Weather Synopsis –March 2020.

Significantly below normal rainfalls were received over most parts of the island with the large-scale subsidence evident over Sri Lanka region (Figs 1, 2, 3, and 7). All meteorological stations reported below normal rainfalls. Most of hydro catchment areas reported significantly below normal rainfalls except Randenigala, Kothmale and Samanalawewa where about near normal rainfall were observed (Fig 2). Mean maximum and mean minimum temperatures were 1.0-2.5^{0}C above average over most parts of the island for March (Figs 11 and 12).

Mainly fair weather prevailed during most of the month except for a few afternoon or evening thundershowers reported from Southern parts of the island. Fairly heavy showers with thunder were reported from Western half of the country on 06th, South-western parts on 16th, 17th, 20th and 30th and thunder showers were also reported several places from eastern and Uva provinces on 17th .

Highest monthly rainfall was reported from Deniyaya and it was 229.5mm.The recorded maximum daily rainfall during month of March was 109 mm at Deniyaya on 30th th . It is worthy to mentioned that due to COVID 19 pandemic , there are missing data from 30% of rain guage stations.

The recorded maximum temperature was 38.0 ^{0}C on 18th at Kurunegala, while recorded minimum temperature was 7.5^{0}C on 27th at NuwaraEliya.

Warner ENSO neutral conditions were observed during Month of March 2020. Ocean Nino Index is around 0.6 and 0.5 during January to March and February to April respectively (NOAA Climate prediction Center). Sea surface waters in tropical Indian Ocean and in the tropical Pacific near to and west of the Date Line are warmer than average (Fig. 4) and IOD neutral conditions were observed during Month of March 2020

The Madden-Julian Oscillation (MJO) was at the phase 4 in Maritime Continent during 1st week and propagated eastward to the phase 5 in thewestern Pacific Ocean during 2nd week , then become weak from 14th to 17th March, enter to phase 2 and 3 in from 18th to 25th , propagated to phase 4 during last few days of March (Fig 5).

During the month, the Inter Tropical Convergence Zone lay between 10^{0}S and 12^{0}S from 40^{0}E to 70^{0}E ,and between 06^{0}S and 10^{0}S from 70^{0}E to 120^{0}E (Fig 6) with fluctuation to north of average position from 20th to 24th, and south of the average position from 26th to 29th.

