

Weather Synopsis –January 2020.

Northeast monsoon conditions prevailed throughout the month. Below normal rainfalls were received over most parts of the island due to large-scale subsidence evident over Sri Lanka region (Fig 12). Most of meteorological stations except Colombo, Ratmalana and Ratnapura as well as hydro catchment areas reported exceptionally below normal rainfalls (Figs 1, and 2). But the much expected seasonal cold weather was not eminent during the month. Mean maximum and mean minimum temperatures were 1.0-2.5⁰C above average over most parts of the island for January (Figs 13 and 14).

Isolated heavy falls were reported from 1st to 2nd January with 94.0 mm from Padukka Estate on 1st January and 112.3 mm from Colombo on 02nd. Another rainy spell over South eastern parts was evident on 11 and 12th January with 138.3 from Panama Tank on 12th January.

With the propagation of equatorial Rossby wave in the vicinity of Sri Lanka (Fig 8), widespread rainy spell occurred from 19th to 22nd for January 2020. Heavy falls of 127.5 mm, 126.5mm and 111.3 mm were reported from Rantambe, Randenigala and Panama tank respectively on 22nd January (Fig 4). Northcentral, central and southeastern parts received more than 70% of January 2020 monthly total rainfall during this period (Fig 4)

ENSO and IOD neutral conditions were observed during Month of January 2020. However, 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. 5)

The Madden-Julian Oscillation (MJO) was weak over Indian Ocean during 1st week and propagated eastward to the phase 4 Maritime Continent 06th and then to phase 5 to 7 the western and central Pacific Ocean from 11th to 24th (Fig 6).

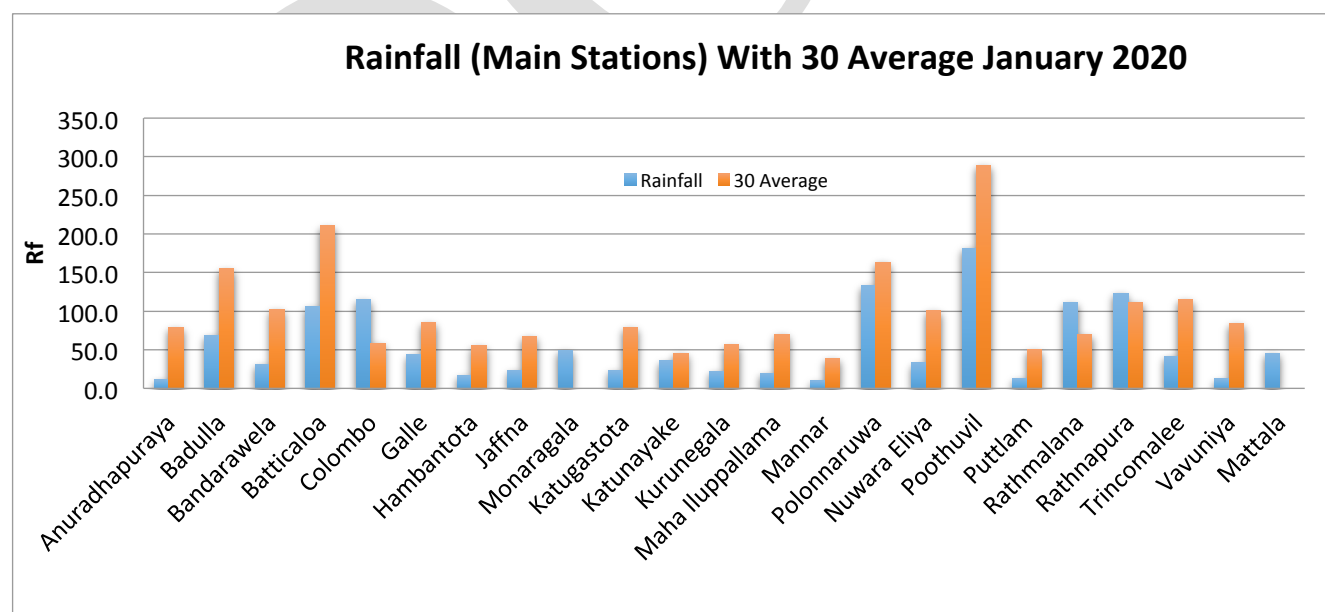


Fig 1 Monthly Total Rainfall (mm) with 30 years (1961-1990) of their averages at Main Meteorological stations areas during January 2020

