<sup>th</sup> of January 2023.

During January 2023, below-average sea surface temperatures persisted but weakened across the central and eastern equatorial Pacific. The latest monthly Nino indices were -0.7C for the Nino 3.4 region. Also during January, the lower-level easterly winds and upper-level westerly winds were above-average across most of the equatorial Pacific. Meanwhile, tropical convection was suppressed over much of the central and western equatorial Pacific and enhanced over western Indonesia. Collectively, oceanic and atmospheric anomalies were consistent with La Nina conditions. Ocean Nino Index is -0.8 during November, December and January and -0.7 during December, January and February (NOAA Climate prediction Center). Neutral IOD condition was observed during January 2023 (BoM, Australia). Sea surface waters in tropical Indian Ocean are warmer than average (Fig. 7)

The average position of the shear line was laid between 07<sup>0</sup>S50<sup>0</sup>E, Equator 80<sup>0</sup>E, 01<sup>0</sup>N 90<sup>0</sup>E and Equator 120<sup>0</sup>E. The average position of the Inter-Tropical Convergence zone (ITCZ) was laid between 12<sup>0</sup>S 40<sup>0</sup>E, 10<sup>0</sup>S70<sup>0</sup>E and 06<sup>0</sup>S100<sup>0</sup>E(Fig 4). Both shear line and ITCZ were fluctuated about 2<sup>0</sup> north and south of their average position (Fig 6).

Strong Madden-Julian Oscillation (MJO) was in phase 6 on 01<sup>st</sup> January, propagated to the phase 7 from 02 to 05<sup>th</sup> and weaken from 06<sup>th</sup> to 19<sup>th</sup>. It has strengthened at phase 3 from 20<sup>th</sup> onwards (Fig. 8).