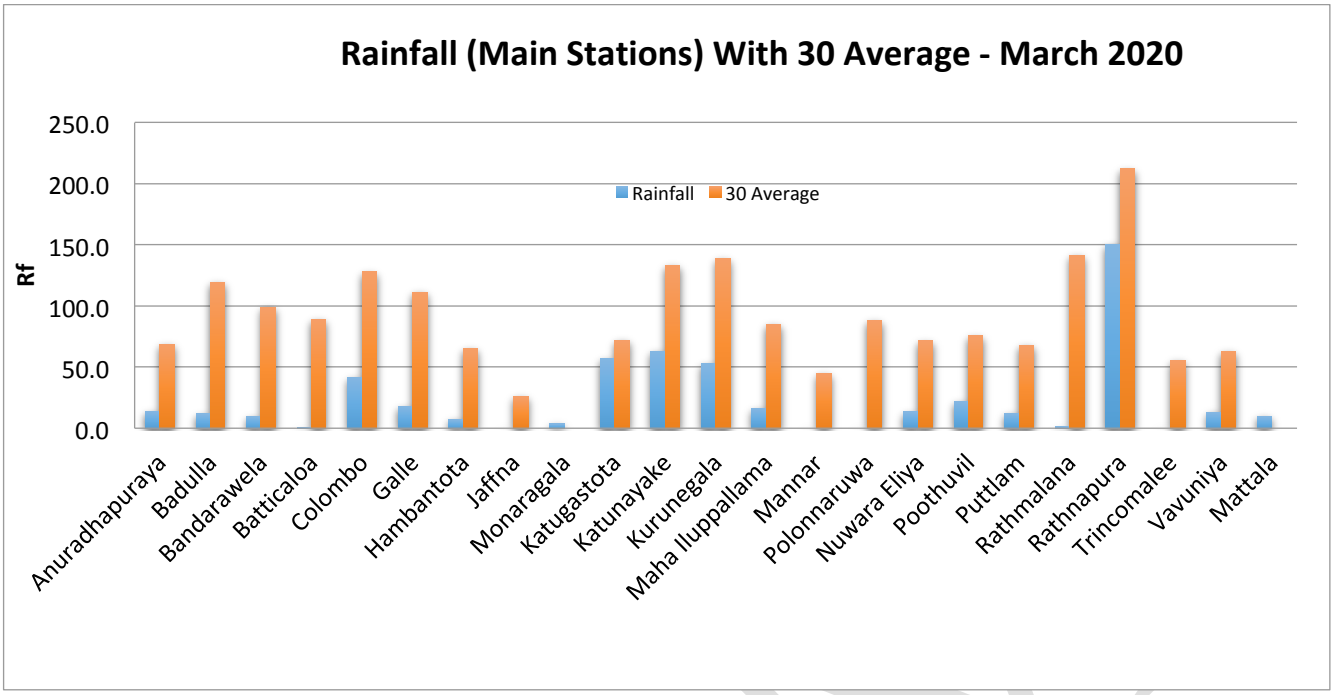

Fig 1 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during March 2020

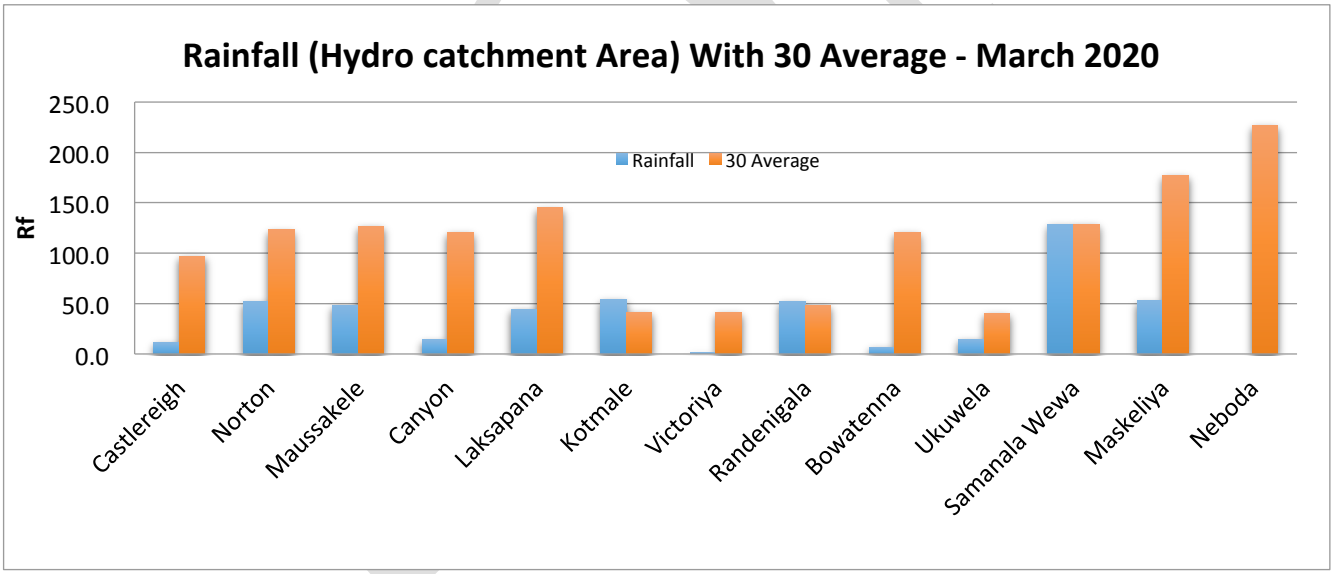

Fig 2 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at **at Hydro catchment areas** during March 2020

