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இலங்கைப் பொதுப் பயன்பாடுகள் ஆணைக்குழு  
PUBLIC UTILITIES COMMISSION OF SRI LANKA



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Date }

Nov 27, 2023

Dr. Narendra De Silva  
General Manager,  
Ceylon Electricity Board

**Financial Situation of CEB – 2023**

Reference is made to your letters (Ref: DGM(CS&RA)/TRF/Trf.2023) dated Sep 4, 2023, Sep 26, 2023, Oct 17, 2023 and Nov 16, 2023 and Section 30 of Sri Lanka Electricity Act No. 20 of 2009.

The Commission observes following issues with your aforementioned submissions;

1. Non-evidence based hydro prediction

CEB has not submitted any evidence for its hydro generation forecast used in the tariff submission dated Oct 17, 2023. Report of the Department of Meteorology published in the first week of October is attached herewith. CEB is required to submit explanations for not taking into account the prediction report in its submission dated Oct 17, 2023.

Further CEB is required to submit any report, written communication or a meeting minute of Department of Meteorology that provided the basis for its hydro inflow forecast used for Oct 17, 2023 tariff submission.

The forecast submitted to the Commission by Department of Meteorology is attached for your reference.

2. Increase in fixed costs in CEB submissions

In its letter dated Sep 4, 2023 CEB had emphasized depleted hydropower generation and increase in demand as reasons for the increased cost and requirement of a tariff increase. Based on the said letter and subsequent tariff submission of Sep 26, 2023 the Commission initiated the tariff review. However, it is observed that CEB has increased its non-generation fixed costs by MLKR 9,343 compared to May 15, 2023 values. Details of the fixed cost increase is shown in the table below;

Description	Unit	15-May Submission for 2023H2	17-Oct Submission for 2023H2	Increase from 15-May to 17-Oct
Transmission Cost	MLKR	12,903	16,711	3,808
CEB Distribution Cost	MLKR	37,062	38,454	1,392
Corporate Cost	MLKR	-	5,467	
Finance Cost	MLKR	19,802	18,478	(1,324)
<b>Total Cost</b>	<b>MLKR</b>	<b>69,767</b>	<b>79,110</b>	<b>9,343</b>

CEB is required to submit explanations/justification for the increase in fixed costs shown above with detailed breakdown and also for concealing it in the tariff submission.

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28. ශාන්ත මයිකල් පාර, කොළඹ 03.

06 ஆவது மாடி, இலங்கை வங்கி வர்த்தகக் கோபுரம்,  
28, சென் மைக்கல் வீதி, கொழும்பு 03.

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3. Increase in fixed costs in accounts submitted in Nov 16, 2023

CEB submitted a latest estimate of 2023 Income Statement. In the said statement the fixed costs were further increased for the months October, November and December 2023. Total increase of fixed costs for the period July-Dec 2023 is MLKR 17,013. The details are shown below;

Description	Unit	15-May Submission for 2023H2	17-Oct Submission for 2023H2	16-Nov Submission	Increase from 15-May to 16-Nov
Transmission Cost	MLKR	12,903	16,711	16,567	3,664
CEB Distribution Cost	MLKR	37,062	38,454	48,997	11,935
Corporate Cost	MLKR	0	5,467	0	-
Finance Cost	MLKR	19,802	18,478	21,216	1,414
<b>Total Cost</b>	<b>MLKR</b>	<b>69,767</b>	<b>79,110</b>	<b>86,780</b>	<b>17,013</b>

CEB is required to submit explanations/justification for the increase in fixed costs shown above with detailed breakdown.