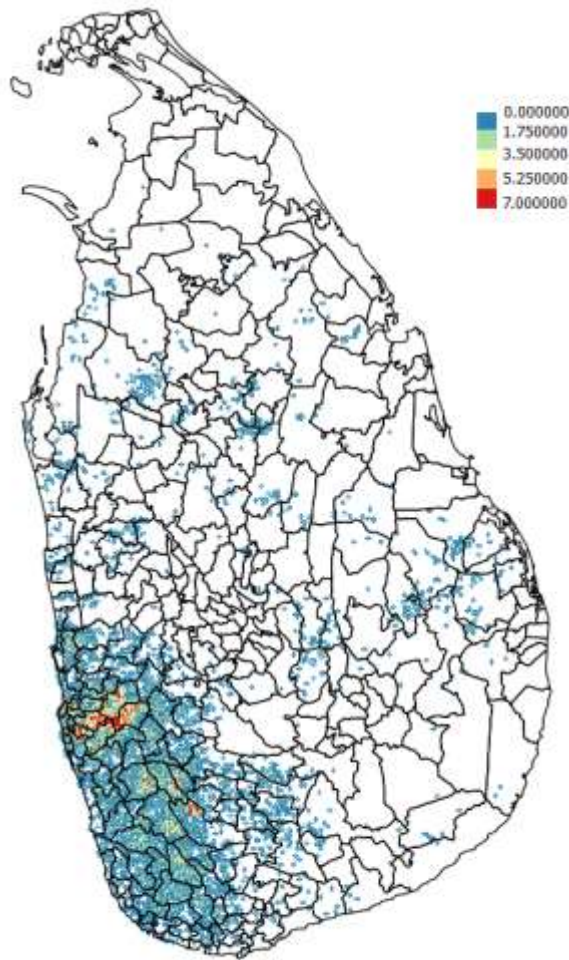


Fig 1: Lightning density map for January 2023

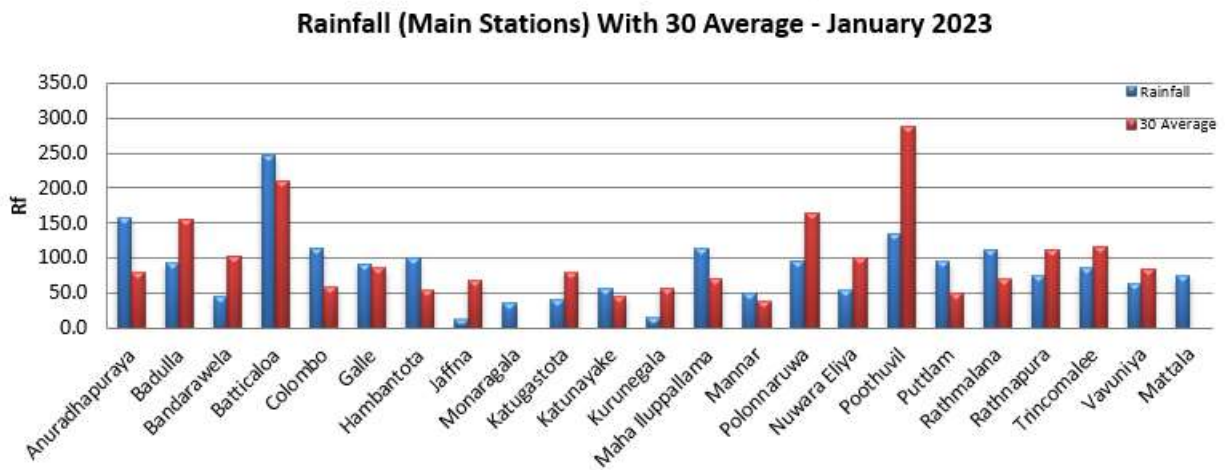


Fig 2: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during January 2023

**Rain Days with 30 Avg- January 2023**

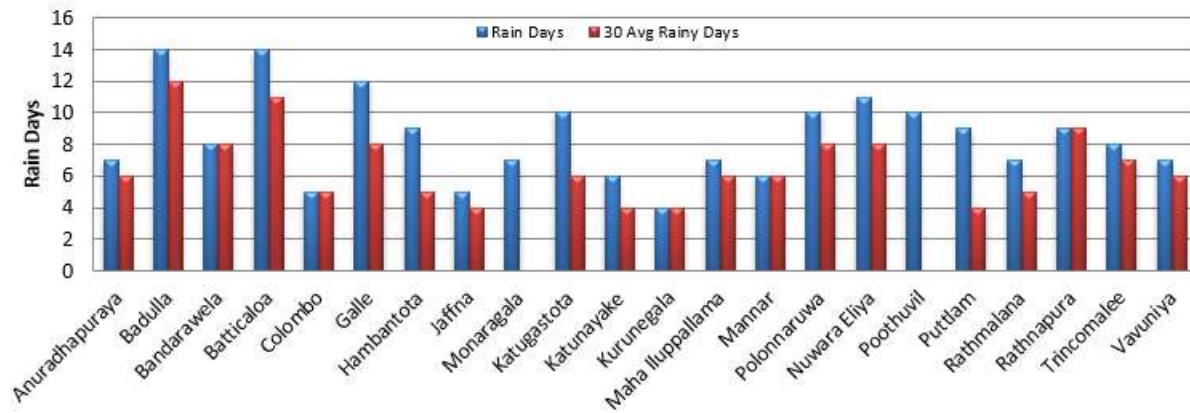


Fig 3: monthly total no of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during January 2023

**Rainfall (Hydro catchment area) With 30 Average- January 2023**

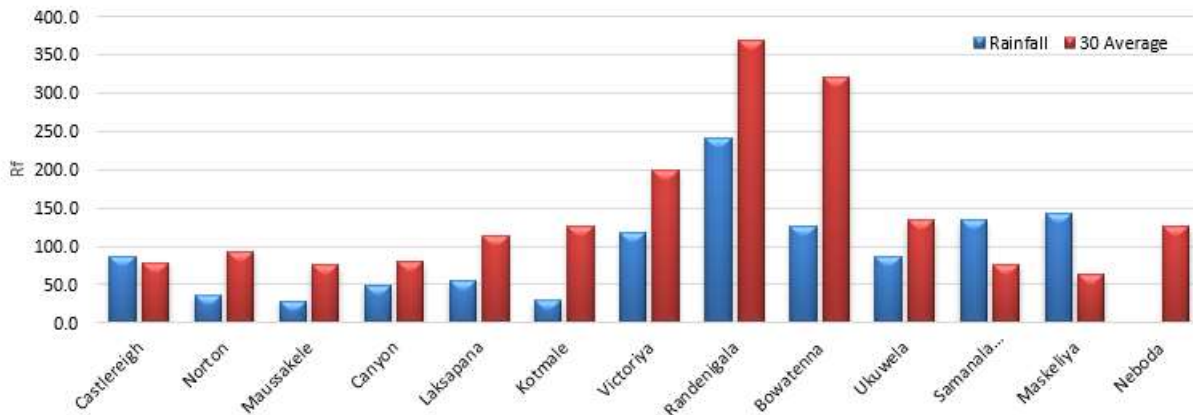


Fig 4: Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at Hydro catchment areas during January 2023

### Weather Systems

Tropical cyclone Cheneso formed on 16 January to the south of Diego Garcia. The cyclone crossed northern Madagascar on 17 January and quickly weakened as it crossed the country. It emerged into the Mozambique Channel as a weak tropical disturbance on 23rd and briefly re-intensified into a tropical

cyclone in open waters. After emerged into the Mozambique Channel, it was initially moved southward, then recurved southeastward and weakened by 29<sup>th</sup> January as a post-tropical depression (Fig 5).