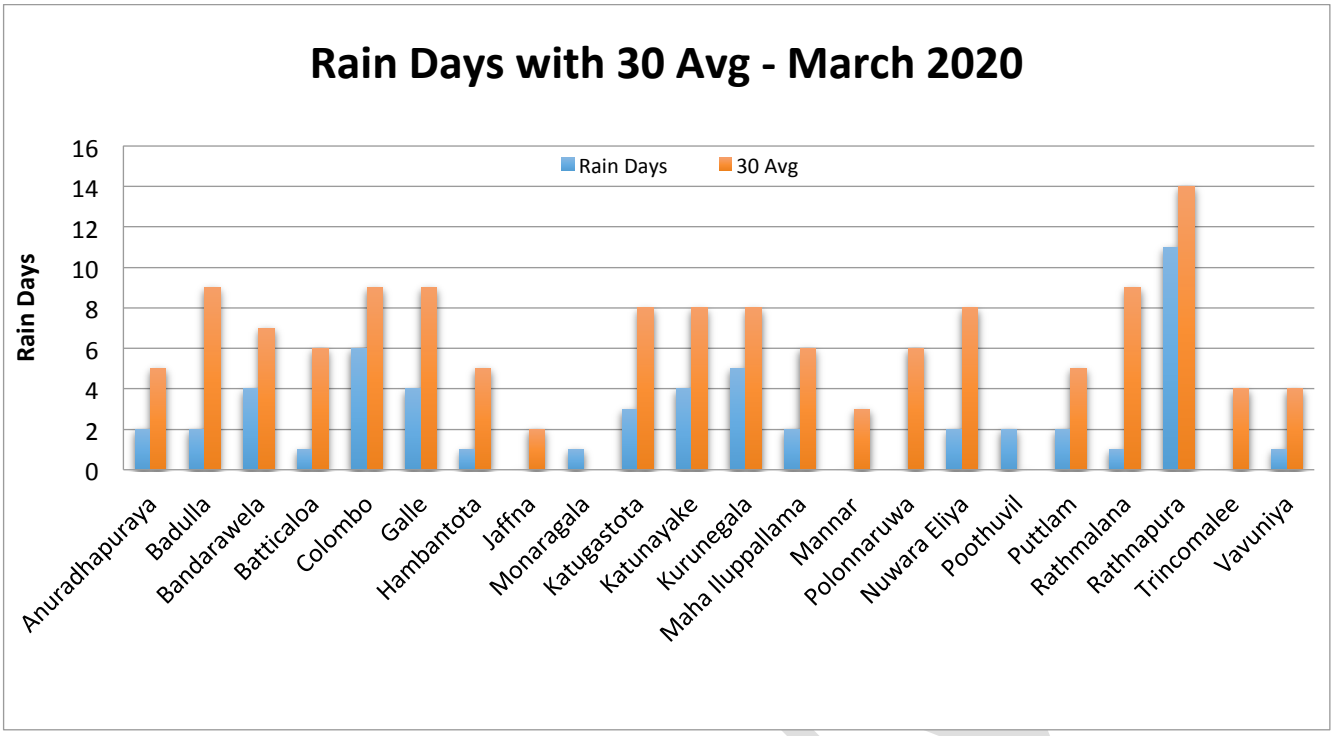

Fig 3 monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during March 2020

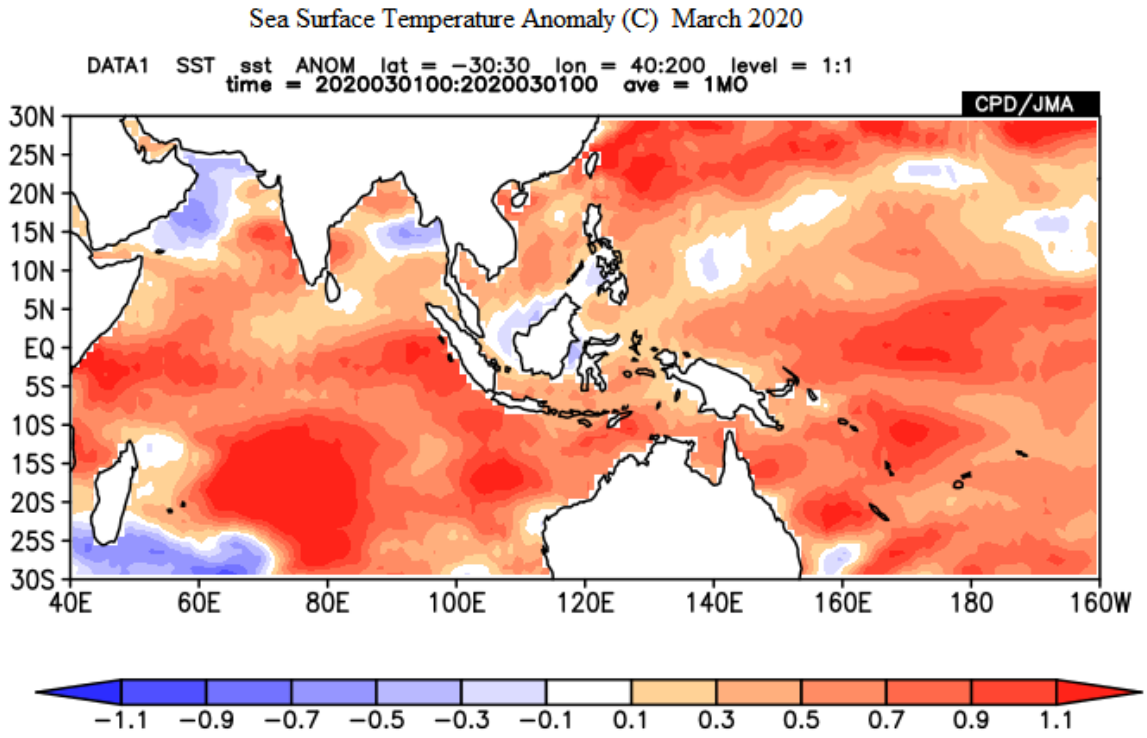

Fig 4 : Sea Surface Temperature anomaly for March 2020

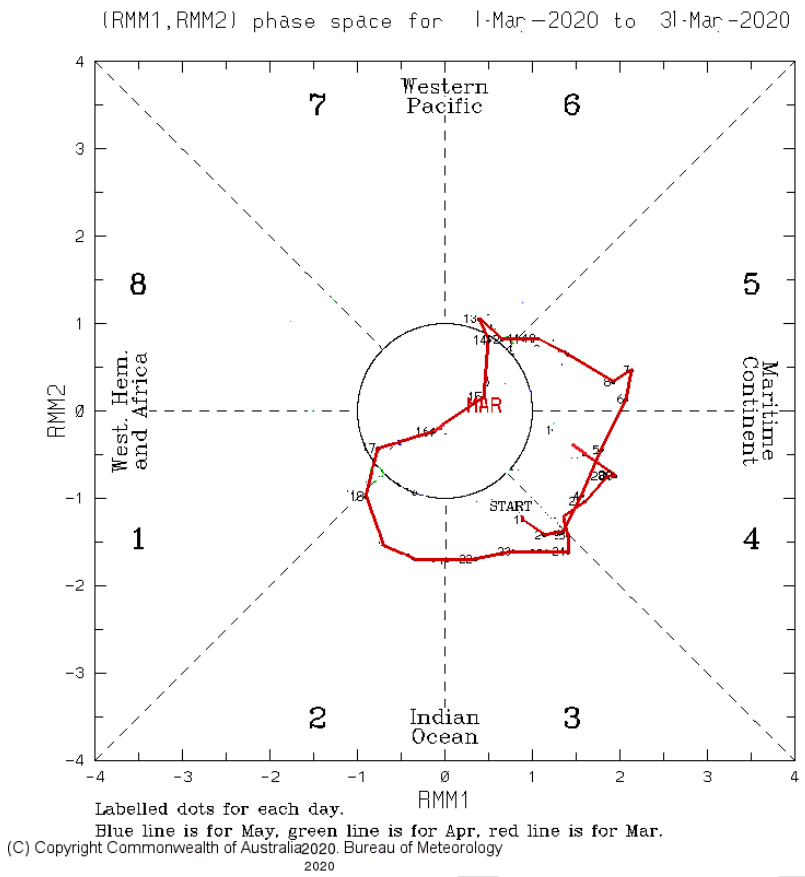