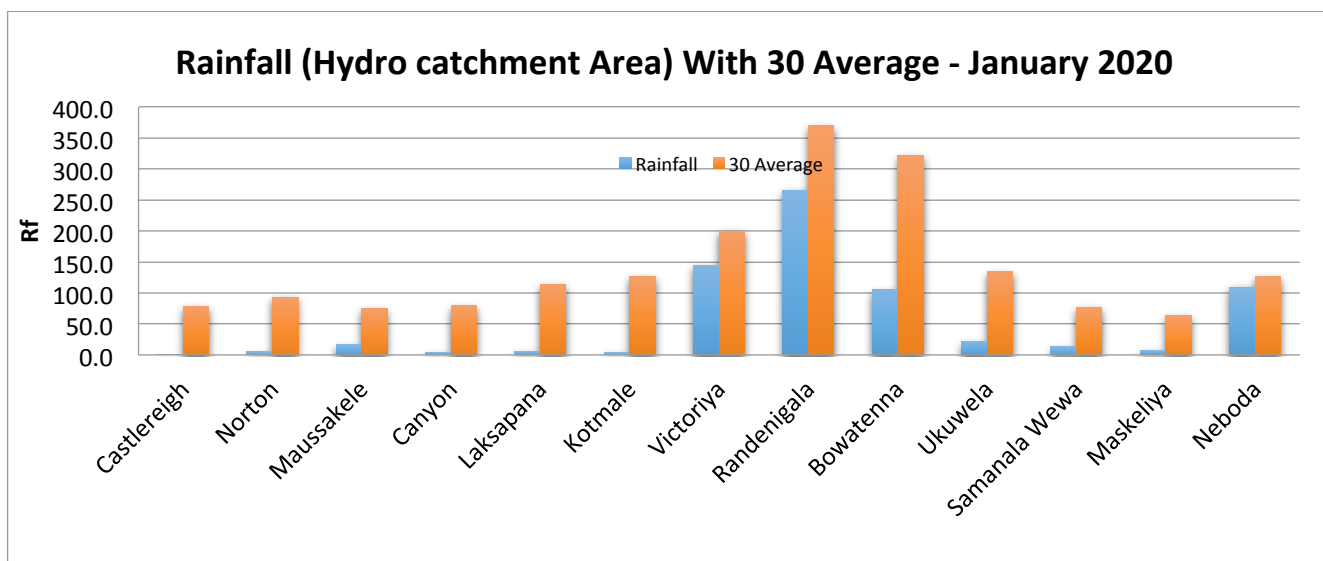


Fig 2 Monthly Total Rainfall(mm) with 30 years (1961-1990) of their averages at **at Hydro catchment areas** during January 2020

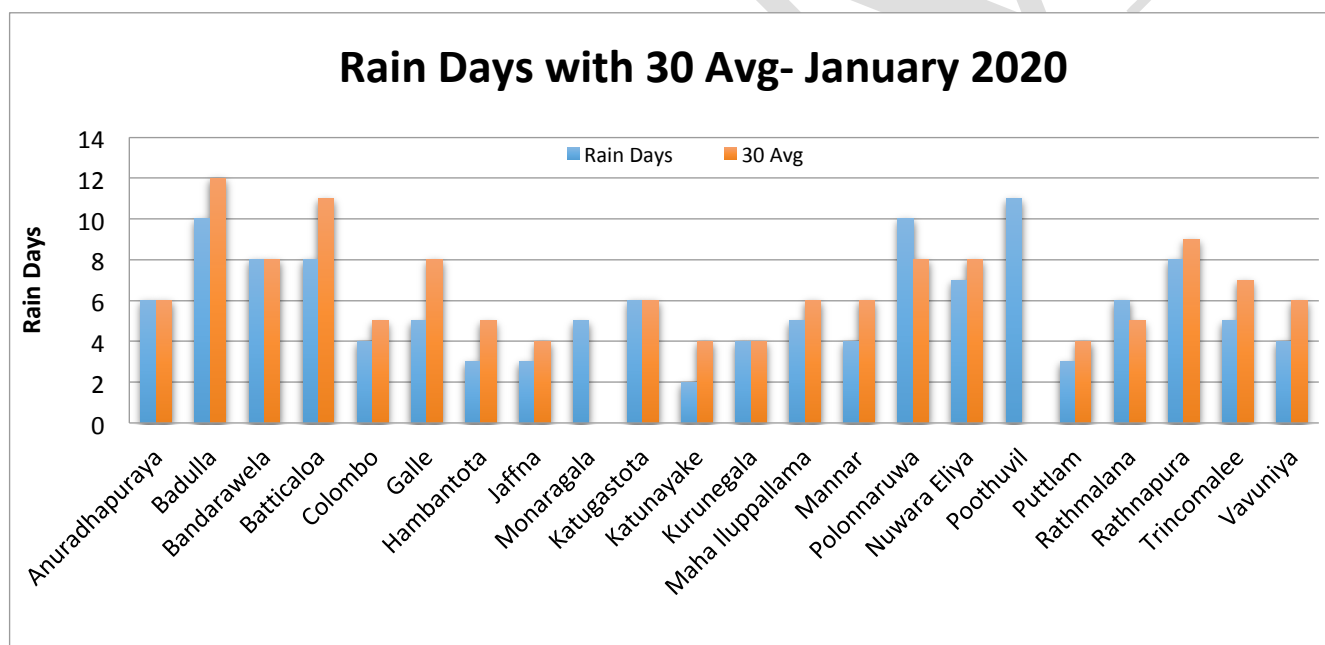


Fig 3 monthly total no of rainy days with 30 years (1961-1990) of their averages at main Meteorological stations during