Due to aforementioned issues the Commission is of the view that CEB has understated the 2023 projected profit. Therefore, the Commission estimated the 2023 profit of CEB using CEB submitted actual generation data and dispatch data. The detail estimation is shown below;

Description	Unit	Jan to Sep – 2023 (Actual -as submitted by CEB)	Oct 2023 (Based on actual gen. data)	Nov 2023 (Based on actual gen. data upto 14 <sup>th</sup> )	Dec 2023 (CEB SDDP)	2023 Overall
<b>Total revenue</b>	<b>MLKR</b>	<b>461,666</b>	<b>51,845</b>	<b>53,700</b>	<b>57,286</b>	<b>624,497</b>
Generation Cost	MLKR	378,786	22,541	17,374	28,409	447,110
Transmission Cost	MLKR	12,870	1,426	1,380	1,426	17,102
CEB Distribution Cost	MLKR	42,532	5,790	5,603	5,790	59,715
Finance Cost	MLKR	44,217	2,489	2,409	2,489	51,604
<b>Total Cost</b>	<b>MLKR</b>	<b>478,405</b>	<b>32,246</b>	<b>26,766</b>	<b>38,114</b>	<b>575,531</b>
<b>Profit/(Loss)</b>	<b>MLKR</b>	<b>(16,739)</b>	<b>19,599</b>	<b>26,934</b>	<b>19,174</b>	<b>48,966</b>

- October 2023 – Generation energy cost is based on actual generation data.
- November 2023 – Generation energy cost is calculated pro rata basis based on actual generation data up to Nov 14, 2023.
- December 2023 – Generation energy cost is calculated using CEB dispatch forecast submitted on Oct 24, 2023.
- Generation capacity cost for Oct-Dec 2023 is based on CEB submitted Bulk Supply tariff filing on Sep 4, 2023.
- Transmission, Distribution and Finance cost is estimated as an equal distribution of Commission approved values for July-Dec 2023 on June 30, 2023.

If CEB does not agree with the above estimation CEB may submit an alternative forecast with detailed justification (that includes reasonable costs in terms of Section 30 of Sri Lanka Electricity Act No. 20 of 2009)

Further, CEB is required to submit;

1. The possibility of passing the benefit of expected profit (for 2023) to electricity consumers at next tariff revision.
2. The Terms of Reference prepared for the comprehensive audit (for CEB) as directed by the Commission along with the tariff approval dated Oct 19, 2023.

You are hereby required to submit all aforementioned information on or before Dec 07, 2023.



Damitha Kumarasinghe  
Director General



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**வளிமண்டலவியல் திணைக்களம்**  
**DEPARTMENT OF METEOROLOGY**  
ශ්‍රී ලංකාව இலங்கை SRI LANKA

**Consensus Seasonal Weather Outlook**  
**October, November and December(OND2023)**  
**Seasonal Rainfall and Temperature for Sri Lanka**

**These forecasts are prepared using**

- The prevailing global climate conditions.
- Forecasts from different climate models from around the world.
- Statistical downscaling of GCM output using CPT

**Issued by Centre for Climate Change Studies (CCCS)**

**and**

**Research Division**

## 1. Prevailing global climate conditions

During the last four weeks, equatorial SSTs were above average across most of the Pacific Ocean, in the western Indian Ocean, and across much of the Atlantic Ocean (Fig.1 and Fig.2). During the last four weeks, positive SST anomaly changes were evident in the western and east-central Pacific Ocean, and negative changes were observed in the eastern Pacific.

### 1.1 El Niño and La Nina update

El Niño conditions are observed. Equatorial sea surface temperatures (SSTs) are above average across the central and eastern Pacific Ocean. The tropical Pacific atmospheric anomalies are consistent with El Niño. El Niño is anticipated to continue through the Northern Hemisphere winter (with greater than a 95% chance through January-March 2024).