Fig 5 : MJO Phase diagram

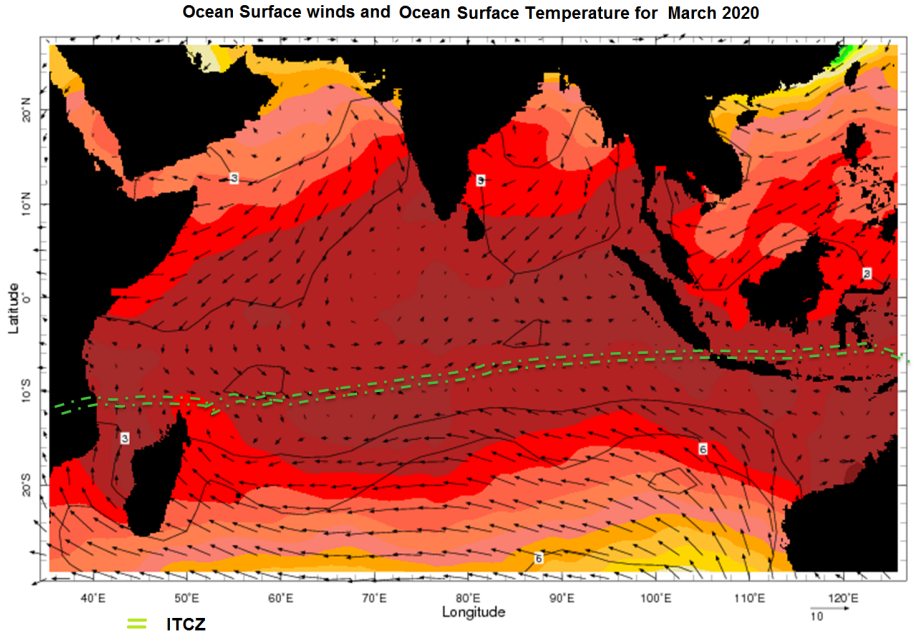

Fig 6 : Ocean Surface Winds and Ocean Surface Temperature for March 2020

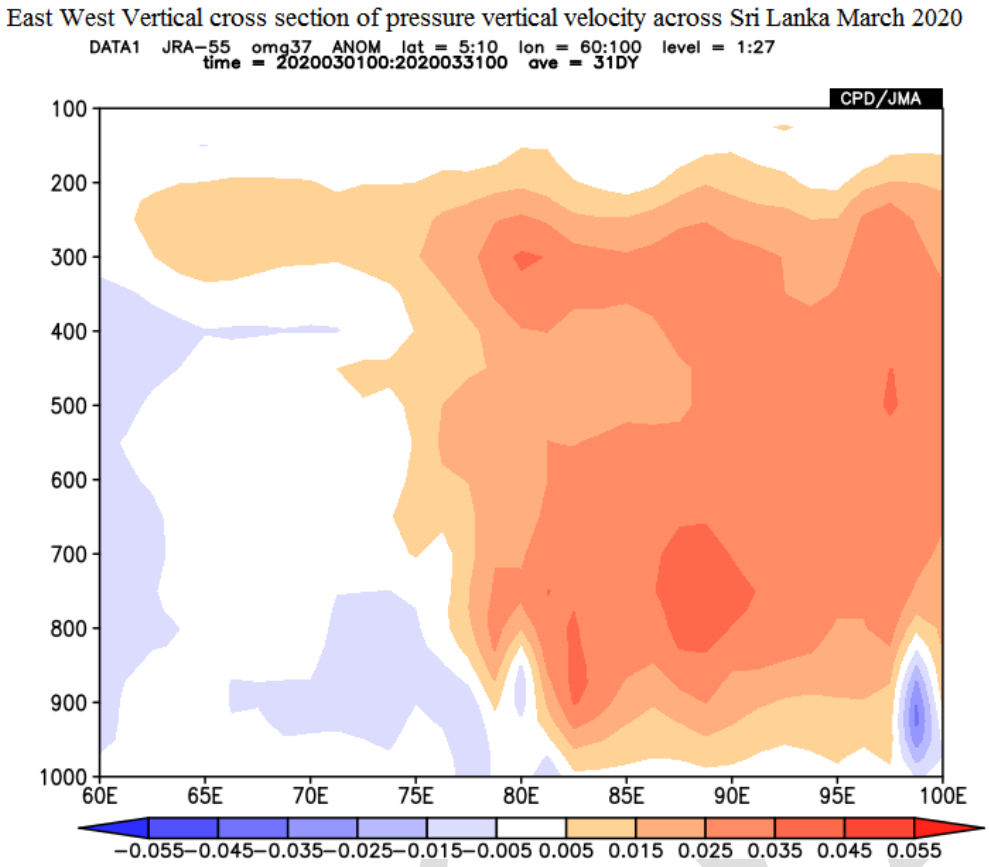

Fig 7 : Vertical cross-section of Pressure vertical wind anomaly for March 2020 (JRA55).