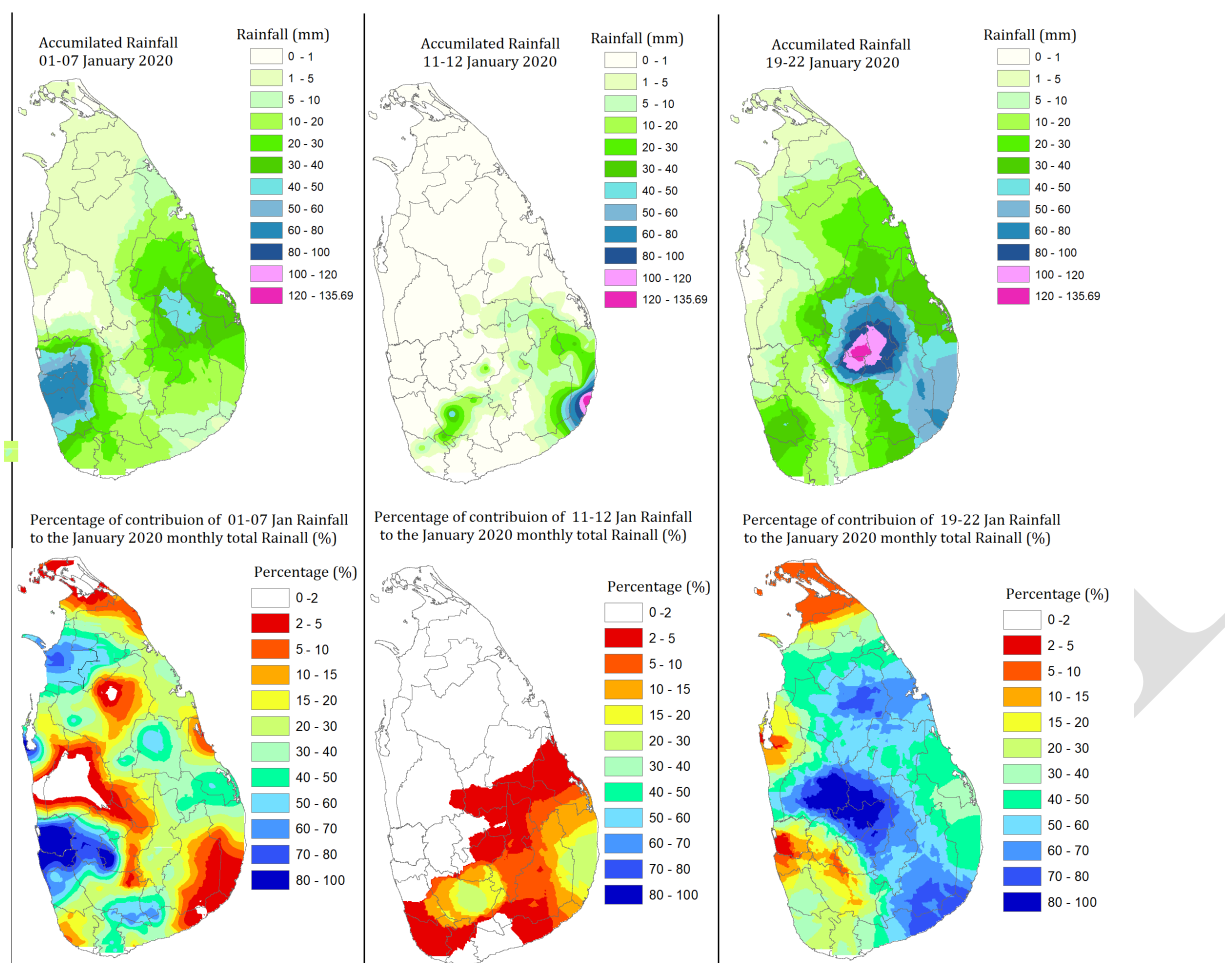


Fig 4 : Rainfall amount receive during 3 rainy spells (January 1-7, January 11-12 and January 19-22) and it's contribution to monthly total rainfall of January 2020 as a percentage (%).

