Weather Synopsis –March 2021.

Above normal rainfalls were received over Southern, southwestern, western and central parts while below normal rainfalls were received over north western, northern, north central and north eastern parts of the island (Figs 1, 2,and 3). Most of hydro catchment areas reported above normal rainfalls except Bowathenna where below normal rainfall were observed (Fig 2). Mean maximum were 1.0-2.5^{0}C above average over most parts of the island except from 21st to 27th when below average maximum temperatures were reported at several stations (Figs 11 and 12) while above average minimum temperatures were reported except during the first week of the month when below average minimum temperatures were experienced at several stations.

Mainly fair weather prevailed over most parts of the island during first week except for a few afternoon or evening thundershowers reported from Southern parts of the island. Fairly heavy showers with thunder were reported from Southern half of the country on 06th, 11th, 14th, 20th and 22nd , western half of the country from 26th to 29th and, most parts of the island from 07th to 08th , and on 10th.

Highest monthly rainfall was reported from Vogan Estate and it was 505.3mm. The recorded maximum daily rainfall during month of March was 165 mm at Yala on 29th.
The recorded maximum temperature was 37.1^{0}C on 04th at Ratnapura, while recorded minimum temperature was 5.6^{0}C on 02nd at NuwaraEliya.

During March 2021, sea surface temperatures (SSTs) remained below-average across the central and eastern equatorial Pacific with borderline LaNina conditions in the eastern equatorial Pacific. Ocean Nino Index is around -0.8 during February March, and April (NOAA Climate prediction Center). Sea surface waters in north Indian Ocean and in the tropical western Pacific are warmer than averagewhile near average SSTs are apparent in the vicinity of Sri Lanka (Fig.4) and IOD neutral conditions were observed during month of March 2021

The Madden-Julian Oscillation (MJO) was weak during the 1st week and strengthen at the phase 1 during 2nd week, propagated to the phase 2 from 20th to 25th, enter to the phase 3 from 26th to 27th and propagated to phase 4 during last few days of March (Fig 5).

During the month, the average position of Inter Tropical Convergence Zone laid between 10^0S and 12^0S from 40^0E to 120^0E (Fig 6). The average position of the shearline laid between 04^0S 50^0E, equator 70^0E and 02^0N from 80^0E to 120^0E.