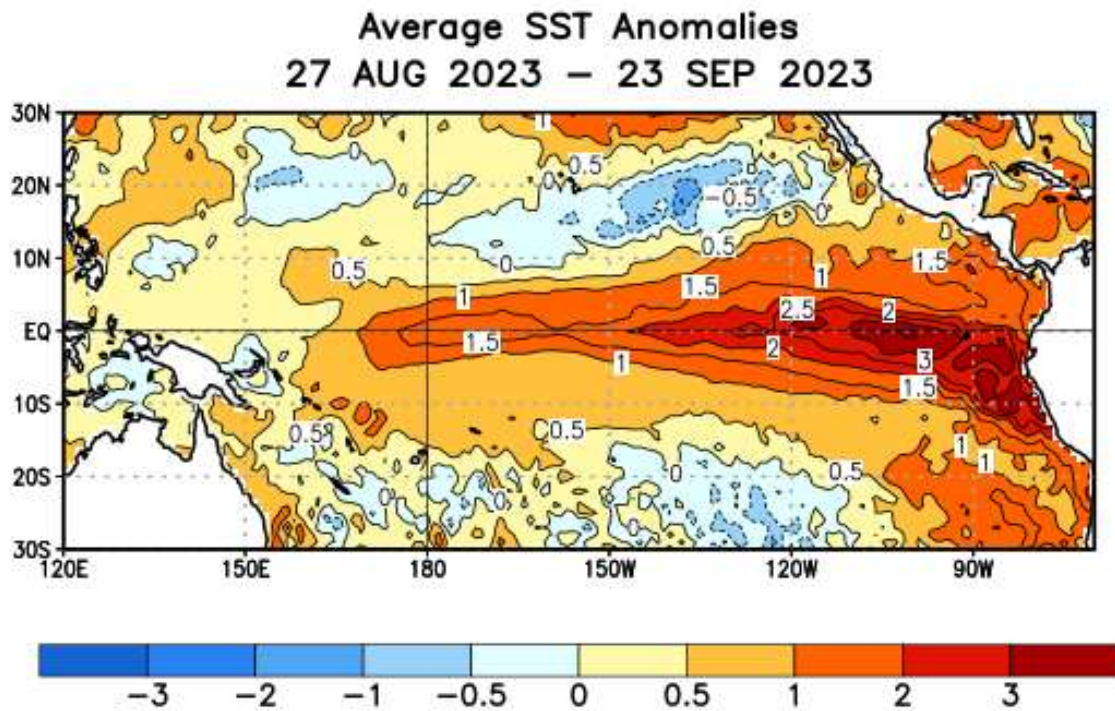


Fig 1: Observed Average sea surface temperature (SST) anomalies (°C)