Fig 5 : Track of Tropical cyclone Cheneso

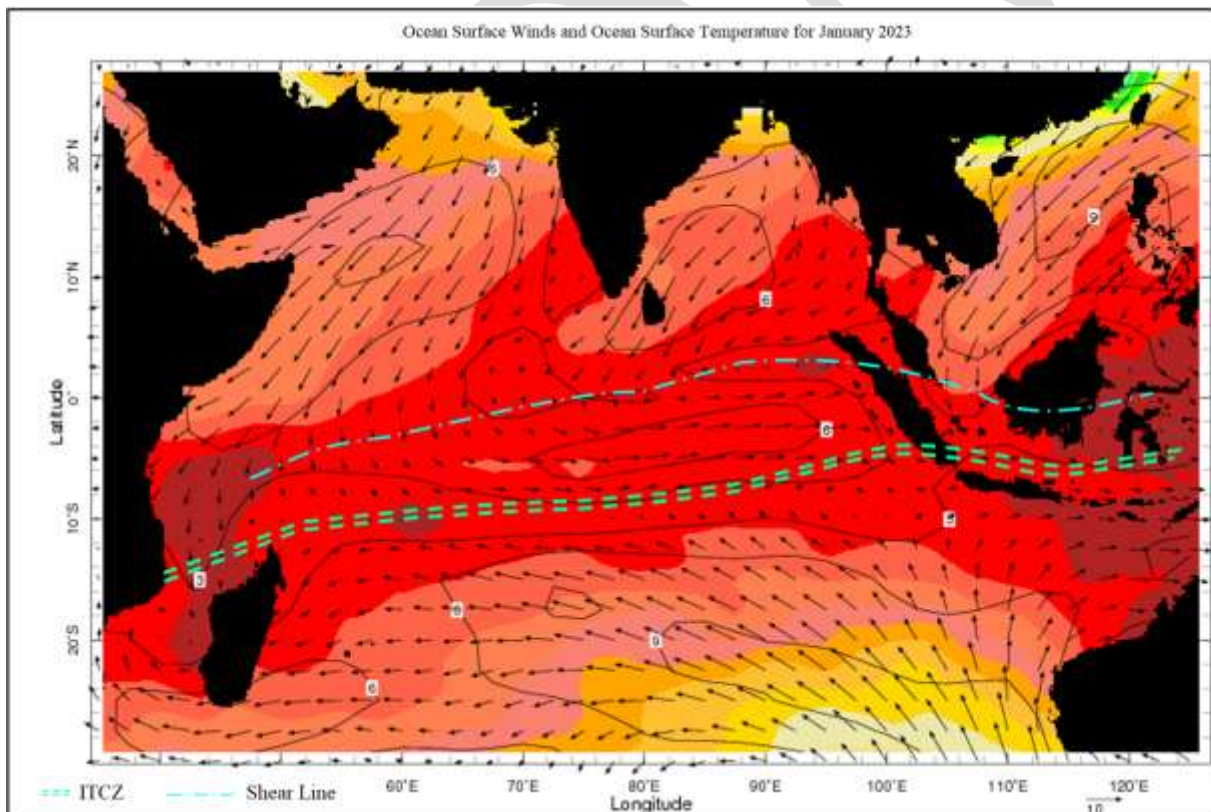


Fig 6: Ocean Surface Winds and Ocean Surface Temperature for January 2023



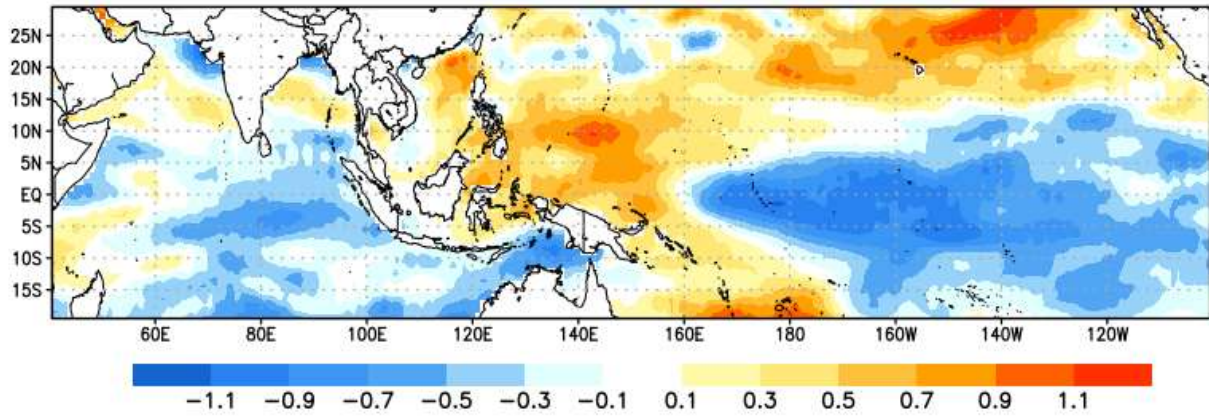


Fig 7: Sea Surface Temperature anomalies for January 2023

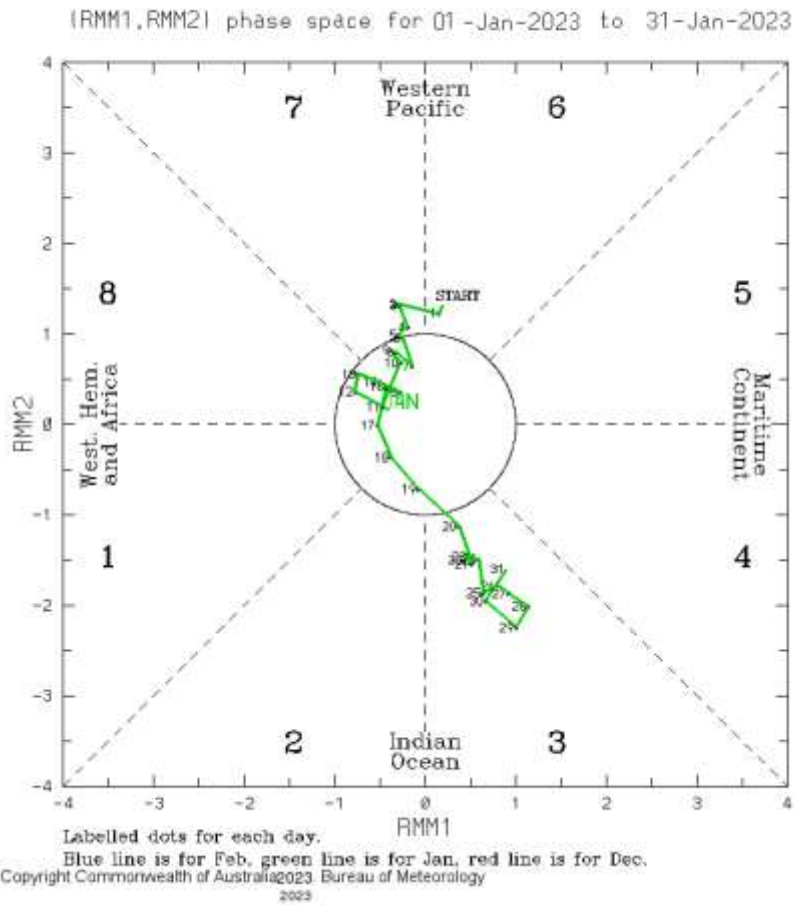


Fig 8: Phase diagram of MJO Index

**Surface pressure and winds:** The surface pressure was above average except on 12<sup>th</sup>, from 14<sup>th</sup> to 16<sup>th</sup>, and from 21<sup>st</sup> to 31<sup>st</sup>. when it was about or below average. Pressure distribution was even or fairly even during most of January except on 09<sup>th</sup>, on 18<sup>th</sup>, on 22<sup>nd</sup> and 31<sup>st</sup> when mild pressure gradient was observed.

Surface wind over the island was predominantly North easterly in direction with speed of 05-10 knots variable 05 knots.

### Upper winds:

**At 850hPa,** Northeasterly wind flow is dominated over the island. Anomalous westerly winds indicate weakening of monsoon flow at 850mb level. Anomalous ridge appeared over Sri Lanka suppressed the rainfall activity (Fig 9).

**At 700 hPa,** Northeasterly wind flow is dominated over the island. Anomalous northeasterly winds across Sri Lanka indicate strengthening of monsoon flow at 700mb level(Fig 10).

**At 500 hPa,** Northeasterly wind flow is dominated over the island. Anomalous northeasterly winds across Sri Lanka indicate strengthening of monsoon flow at 500mb level(Fig 11).

**The 200 hpa** the upper tropospheric ridge was laid from 11<sup>o</sup>N40<sup>o</sup>E,14<sup>o</sup>N60<sup>o</sup>E,15<sup>o</sup>N80<sup>o</sup>E,and17<sup>o</sup>N120<sup>o</sup>E.