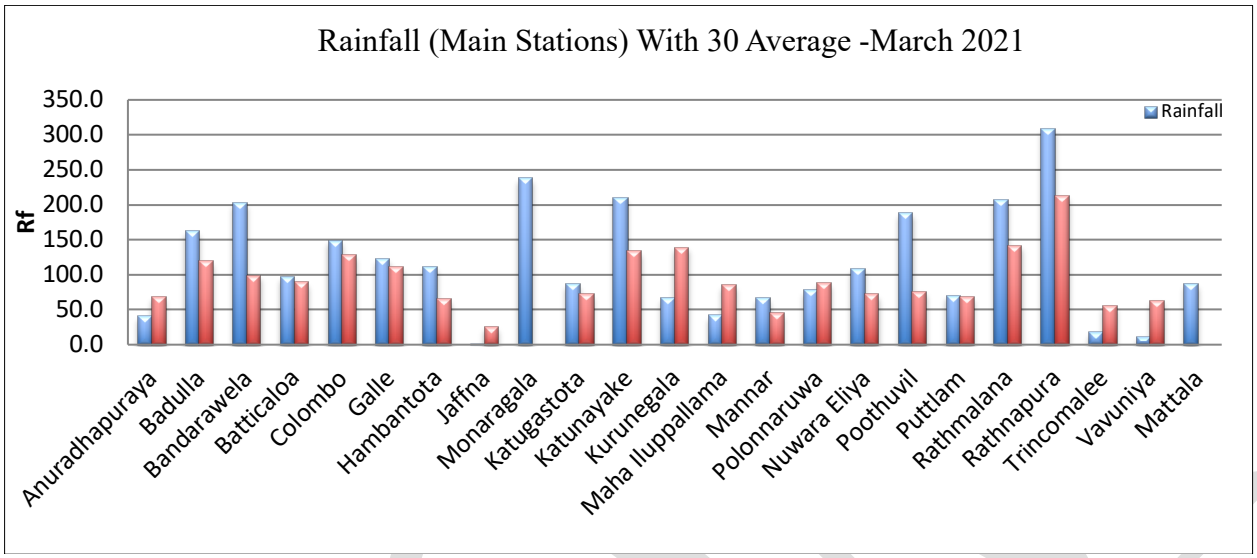

Fig 1 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during March 2021

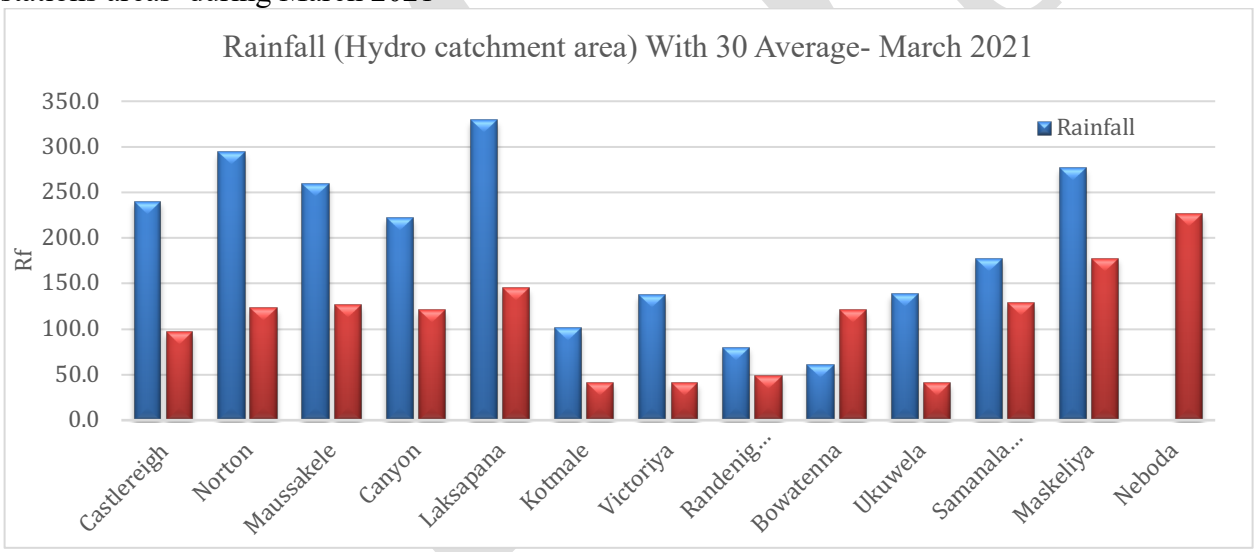

Fig 2 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Hydro catchment areas during March 2021