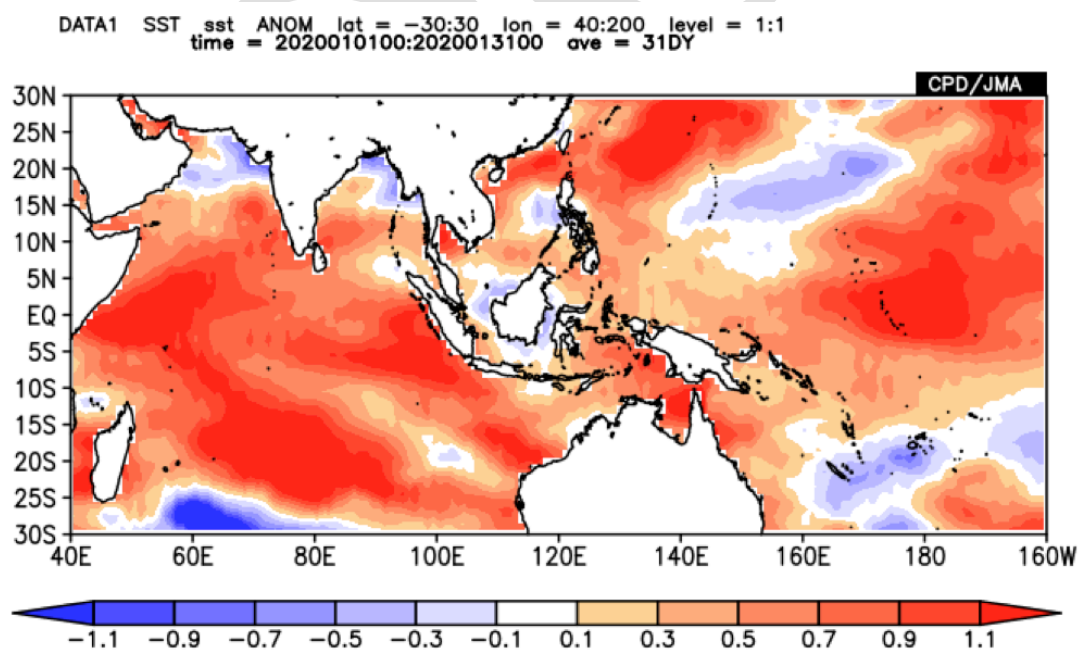


Fig 5 : Sea Surface Temperature anomaly for January 2020

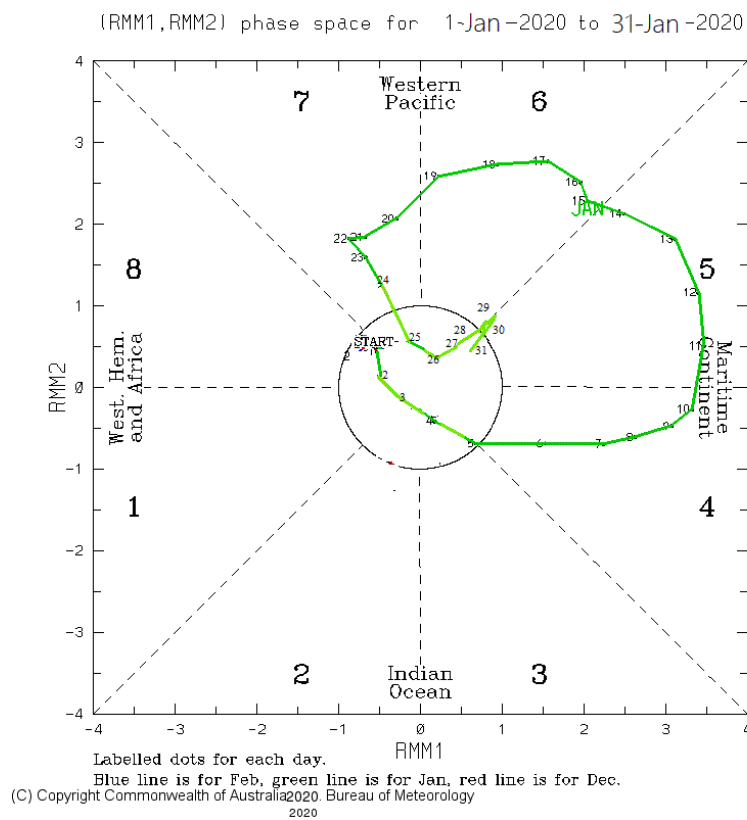


Fig 6 MJO Phase Diagram

Ocean Surface winds and Ocean Surface Temperature for January 2020

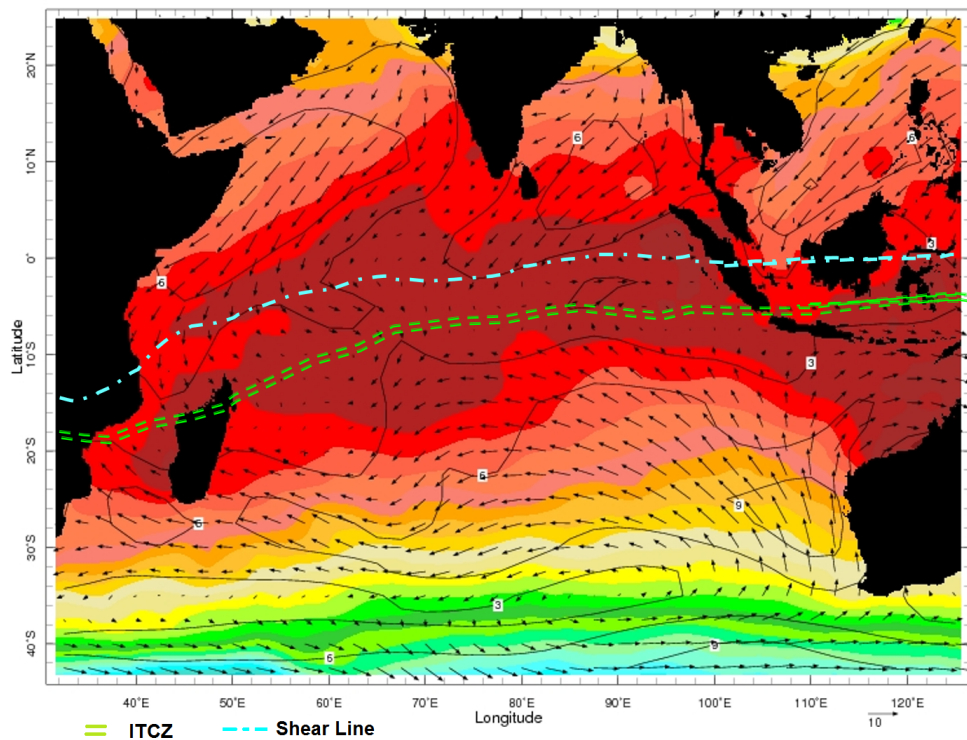


Fig 7 : Ocean Surface Winds and Ocean Surface Temperature for January 2020

During the month, the average position of Inter Tropical Convergence Zone was around $18^{\circ}\text{S}40^{\circ}\text{E}$, $10^{\circ}\text{S}60^{\circ}\text{E}$ and $04^{\circ}\text{S}80^{\circ}\text{E}$ and $04^{\circ}\text{S}120^{\circ}\text{E}$ while the shear line was around $08^{\circ}\text{S}40^{\circ}\text{E}$, $02^{\circ}\text{S}60^{\circ}\text{E}$, $02^{\circ}\text{S}70^{\circ}\text{E}$, $01^{\circ}\text{S}90^{\circ}\text{E}$ and Equator 120°E (Fig 7). ITCZ fluctuated north of average position at the beginning of the month up to 10^{th} , then south of the average position from 11^{th} to 24^{th} , again north of average position for the remaining days of the month.

Weather systems:

In the south Indian Ocean there were two tropical disturbances. A Moderate Tropical Storm Diane originate near Mauritius by on 24 January moved southeastward and weakened on 26^{th} as the system entered to a region with strong vertical wind shear.

Tropical Cyclone Esami formed on January 24^{th} about 1200 km to east-southeast of Mauritius and moved south southeastward before weakened to a depression on 26^{th} and dissipated thereafter.

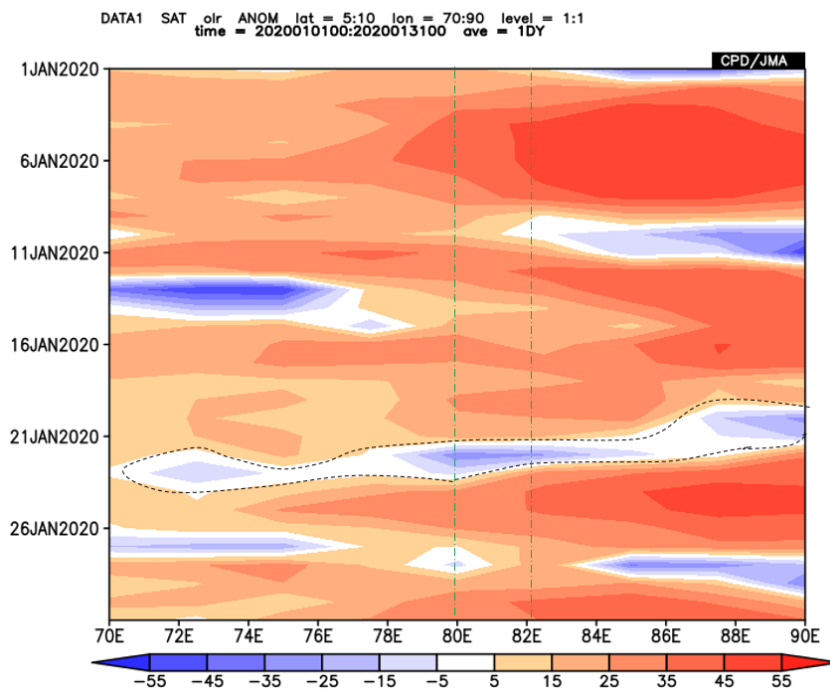


Fig 8 Time Longitude cross-section of OLR over Sri Lanka

Pressure and wind field: Over the island, pressure values were above or about average except for a few days from 14^{th} to 20^{th} January when below average pressure values were reported. Mild Northeasterly pressure gradient was report on 03^{rd} , 06^{th} , 08^{th} , 12^{th} , 13^{th} , 18^{th} , from 22^{nd} to 24^{th} and 26^{th} to 27^{th} while the distribution was either even or fairly even during rest of the days.