Weather Systems:

In the south Indian ocean a tropical disturbance developed in Southwest Indian Ocean near 13.2^{0}S and 51.9^{0}E on 12 March 2020. It was developed in to a low pressure area on 13, then in to a depression on 14th and further intensify into a tropical cyclone Herold on 15th, Initially it moved southwestward then southeastward and dissipated on 20th.

Surface pressure and winds: The surface pressure was about or above average except on 9th, 10th, 14th, 15th, 25th, 26th , 29th and 30th March, when below average surface pressure values observed. Pressure distribution was fairly even or even. Mild pressure gradient was observed on 17th March . The surface wind was predominantly calm/05kts and variable or NE in direction .

Upper winds:

At 850hPa, North-easterly wind flow is dominated over the island. Averaged ridge axis was positioned from 27^{0}N40^{0}E, 20^{0}N55^{0}E, 15^{0}N75^{0}E, 18^{0}N85^{0}E, 15^{0}N100^{0}E, 20^{0}N120^{0}E. Anomalous anticyclone appeared north of Sri Lanka may have played a role in below normal monthly rainfall for March 2020 .

At 700 hPa, North-easterly wind flow originated from anticyclonic circulation centred at Karnataka, India, is dominated over the island. Averaged ridge axis was positioned from 08^0N50^0E, 13^0N75^0E, 13^0N100^0E, , and 13^0N120^0E.

At 500 hPa, easterly wind flow dominated during the month. Averaged ridge axis was positioned over Sri Lanka from 11^0N40^0E, 08^0N75^0E, 08^0N85^0E, and 13^0N120^0E.

The 200 hpa the upper tropospheric ridge was laid around 07^0N bringing predominantly southeasterly to southwesterly winds across Sri Lanka.

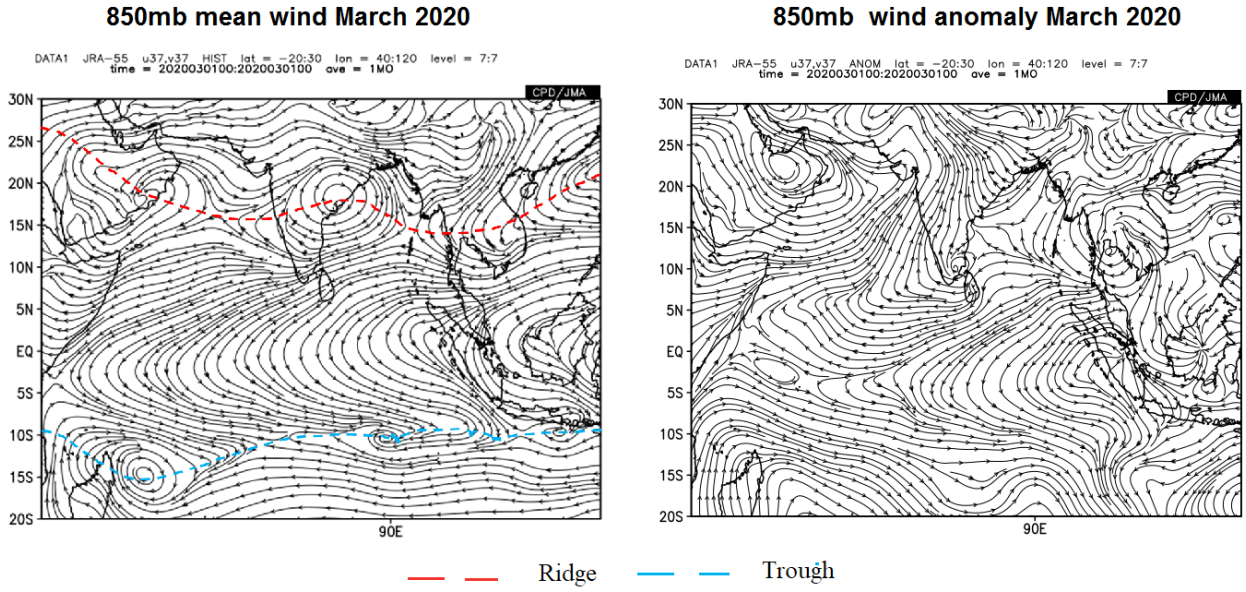

Fig 8 Monthly average wind pattern at 850hpa level during the month of March 2020 (JRA55)