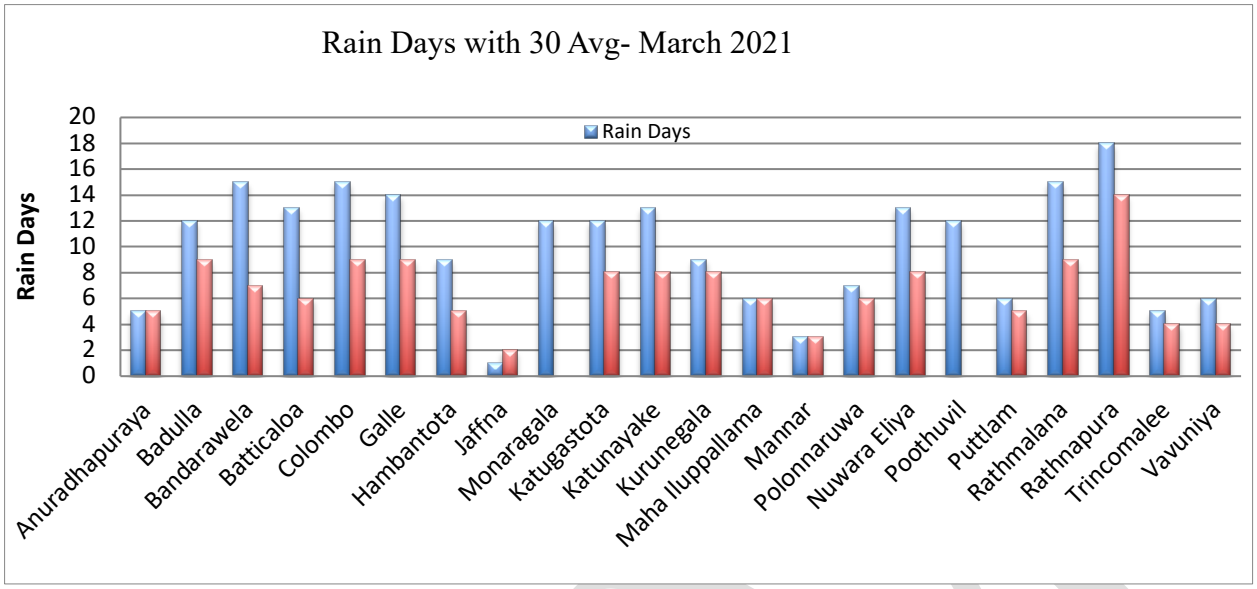

Fig 3 monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during March 2021

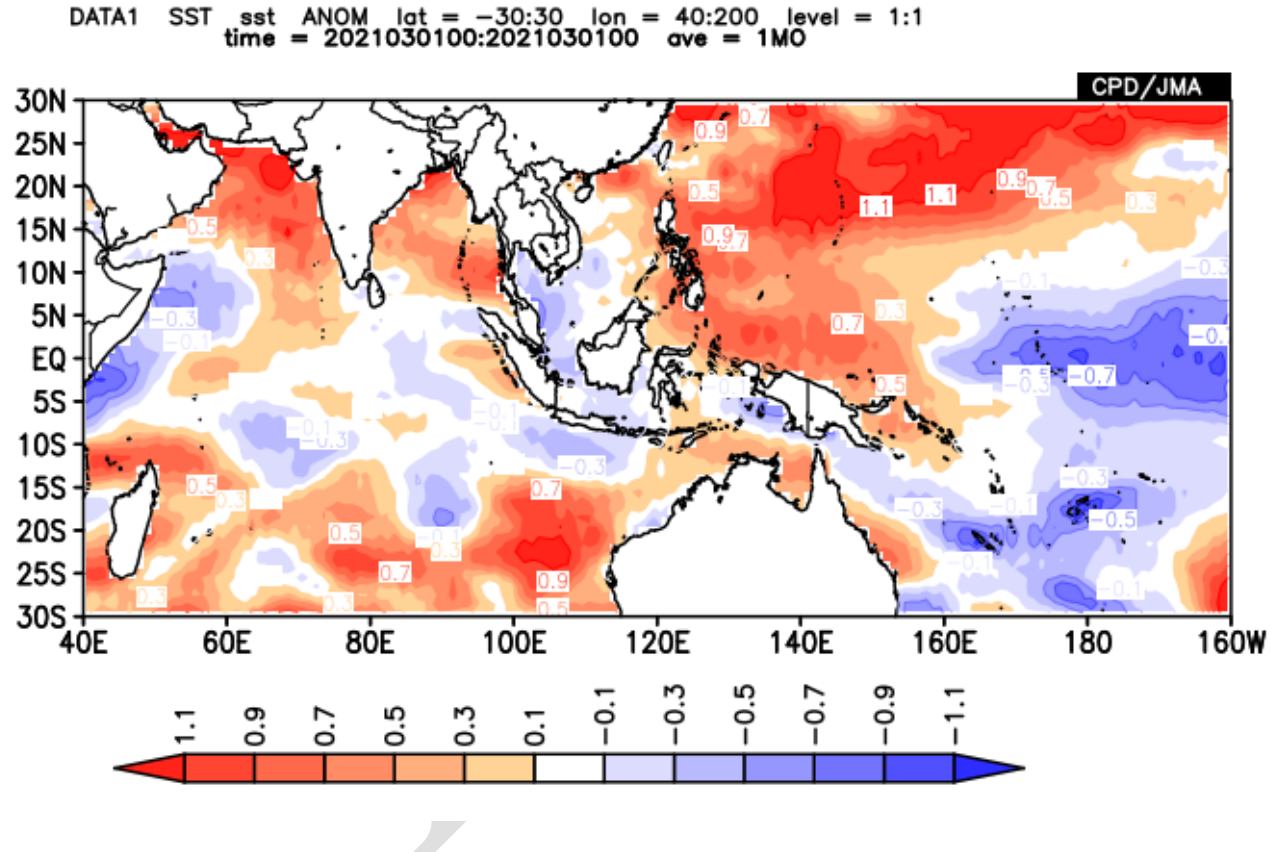

Fig 4 : Sea Surface Temperature anomaly for March 2021

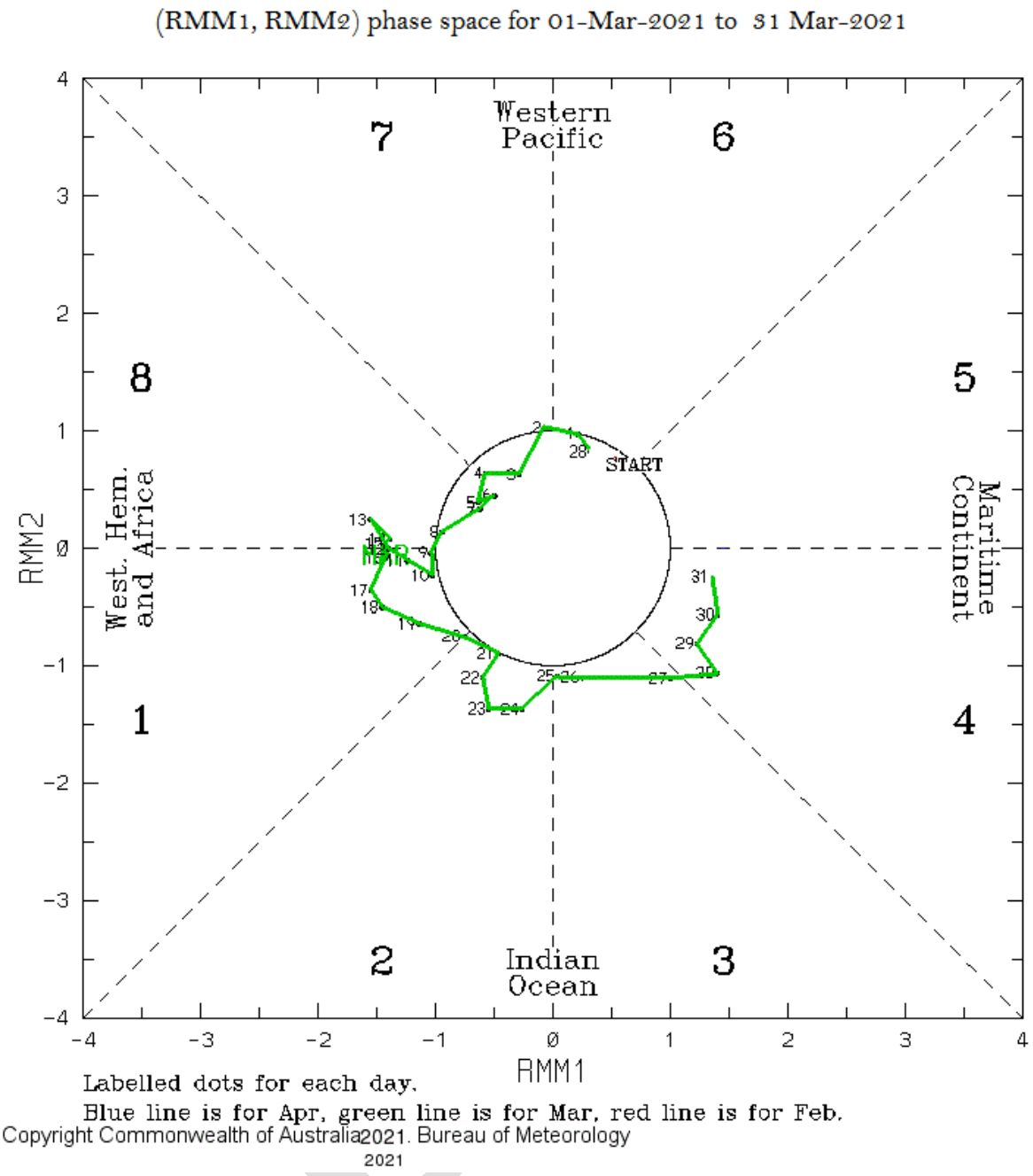

Fig 5 :MJO Phase diagram

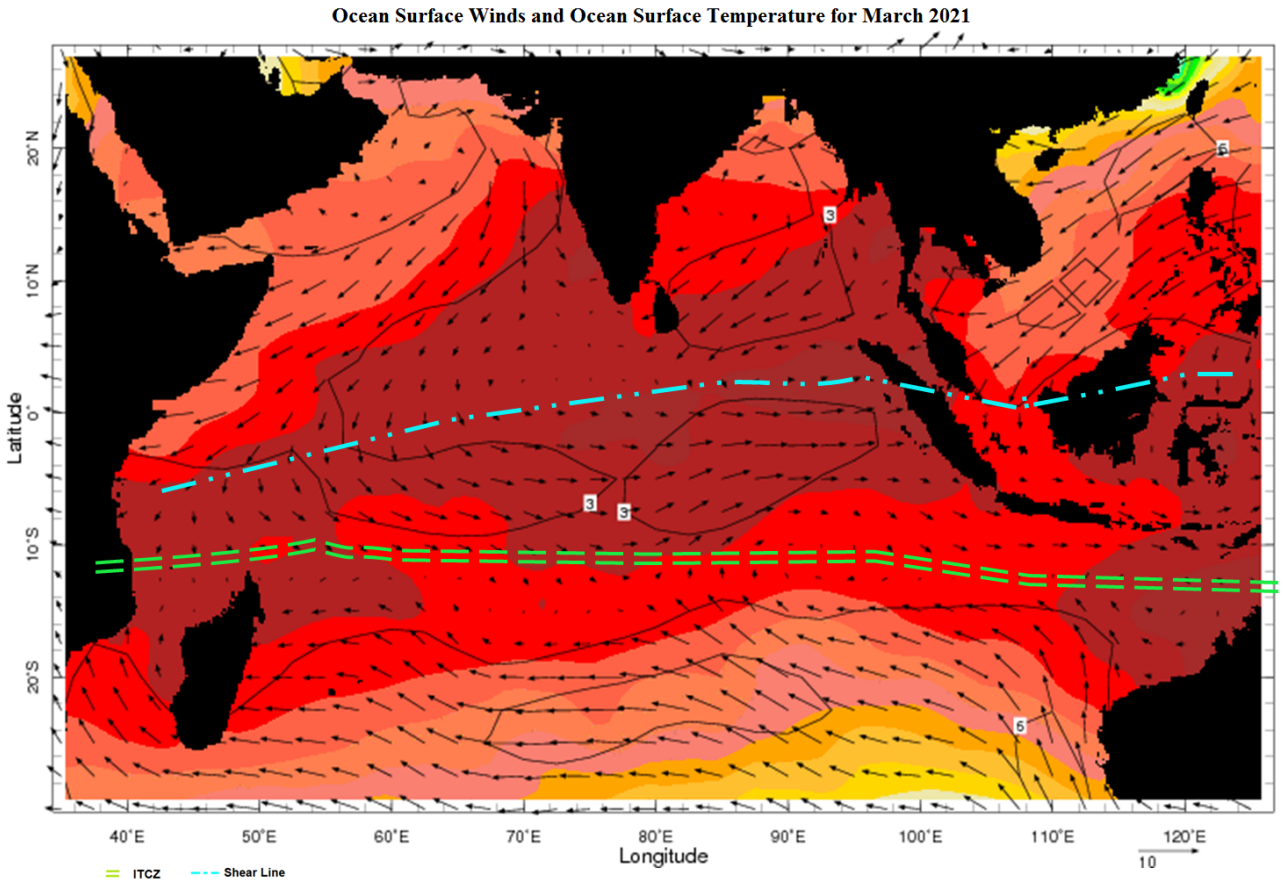

Fig 6 : Ocean Surface Winds and Ocean Surface Temperature for March 2021

Weather Systems:

In the south Indian Ocean, A tropical disturbance formed in the Mozambique Channel on 2nd March and strengthen to a tropical depression by the 03rd. It made landfall in Madagascar around on 5th March as a tropical depression and began to rapidly weaken while moving towards southeast.