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

Upper winds:

At 850hPa, North-easterly wind flow originated from anticyclonic circulation at central India, was dominated over the island. Averaged ridge axis was positioned from 18°N40°E, 20°N50°E, 18°N80°E 16°N100°E and 22°N120°E. The anomalous anticyclonic circulation to the northeast of Sri Lanka and it's associated northeast southwest oriented trough which lay over northern part of the island may have played a role in below normal monthly rainfall for January 2020 (Fig 9)

At 700 hPa, North-easterly wind flow originated from anticyclonic circulation at south India, was dominated over the island. Averaged ridge axis was positioned from 10°N40°E, 12°N85°E, and 14°N120°E. Anomalous anticyclone appeared over Sri Lanka may caused deficit rainfall for January 2020 (Fig 10).

At 500 hPa, easterly wind flow dominated during the month. Averaged ridge axis was positioned closer to north of Sri Lanka from 12°N40°E, 12°N60°E, 10°N100°E, and 12°N120°E (Fig 11).

The 200 hpa the upper tropospheric ridge was laid around 08°N bringing predominantly southeasterly to southwesterly winds across Sri Lanka.

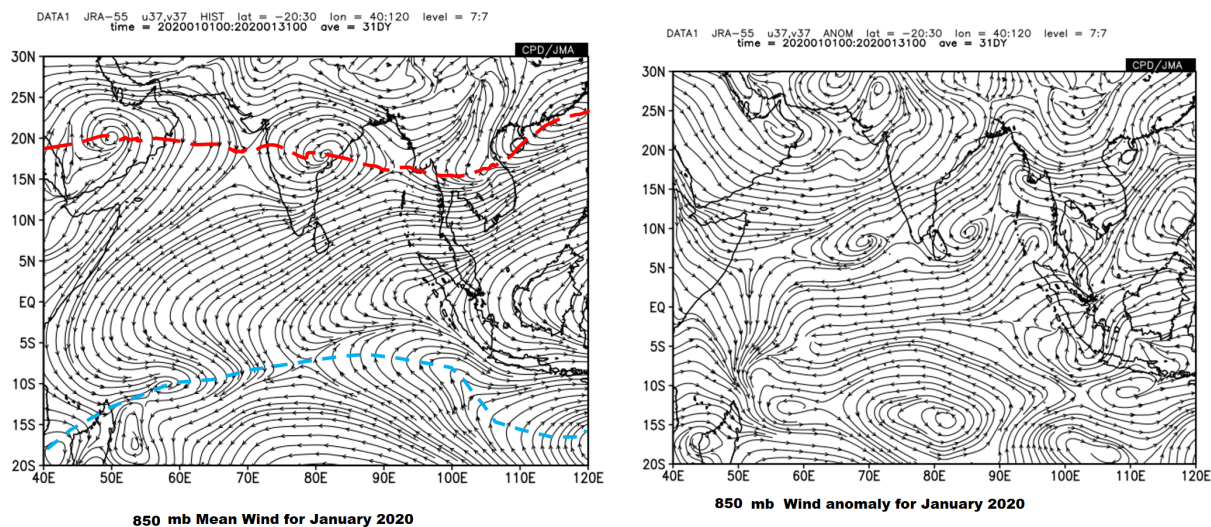


Fig 9 Monthly average wind pattern at 850hpa level during the month of January 2020 (JRA55)

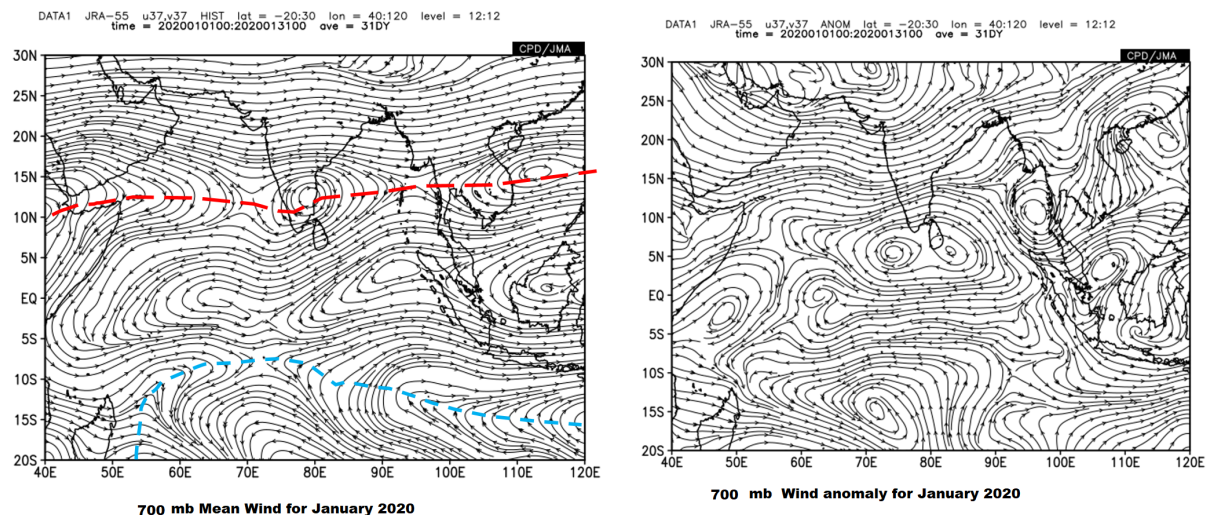


Fig 10 Monthly average wind pattern at 700hpa level during the month of January 2020 (JRA55)