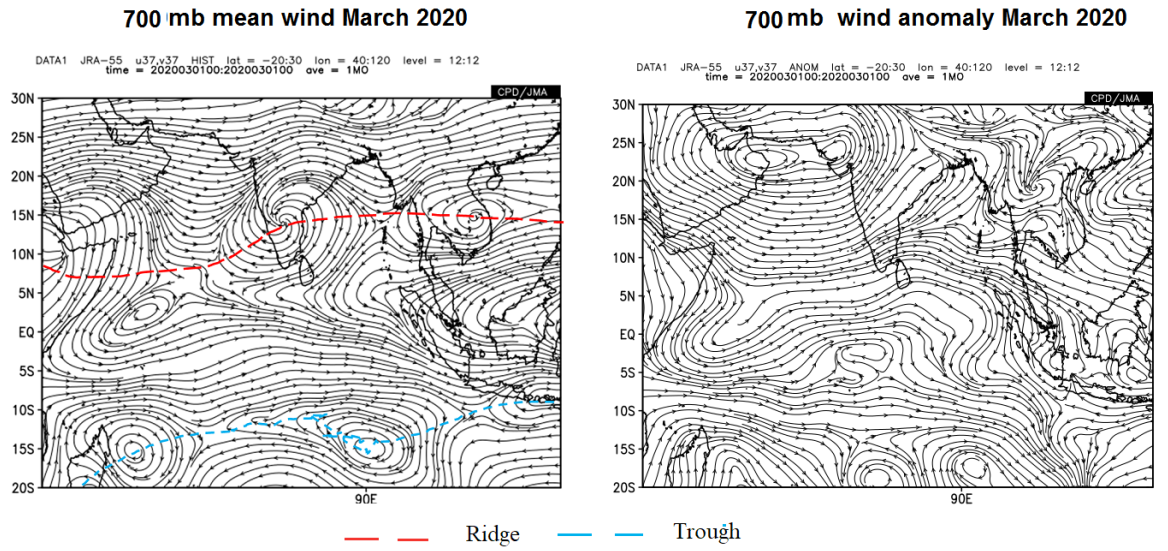

Fig 9 : Monthly average wind pattern at 700hpa level during the month of March 2020(JRA55)

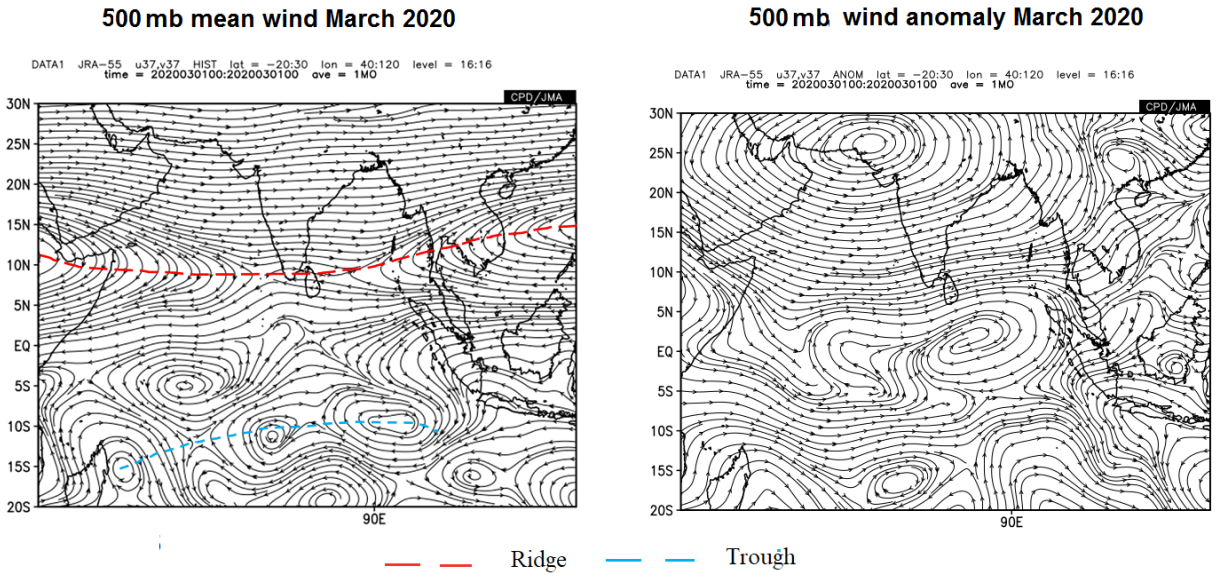

Fig.10: Monthly average wind pattern at 500hpa level during the month of March 2020 (JRA55)

Temperature Field:

The maximum temperatures in the day were mostly 1-3^{0}C above normal in most places during the month. Galle. Katugastota, Kurunegala and Puttatlum stations reported 2-4 above normal day temperatures most of the time. It was below normal over some stations during 12-13th and 21st to 23rd. Highest recorded maximum temperature for the month of March 2020 was 38^{0}C from Kurunegala on 18.

Night minimum temperatures over most parts were about or 1-2^{0}C above normal during the month Colombo, and Ratmalana stations reported 2-4 above normal day temperatures most of the time. 3-5^{0}C degrees above normal night temperatures were reported from NuwaraEliya 17th -20th**.** Lowest recorded minimum temperature for the month of March 2020 was 7.5^{0}C from NuwaraEliya on 27. At Badulla night temperatures were around 2-3^{0}C degrees below normal during 3-4, 13-14th and 27th .