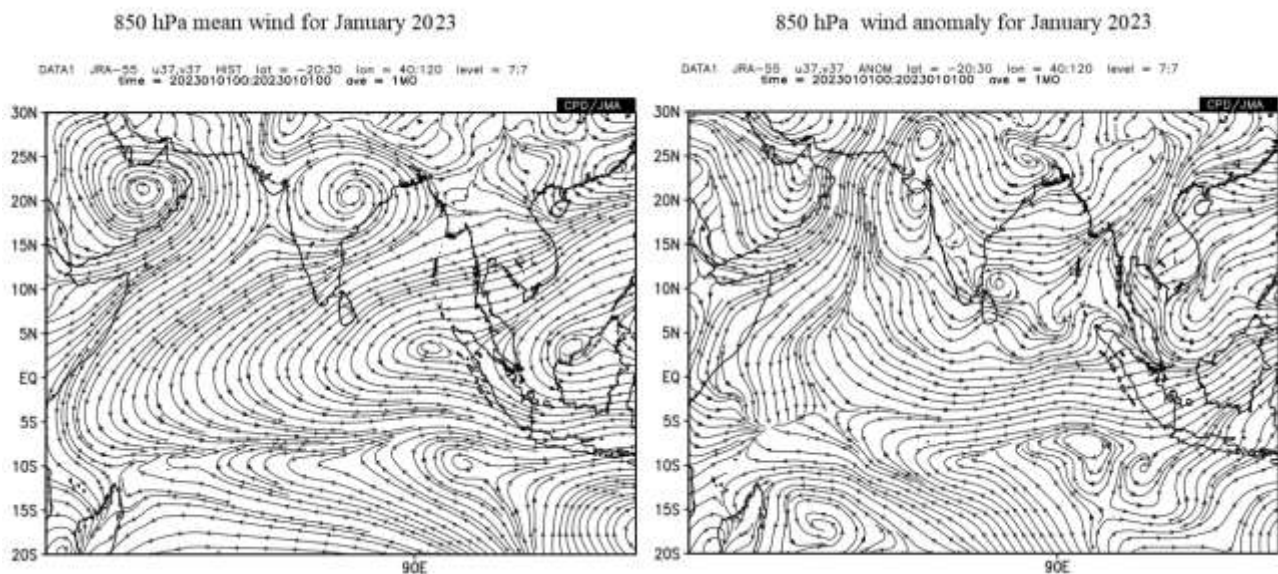


Fig. 9 Monthly average wind pattern at 850hpa level during the month of January2023 (JRA55)

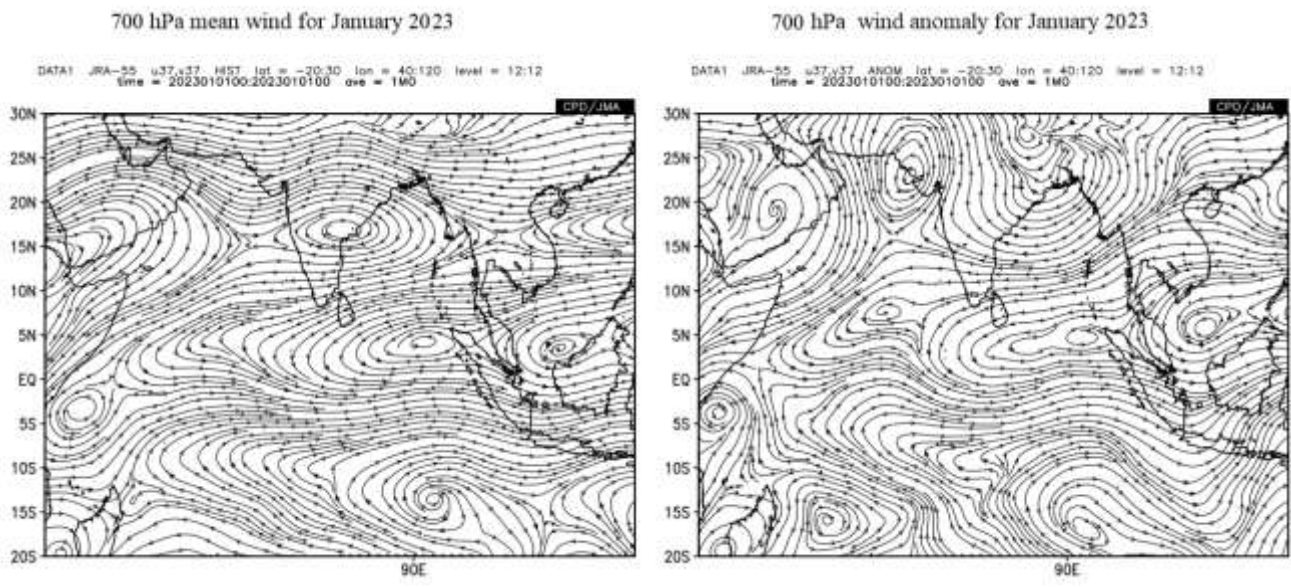


Fig. 10 Monthly average wind pattern at 700hpa level during the month of January2023 (JRA55)