## Weekly SST Anomalies (DEG C)

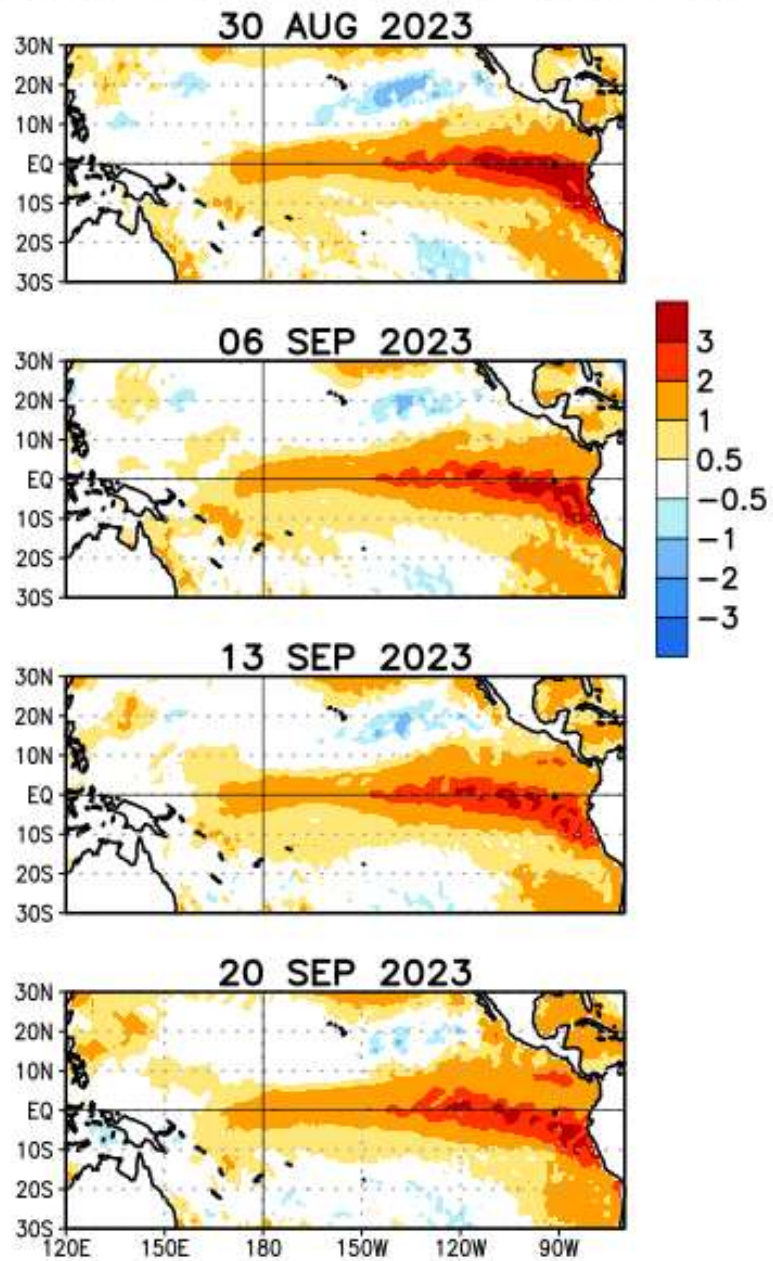


Fig 2: Weekly Observed Average sea surface temperature (SST) anomalies (°C)