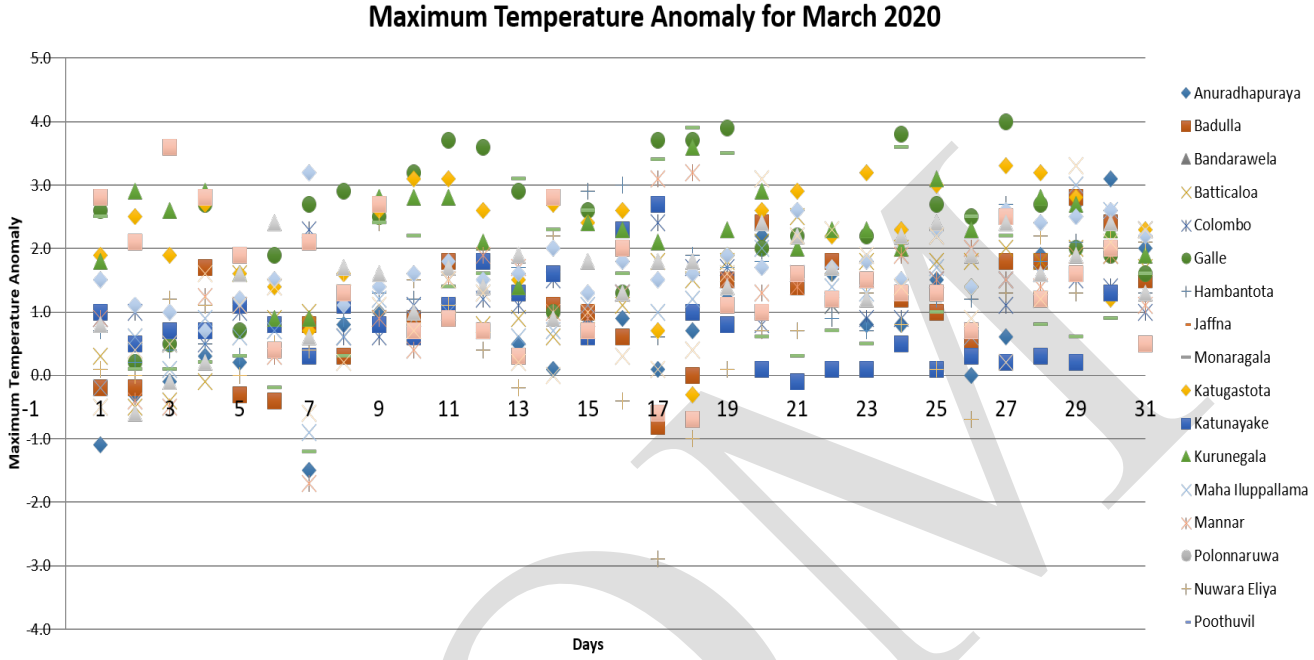

Fig 11 Maximum Temperature anomaly (^{0}C) for March 2020

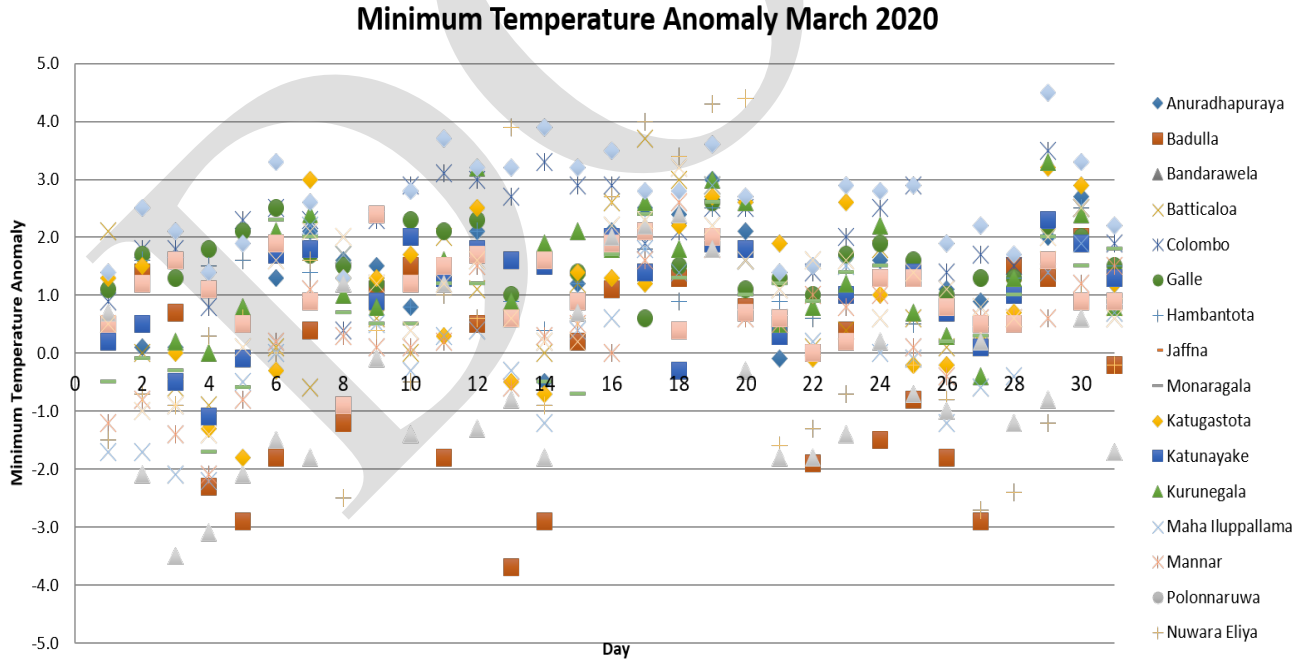

Fig 12 Minimum Temperature anomaly (^{0}C) for March 2020

Maximum and Minimum departures from normal day/night temperature were shown in table 1.

Rainfall: Significantly below normal rainfalls were received over most parts of the island (Fig 1) due to large scale subsidence occurred in the vicinity of Sri Lanka (Fig 7). Highest monthly rainfall was reported from Deniyaya and it was 229.5mm.The recorded maximum daily rainfall during month of March was 109 mm at Deniyaya on 30th . It is worthy to mention that due to COVID 19 pandemic, there are missing data from 30% of rain guage stations.

The table 2 and the figures 1 and 3 show the total rainfall and the number of rain days at the principal meteorological stations recorded in the month against the respective averages. The rainfall during the month was exceptionally below average at all meteorological stations. Number of rain days was also reported below average. Maximum percentage was reported from Katugastota (79.1%). No rain has been reported from Jaffna, Mannar, Polonnaruwa and Trincomalee meteorological stations. Number of rainy days was below normal. Well below average rainfalls were reported from all catchment areas except Kotmale where above average rainfall was reported and Randenigala and Samanalwewa where about normal rainfalls were reported.

Table 1(a) - Extremes of Maximum Temperatures March 2020

	Maximum			
		Offsets		Highest
	Value	(-)	(+)	Std.Div
Value	**38**	-2.9	4	1.11
Station	**Kurunegala**	NuwaraEliya	Galle	NuwaraEliya
Date	18/03/2020	17/03/2020	27/03/2020	

Table 1(b) -Extremes of Minimum Temperature March 2020

	Minimum			
		Offsets		Highest
	Value	(-)	(+)	Std.Div