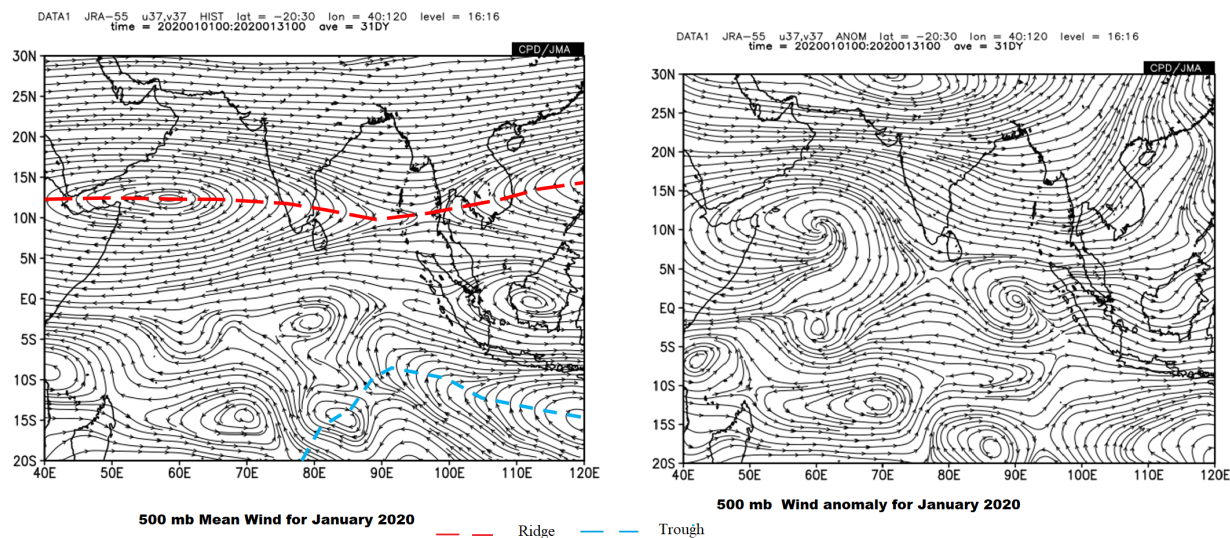


Fig 11 : Monthly average wind pattern at 500hpa level during the month of January 2020 (JRA55)

East West Vertical cross section of pressure vertical velocity across Sri Lanka January 2020

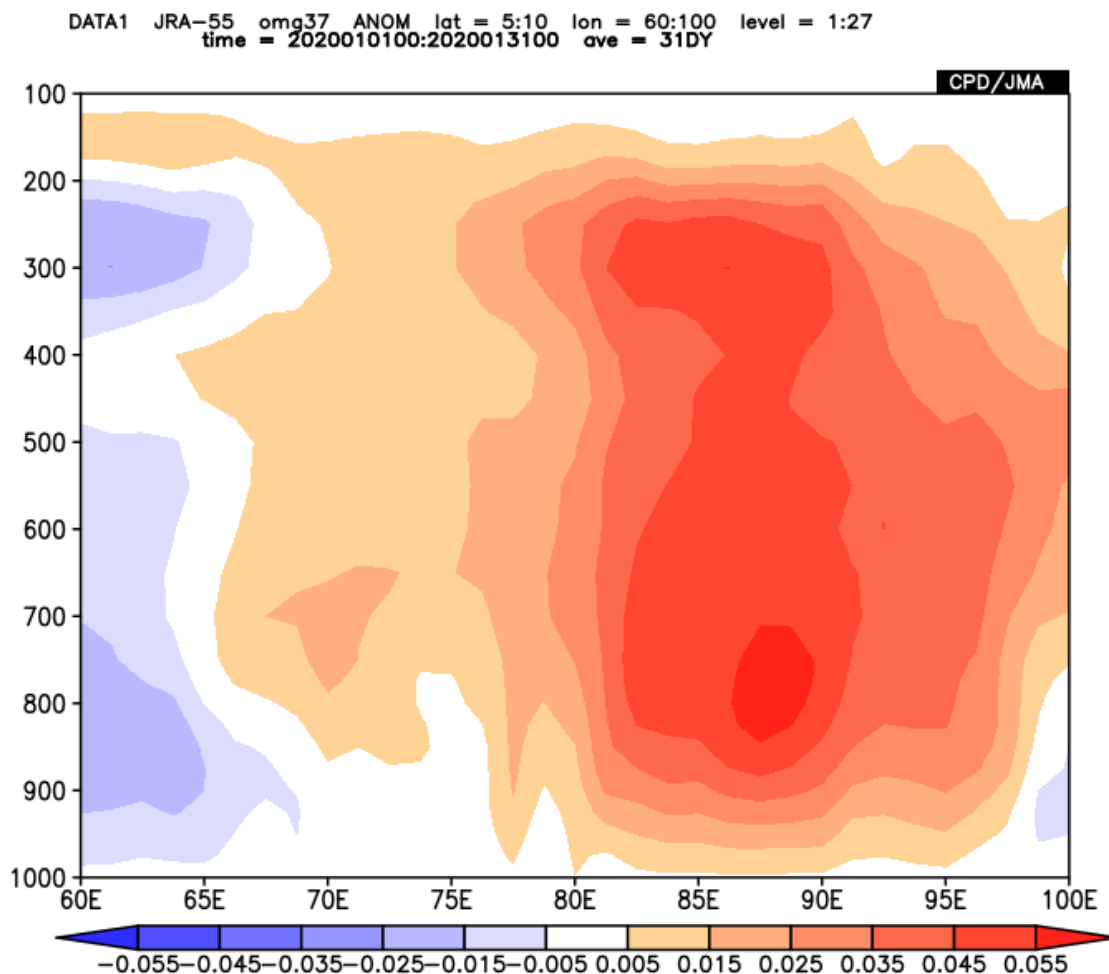


Fig 12 : Vertical cross-section of Pressure vertical wind anomaly for March 2020 (JRA55).