After crossing Madagascar landmass, the system re-emerged over Southwest Indian Ocean on 6 March, and intensify into Tropical Storm Iman on 07th, but began to dissipate while moving into a region with strong wind shear on 08 March.

A tropical disturbance developed near 14^0S, 65^0E on 03rd March and intensify in to a depression on 04th March around 15^0S 70^0E tracked southeastward while rapidly intensify further into a cyclone Habana on 05th . On 7th March, the storm encountered some dry air and began to weaken and change the direction of movement.

After completing a turn to the south-southwest on 9th March, Habana slowly gained strength as it moved into more favorable conditions. By 10th March, Habana began to rapidly intensify yet again to an intense tropical cyclone while moving in northwest direction till 11th March and then slightly change the direction of movement towards southwest. Over the next 2 days, as wind shear quickly became unfavorable and relative humidity decreased significantly, the storm began to rapidly weaken on 14 March. On the same day, the system also made a small counterclockwise loop to the east. Habana soon weakened further as dry air continued to dissipate the system on 16th March.

Surface pressure and winds: The surface pressure was about or below average except from1st to 02nd, 05th to 06th, and 12th to14th March, when above average surface pressure values observed. Pressure distribution was fairly even or even. Mild pressure gradient was observed on 31st March .
The surface wind was predominantly calm/05kts and variable in direction .

Upper winds:

At 850hPa, North-easterly wind flow is dominated over the island. Averaged ridge axis was positioned from 24^0N50^0E, 18^0N60^0E, 18^0N70^0E, 20^0N80^0E, 16^0N90^0E, and 22^0N120^0E.

At 700 hPa, North-easterly wind flow is dominated over the island. Averaged ridge axis was positioned from 23^0N50^0E, 20^0N75^0E, 17^0N100^0E, ,and 18^0N120^0E.

At 500 hPa, easterly wind flow dominated during the month. Averaged ridge axis was positioned over Sri Lanka from 18^0N50^0E, 15^0N75^0E, 14^0N85^0E, and 15^0N120^0E.

The 200 hPa the upper tropospheric ridge was laid between 15^0N to 12^0N bringing predominantly southeasterly winds across Sri Lanka.

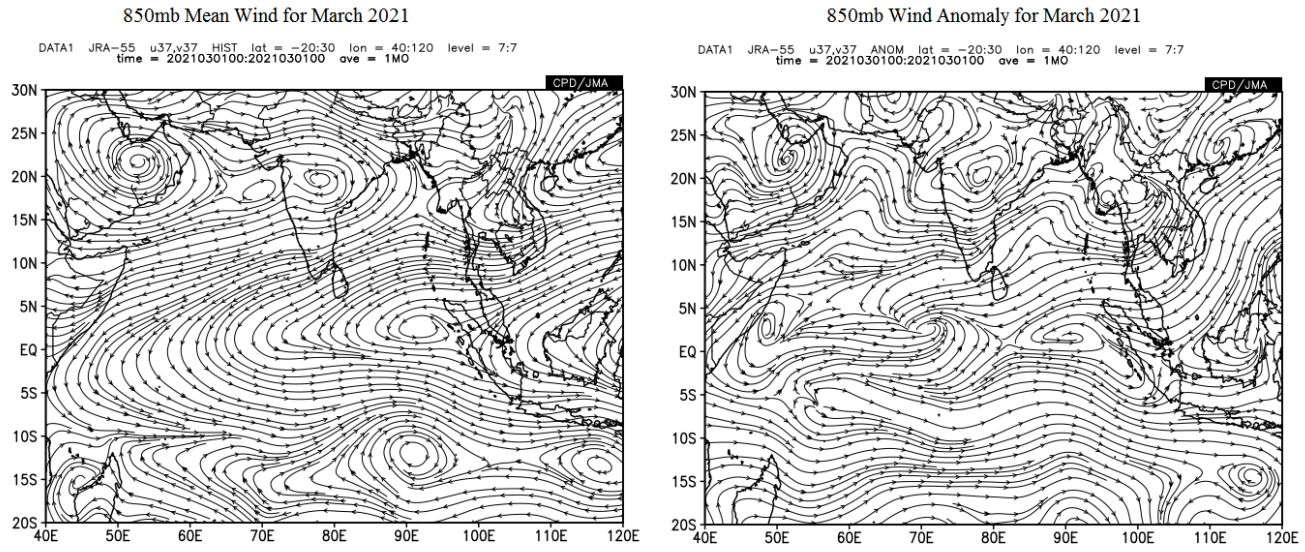

Fig 8 Monthly average wind pattern at 850hpa level during the month of March 2021 (JRA55)