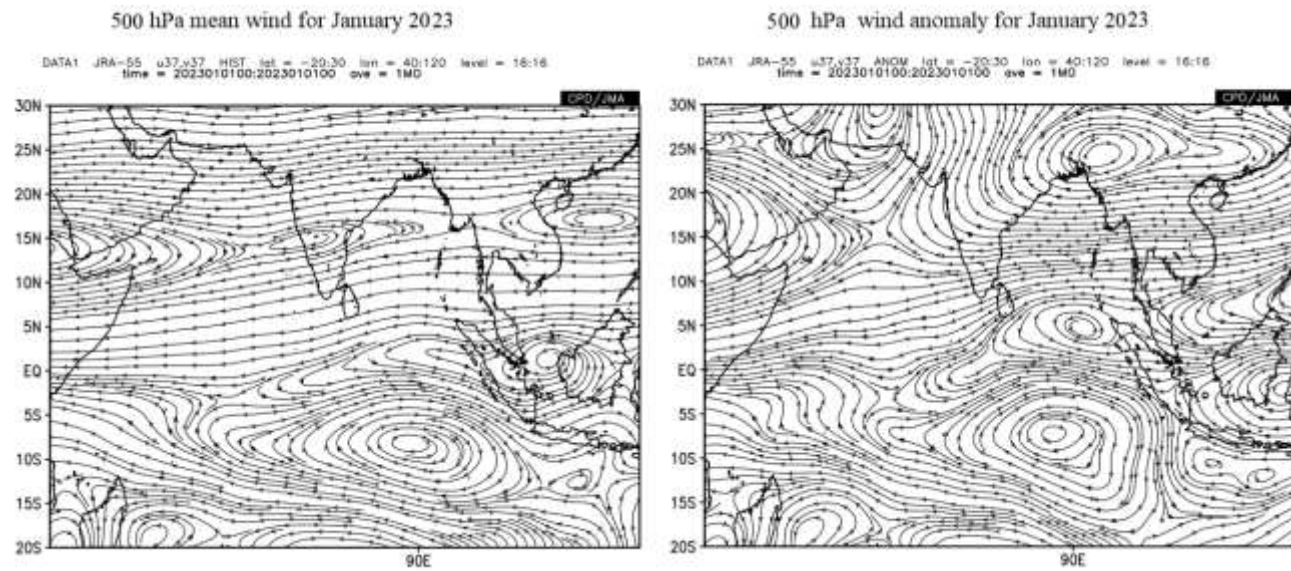


Fig. 11 Monthly average wind pattern at 500hpa level during the month of January2023 (JRA55)

**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 07 to 10<sup>th</sup> , 21<sup>st</sup> to 24<sup>th</sup> , on 27<sup>th</sup> and on 31<sup>st</sup> (Fig.12). Highest recorded maximum temperature for the month of January 2023 was 34.1<sup>0</sup>C at Ratnapura on 15<sup>th</sup> (Table 4a).



Night minimum temperatures over most parts were above normal except from 01<sup>st</sup> to 04<sup>th</sup> , from 10<sup>th</sup> to 13<sup>th</sup> , from 19<sup>th</sup> to 20<sup>th</sup> , from 29<sup>th</sup> to 30<sup>th</sup> when below normal night temperatures were reported. Lowest recorded minimum temperature for the month of January 2023 was 4.6<sup>o</sup>C at Nuwara Eliya on 17<sup>th</sup> (Table 4b).

Maximum and Minimum departures from normal day/night temperature were shown in table 3.