Temperature Field:

The maximum temperatures in the day were mostly 1-3⁰C above normal in most places during the month. Highest recorded maximum temperature for the month of January 2020 was 35.6⁰C from Kurunegala on 19. At Galle day temperatures were 4⁰C degrees above normal on 1st, 3rd, 6th -8th and 23rd to 24th

Night minimum temperatures over most parts were about or 1-2⁰C above normal during the month except 14 to 16th when it was about or 1-3⁰C below normal. Lowest recorded minimum temperature for the month of January 2020 was 4.5⁰C from Nuwara Eliya on 10th. Night temperature were 4⁰C above average at Nuwara Eliya from 20th to 24th.

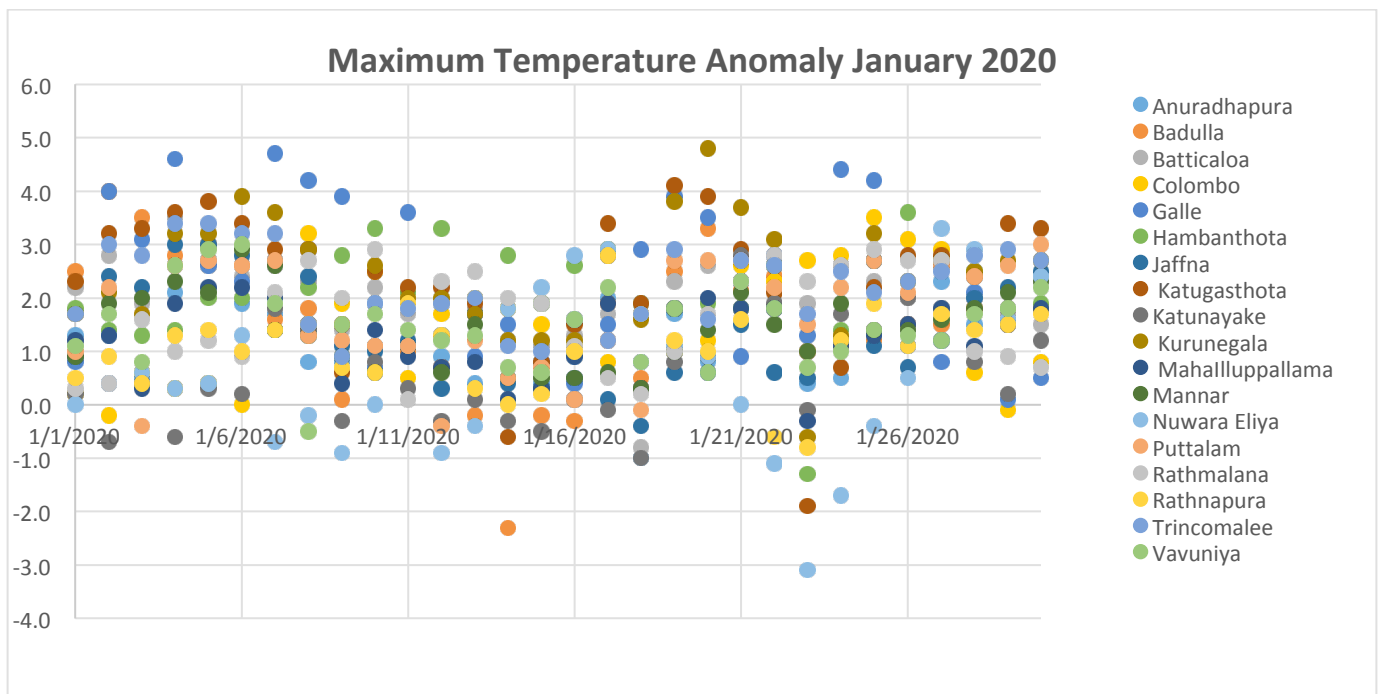


Fig 13 Maximum Temperature anomaly ($^{\circ}\text{C}$) for January 2020

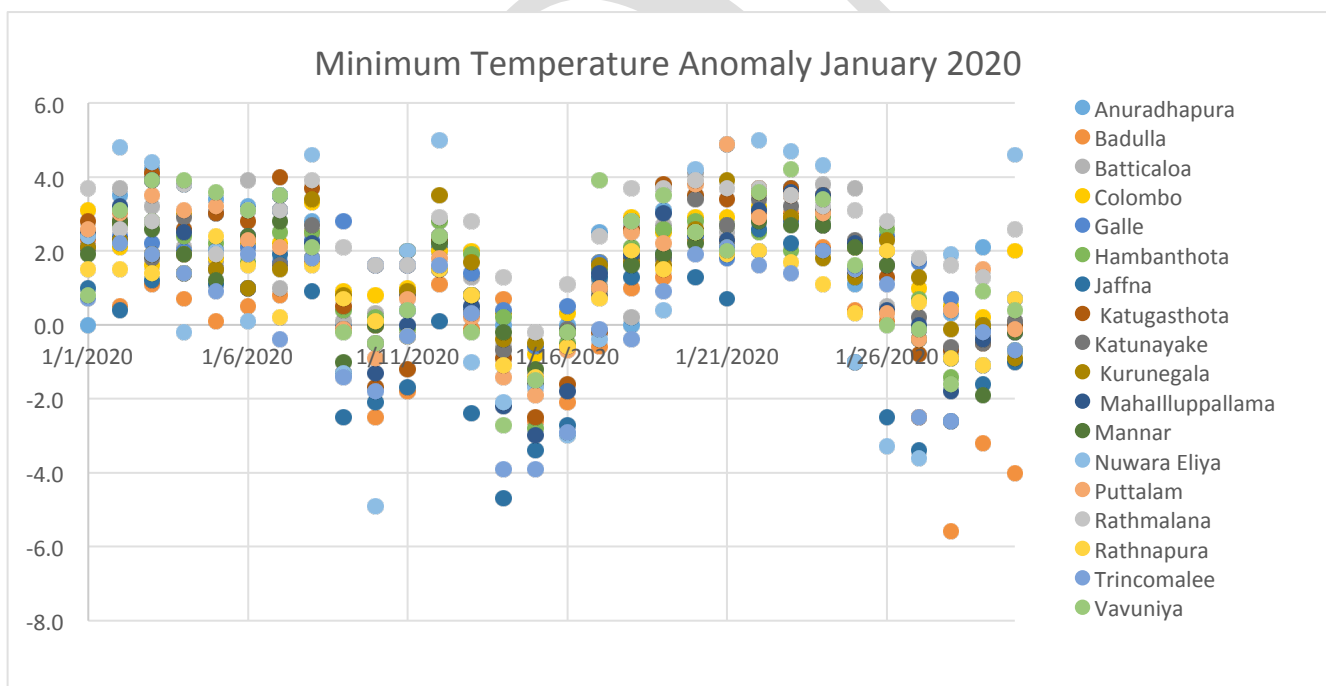


Fig 14 Minimum Temperature anomaly ($^{\circ}\text{C}$) for January 2020

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). Highest cumulative rainfall was 297.2 mm at Rantambe. Highest rainfall received during 24hours, was 138.3 mm at Panama Tank on the 12th.

There were only one significant widespread rainy spell from 19th to 22nd for January 2020 . 127.5 mm, 126.5mm and 111.3 mm rainfalls were reported from Rantambe, Randenigala and Panama tank respectively on 22nd January. Another rainy spells during first week of January with 94.0 mm from Padukka Estate on 1st January and 112.3 mm from Colombo on 02nd and between 11 and 12th January with 138.3 from Panama Tank on 12th January.

Below average rainfall was reported from most of principal meteorological stations except Colombo, Ratmalana and Ratnapurawhere above average rainfall was reported. Maximum percentage were reported from Colombo (198.6%) while minimum from Anuradhapura station (14.3%). Number of rainy days was about normal at Anuradhapuraya, Bandarawela, Katugastota and Kurunegala while above normal at Polonnaruwa, and Rathmalana. It is worthy mentioned that Anuradhapura station where minimum percentage of climatological average reported has 100% of rainy days indicating more occurrence of light showers in January 2020.

All the hydro catchment stations reported below average rainfall.