Value	7.5	3.7	4.5	2.04
Station	NuwaraEliya	Badulla	Ratmalana	NuwaraEliya
Date	27/03/2020	13/03/2020	29/03/2020	

Table-02-Monthly Total Rainfall (mm) and monthly total no of rainy days with 30 years(1961-1990) of their averages at main Meteorological stations during March 2020

Meteorological station	Monthly Total rainfall (mm)			Monthly Total No of rainy Days		
	2020-March	Average	%	2020-March	Average	%
Anuradhapuraya	13.7	68.7	19.9%	2	5	40%
Badulla	11.7	119.4	9.8%	2	9	22%
Bandarawela	9.4	98.5	9.5%	4	7	57%
Batticaloa	0.7	89.0	0.8%	1	6	17%
Colombo	41.3	128.0	32.3%	6	9	67%
Galle	17.7	111.3	15.9%	4	9	44%
Hambantota	7.0	65.4	10.7%	1	5	20%
Jaffna	0.0	25.7	0.0%	0	2	0%
Katugastota	56.9	71.9	79.1%	3	8	38%
Katunayake	63.0	132.9	47.4%	4	8	50%
Kurunegala	52.7	139.1	37.9%	5	8	63%
Mahalluppallama	16.2	84.9	19.1%	2	6	33%

Mannar	0.0	44.4	0.0%	0	3	0%
Polonnaruwa	0.0	87.9	0.0%	0	6	0%
NuwaraEliya	13.3	71.5	18.6%	2	8	25%
Poothuvil	22.0	75.7	29.1%	2	na	#VALUE!
Puttlam	12.1	67.7	17.9%	2	5	40
Rathmalana	1.2	141.5	0.8%	1	9	11
Rathnapura	150.1	212.2	70.7%	11	14	79
Trincomalee	0.0	55.5	0.0%	0	4	0
Vavuniya	12.9	62.9	20.5%	1	4	25

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

Table-03-Monthly Total Rainfall (mm) with 30 years (1961-1990) of averages at Hydro catchment areas during March 2020

Hydro Catchment	March 2020	Average	% (Percentage of average)
Castlereigh	**11.2**	96.6	11.6%
Norton	**51.7**	123.1	42.0%
Maussakele	**48.0**	126.4	38.0%
Canyon	**14.0**	121.0	11.6%
Laksapana	**44.6**	144.9	30.8%
Kotmale	**54.3**	41.4	131.2%
Victoriya	**1.2**	41.0	2.9%
Randenigala	**51.9**	48.4	107.2%
Bowatenna	**6.8**	120.4	5.6%
Ukuwela	**14.5**	40.4	35.9%
SamanalaWewa	**128.0**	129.0	99.3%
Maskeliya	**52.6**	177.5	29.6%

Prepared by National Meteorological Centre(NMC)
Department of Meteorology