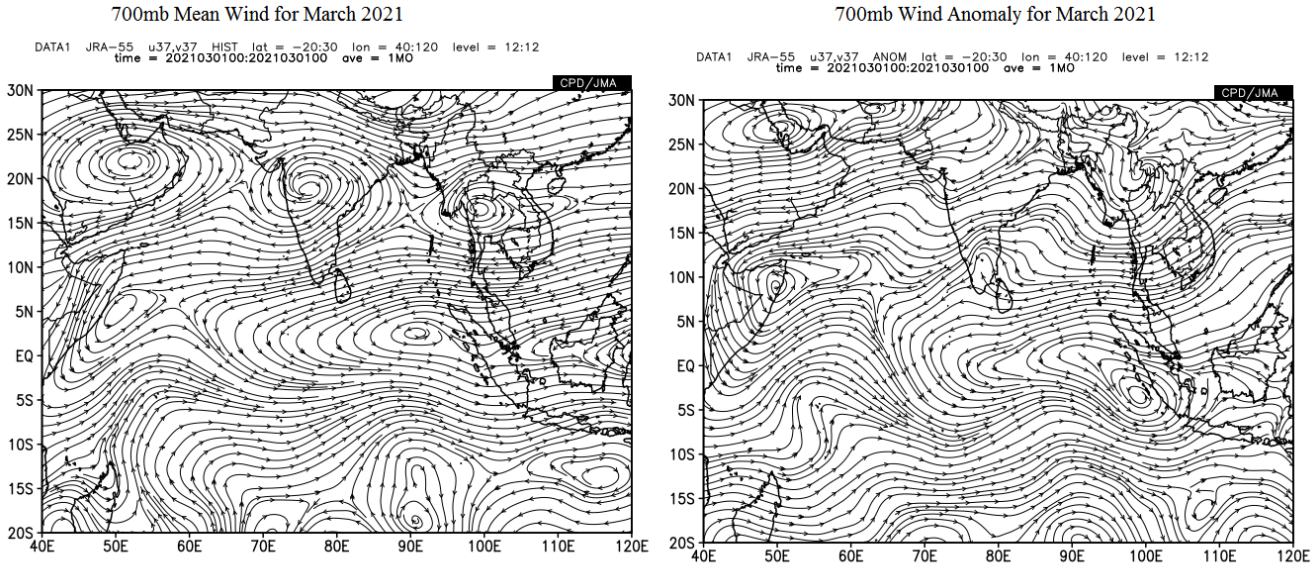

Fig 9 : Monthly average wind pattern at 700 hPa level during the month of March 2021(JRA55)

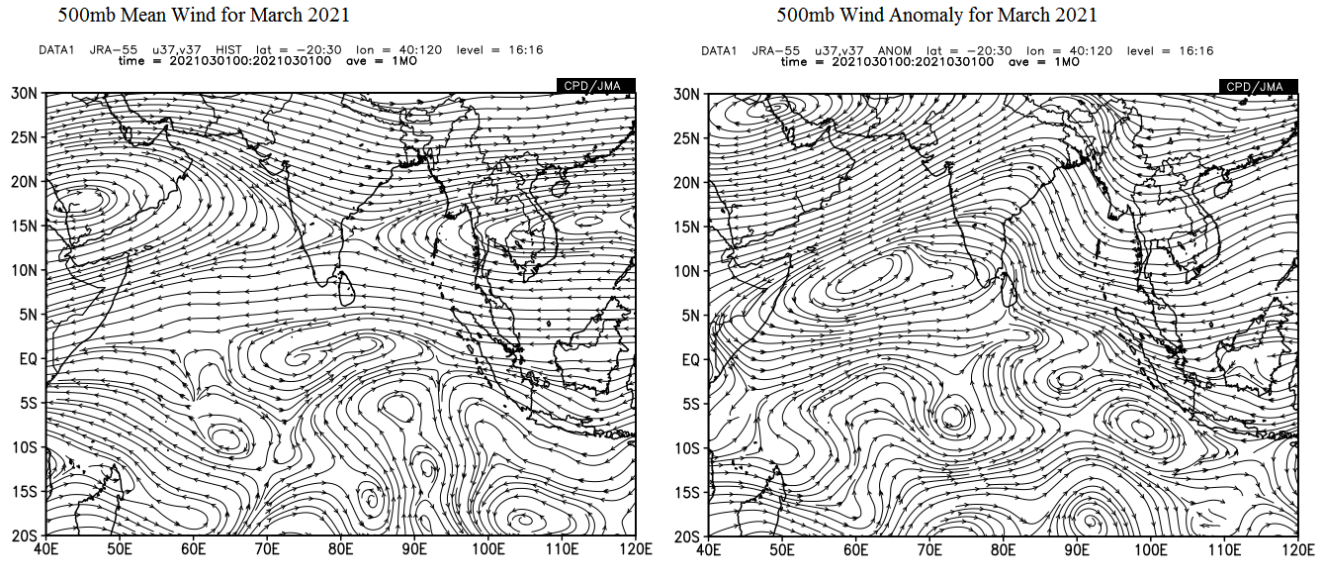

Fig.10: Monthly average wind pattern at 500 hpa level during the month of March 2021 (JRA55)

Temperature Field:

-1^{0}C to +1^{0}C fluctuation of maximum temperatures with respect to the climatological average were reported at most of the stations of during the month. Above normal day temperatures were experienced at Tricomalee while day temperatures were mostly below average at Ratnapura during last 3 weeks of the month. 2^0-4^{0}c above normal maximum temperatures were reported at Galle during second week. Highest recorded maximum temperature for the month of March 2021 was 37.1^{0}C from Ratnapura on 04th March.