The table 2 and the figures 1 and 2 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 below average at almost all stations except Ratnapura where it was about average, Colombo, and Ratmalana where more than 150 to 200% averages were reported. Number of rain days was also reported below average. Well below average rainfalls were reported from all catchment areas.

Table 1(a) - Extremes of Maximum Temperatures				January	2020
	Maximum			Highest Std.Div	
	Value	Offsets			
		(-)	(+)		
Value	35.6	2.3	4.7	1.5	
Station	Kurunegala	Badulla	Galle	Galle and NuwaraEliya	
Date	19/01/2020	14/01/2020	07/01/2020		
Table 1(b) -Extremes of Minimum Temperature					
January 2020					
	Minimum			Highest Std.Div	
	Value	Offsets			
		(-)	(+)		
Value	4.5	5.6	5	3.1	
Station	NuwaraEliya	Badulla	NuwaraEliya	NuwaraEliya	
Date	10/01/2020	28/01/2020	12/01/2020 & 22/01/2020		

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 January2020

Meteorological station	Monthly Total rainfall(mm)			Monthly Total No of rainy Days		
	2020-Jan	Average	%	2020-Jan	Average	%
Anuradhapuraya	11.3	79.2	14.3%	6	6	100.0%
Badulla	68.8	155.2	44.3%	10	12	83.3%
Bandarawela	31.5	102.4	30.8%	8	8	100.0%
Batticaloa	105.6	210.3	50.2%	8	11	72.7%
Colombo	115.6	58.2	198.6%	4	5	80.0%
Galle	44.2	85.1	51.9%	5	8	62.5%
Hambantota	16.2	55.1	29.4%	3	5	60.0%
Jaffna	23.2	67.1	34.6%	3	4	75.0%
Monaragala	49.3			5		
Katugastota	23.0	79.4	29.0%	6	6	100.0%
Katunayake	35.7	45.8	77.9%	2	4	50.0%
Kurunegala	22.3	56.4	39.5%	4	4	100.0%
MahaIluppallama	19.8	69.8	28.4%	5	6	83.3%
Mannar	9.8	38.7	25.3%	4	6	66.7%
Polonnaruwa	132.9	163.5	81.3%	10	8	125.0%
NuwaraEliya	33.0	100.6	32.8%	7	8	87.5%
Poothuvil	181.7	288.4	63.0%	11		
Puttlam	13.0	50.1	25.9%	3	4	75.0%
Rathmalana	110.7	69.3	159.7%	6	5	120.0%
Rathnapura	123.5	111.1	111.2%	8	9	88.9%
Trincomalee	41.7	115.6	36.1%	5	7	71.4%
Vavuniya	12.4	84.2	14.7%	4	6	66.7%
Mattala	45.7			6		

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 their averages at Hydro catchment areas during January 2020

Hydro Catchment	January 2020	Average	% (Percentage of average)
Castlereigh	0.5	78.7	0.6%
Norton	5.0	92.8	5.4%
Maussakele	16.0	75.5	21.2%
Canyon	4.1	79.3	5.2%
Laksapana	5.7	114.0	5.0%
Kotmale	3.6	126.6	2.8%
Victoriya	143.6	199.2	72.1%
Randenigala	265.1	369.7	71.7%
Bowatenna	105.2	321.3	32.7%
Ukuwela	21.6	134.1	16.1%
SamanalaWewa	12.8	76.9	16.6%

Prepared by National Meteorological Centre(NMC)
Department of Meteorology

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