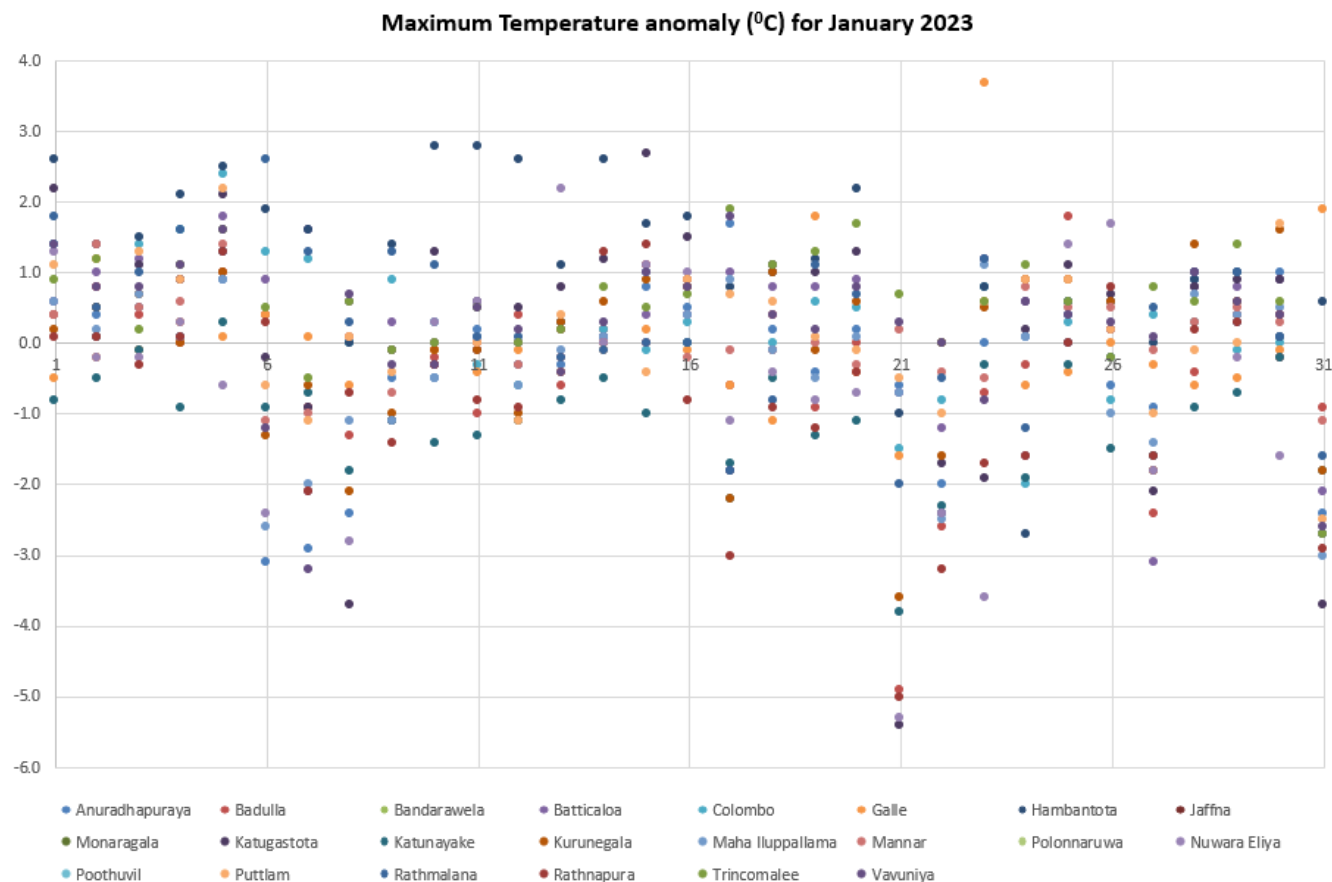


Fig 12 Maximum Temperature anomaly (<sup>o</sup>C) for January 2023

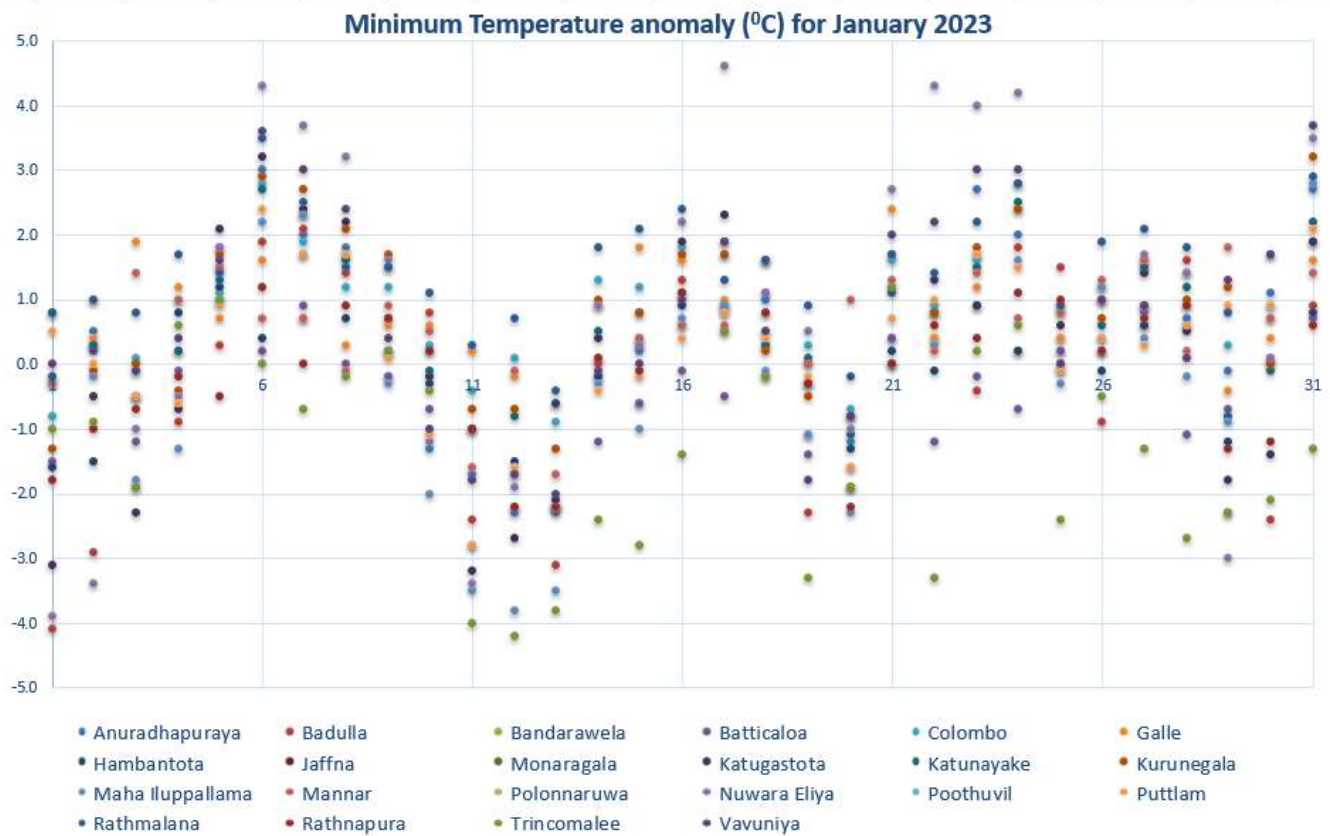


Fig 13 Minimum Temperature anomaly ( $^{\circ}\text{C}$ ) for January 2023

Below normal rainfall was reported at most of the principal meteorological stations except coastal station located in Northwestern , western , south western and southern coasts such as Mannar, Puttlam, Katunayake, Colombo, Rathmalana, Galle, Hambantota and Batticaloa, Anuradhapura, and Maha Illuppallama where above normal rainfall was reported (Fig 1). Maximum percentage was reported from Anuradhapura (**198.8%**) while minimum from Jaffna station (18.3% ).

Below normal rainfall was reported from most of the hydro catchment stations except Norton, Canyon and Samanalaweva where above normal rainfall was reported.

Highest cumulative rainfall was **343.8 mm** at Hiniduma in Ratnapura. Highest rainfall received during 24hours, was 109 mm at Hanwella on 16<sup>th</sup> January.

The monthly total rainfall at hydro catchment areas, total rainfall and the number of rain days at the principal meteorological stations, are shown in tables 1 and 2.

Table-02-Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Hydro catchment areas

Hydro Catchment	Jan 2023	Average	% (percentage of average)
Castlereigh	87.4	78.7	111.0%
Norton	35.8	92.8	38.6%
Maussakele	28.6	75.5	37.9%
Canyon	48.9	79.3	61.7%
Laksapana	54.5	114.0	47.8%
Kotmale	29.6	126.6	23.4%
Victoriya	117.3	199.2	58.9%
Randenigala	242.3	369.7	65.5%
Bowatenna	126.1	321.3	39.3%
Ukuwela	86.8	134.1	64.7%
Samanala Wewa	134.5	76.9	174.9%
Maskeliya	142.4	63.1	225.7%
Neboda		126.2	

Table-03- total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages (1961-1990).