Night minimum temperatures over most parts were below normal during the first week and above normal during the remaining weeks of month. 3-5^{0}C degrees below normal night temperatures were reported from Badulla during 1st week while below normal night temperatures were reported at Tricomalee during most nights of the months. Lowest recorded minimum temperature for the month of March 2021 was 5.6^{0}C from NuwaraEliya on 02nd.

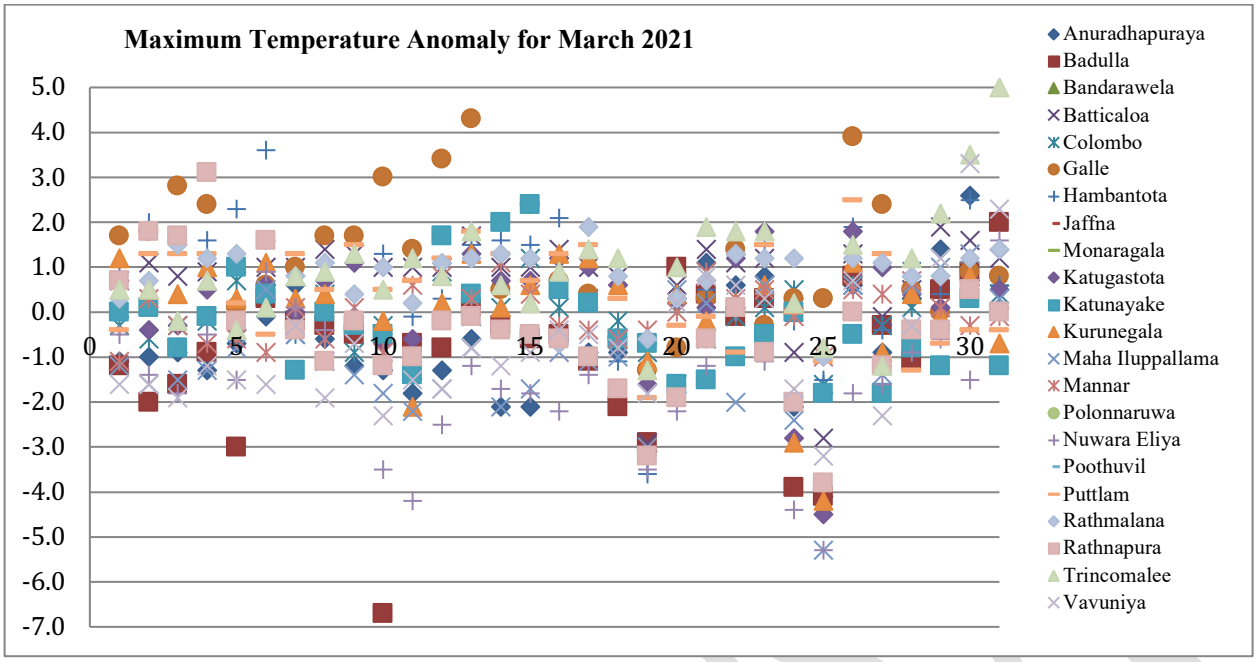

Fig 11 Maximum Temperature anomaly (^{0}C) for March 2021

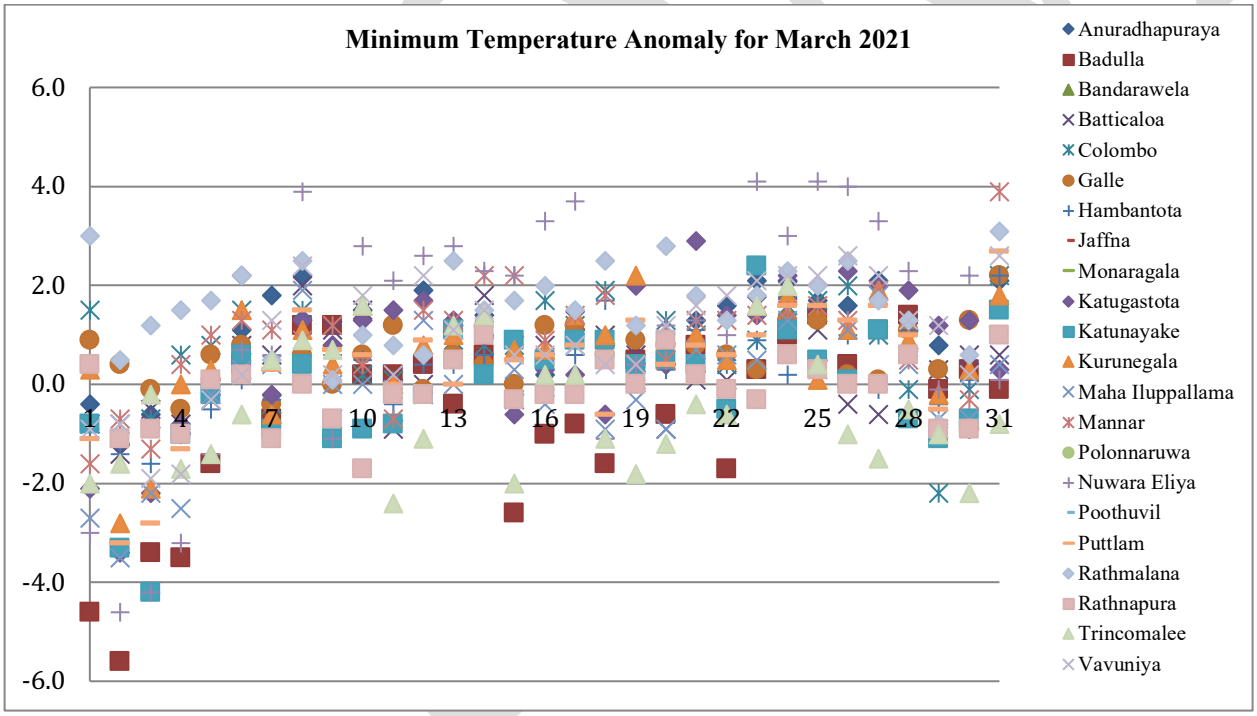

Fig 12 Minimum Temperature anomaly (^{0}C) for March 2021

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

Rainfall:

Above normal rainfalls were received over southern, southwestern, western and central parts while below normal rainfalls were received over north western, northern, north central and north eastern parts

of the island (Figs 1, 2,and 3). Most of hydro catchment areas reported above normal rainfalls except Bowathenna where below normal rainfall were observed (Fig 2). Maximum percentage was reported from Pottuwil (**249.1%**) while minimum from Jaffna station (**6.2%**) (Table 2). Number of rainy days was above average (Fig 9).

Highest monthly rainfall was reported from Vogan Estate and it was 505.3mm.The recorded maximum daily rainfall during month of March was 165 mm at Yala on 29th.

The table 2 and the figures 2 and 4 show the total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages

Table-01-Monthly Total Rainfall(mm) and monthly total number of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during March 2021

	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
Meteorological station	2021-March	Average	%	2021-March	Average	%
Anuradhapuraya	40.5	68.7	59.0%	5	5	100.0%
Badulla	162.4	119.4	136.0%	12	9	133.3%
Bandarawela	202.3	98.5	205.4%	15	7	214.3%
Batticaloa	97.0	89.0	109.0%	13	6	216.7%
Colombo	148.6	128.0	116.1%	15	9	166.7%
Galle	122.4	111.3	110.0%	14	9	155.6%
Hambantota	111.7	65.4	170.8%	9	5	180.0%
Jaffna	1.6	25.7	6.2%	1	2	50.0%
Monaragala	238.1			12		
Katugastota	86.4	71.9	120.2%	12	8	150.0%
Katunayake	209.7	132.9	157.8%	13	8	162.5%
Kurunegala	66.6	139.1	47.9%	9	8	112.5%
Mahailluppallama	41.3	84.9	48.6%	6	6	100.0%
Mannar	66.5	44.4	149.8%	3	3	100.0%
Polonnaruwa	78.1	87.9	88.9%	7	6	116.7%
Nuwara Eliya	108.7	71.5	152.0%	13	8	162.5%
Poothuvil	188.6	75.7	249.1%	12	na	
Puttlam	70.1	67.7	103.5%	6	5	120.0%
Rathmalana	206.0	141.5	145.6%	15	9	166.7%
Rathnapura	308.8	212.2	145.5%	18	14	128.6%
Trincomalee	17.9	55.5	32.3%	5	4	125.0%
Vavuniya	11.8	62.9	18.8%	6	4	150.0%
Mattala	86.9			12		

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

Table-02-Monthly Total Rainfall (mm) with 30 years (1961-1990) of averages at Hydro catchment areas during March 2021

Hydro Catchment	March2021	Average	% (Percentage of average)
Castlereigh	239.6	96.6	248.0%
Norton	**293.7**	**123.1**	**238.5%**
Maussakele	**259.5**	**126.4**	**205.4%**
Canyon	**221.3**	**121.0**	**182.9%**
Laksapana	**328.7**	**144.9**	**226.9%**
Kotmale	**100.4**	**41.4**	**242.7%**
Victoriya	**137.6**	**41.0**	**335.9%**
Randenigala	**79.7**	**48.4**	**164.6%**
Bowatenna	**60.7**	**120.4**	**50.4%**
Ukuwela	**137.9**	**40.4**	**341.2%**
SamanalaWewa	**177.5**	**129.0**	**137.6%**
Maskeliya	**276.5**	**177.5**	**155.8%**

Table 3(a) - Extremes of Maximum Temperatures March 2021				
	Maximum			
	Value	Offsets		Highest Std.Div
		(-)	(+)	
Value	37.1	6.7	5	1.85
Station	Ratnapura	Badulla	Trincomalee	Polonnaruwa
Date	04/03/2021	10/03/2021	31/03/2021	
Table 1(b) -Extremes of Minimum Temperature March 2021				
	Minimum			
	Value	Offsets		Highest Std.Div
		(-)	(+)	
Value	5.6	5.6	4.1	2.51
Station	NuwaraEliya	Badulla	NuwaraEliya	NuwaraEliya
Date	02/03/2021	02/03/2021	23 & 25 /03/2021	

Prepared by National Meteorological Centre (NMC)
Department of Meteorology