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

Table 3 :The monthly total rainfall and the number of rain days at the principal meteorological stations

Meteorological station	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
	2023-Jan	Average	%	2023-Jan	Average	%
Anuradhapuraya	157.4	79.2	198.8%	7	6	116.7%
Badulla	92.2	155.2	59.4%	14	12	116.7%
Bandarawela	44.9	102.4	43.9%	8	8	100.0%
Batticaloa	247.3	210.3	117.6%	14	11	127.3%
Colombo	113.3	58.2	194.7%	5	5	100.0%
Galle	91.1	85.1	107.1%	12	8	150.0%
Hambantota	100.0	55.1	181.4%	9	5	180.0%
Jaffna	12.3	67.1	18.3%	5	4	125.0%
Monaragala	35.4			7		
Katugastota	40.8	79.4	51.4%	10	6	166.7%
Katunayake	55.6	45.8	121.5%	6	4	150.0%
Kurunegala	15.5	56.4	27.4%	4	4	100.0%
MahaIluppallama	112.7	69.8	161.5%	7	6	116.7%
Mannar	49.8	38.7	128.7%	6	6	100.0%
Polonnaruwa	95.6	163.5	58.5%	10	8	125.0%
Nuwara Eliya	55.1	100.6	54.8%	11	8	137.5%
Poothuvil	135.3	288.4	46.9%	10	na	#VALUE!
Puttlam	94.8	50.1	189.2%	9	4	225.0%
Rathmalana	111.5	69.3	160.9%	7	5	140.0%
Rathnapura	75.2	111.1	67.7%	9	9	100.0%
Trincomalee	85.2	115.6	73.7%	8	7	114.3%
Vavuniya	63.2	84.2	75.1%	7	6	116.7%
Mattala	73.6			10		

Table 4(a) - Extremes of Maximum Temperatures			January	2023
	Maximum		Highest Std. Div	
	Value	Offsets		
		(-)	(+)	
Value	34.1°C	5.4	3.7	1.78
Station	Ratnapura	Katugastota	Galle	Katugastota
Date	15/01	21/01	23/01	
Table 4(b) -Extremes of Minimum Temperature January2023				
	Minimum		Highest Std.Div	
	Value	Offsets		
		(-)	(+)	
Value	5.5C	4.2	4.6	2.52
Station	Nuwara Eliya	Trincomalee	Nuwara Eliya	NuwaraEliya
Date	01/01	12/01	17/01	

Prepared by National Meteorological Centre(NMC)  
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