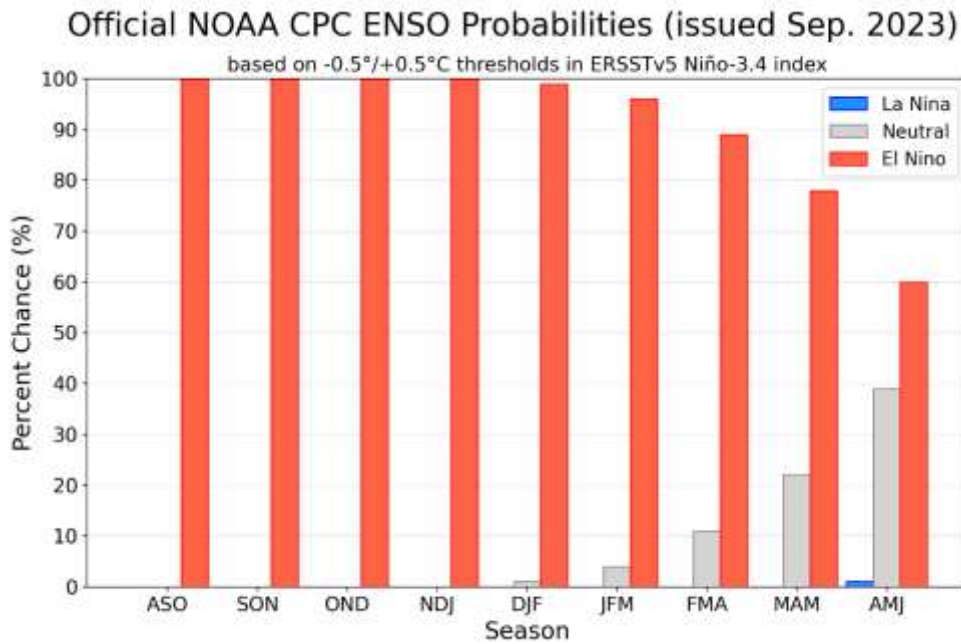


Fig 3a: ENSO forecast from Climate Prediction Center (CPC)/ IRI Forecast

### 1.1.1 Impacts of El-Niño on monthly rainfall anomaly during October, November and December

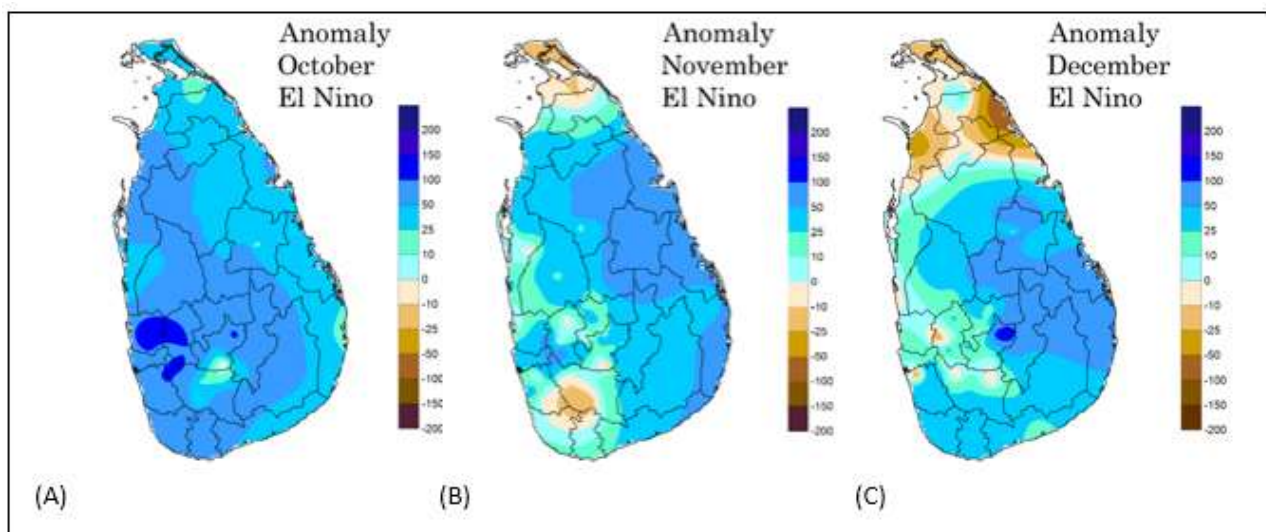


Fig 3b: Monthly Rainfall Anomaly maps of the months of October(A), November (B) and December (C) during El-Niño years (Hapuarachchi et al 2016)

Previous studies conducted by the Department of Meteorology, identified that, during El-Niño years, above normal rainfalls are likely over the most parts of the country during the month of October (Fig 3b(A)). During the month of November above normal rainfalls are likely over most parts of the country, while below normal rainfalls are expected in some areas in Jaffna, Killnochchi, Rathnapura, Kalutara, Galle and Mathara districts (Fig 3b(B)). During the month of December above normal rainfalls are likely over most parts except northern province, where below normal rainfalls are likely when El-Niño conditions were persistent(Fig 3b(C)).

## 1.2 The Indian Ocean Dipole (IOD) update

A positive IOD event is underway. The Indian Ocean Dipole (IOD) index was +1.45 °C for week ending 24 September. This is its sixth week above the positive IOD threshold (+0.40 °C).

Weekly sea surface temperatures (SSTs) for the week ending 24 September show warmer than average waters close to the Horn of Africa. Conversely, the eastern pole of the IOD was cooler than average, with a notable area of cooler waters extending southwards from the coast of Java. This shows a clear gradient between the western and eastern tropical Indian Ocean that is typical of a positive IOD. Compared to last week, the cooling has expanded westwards from Java and the warm anomalies have slightly cooled over the western pole of the IOD. All international climate models surveyed by the Bureau suggest the positive IOD event is likely to continue for the remainder of the southern hemisphere spring. (BOM-Australia).

A positive IOD typically leads to enhance rainfall over Sri Lanka during OND season.

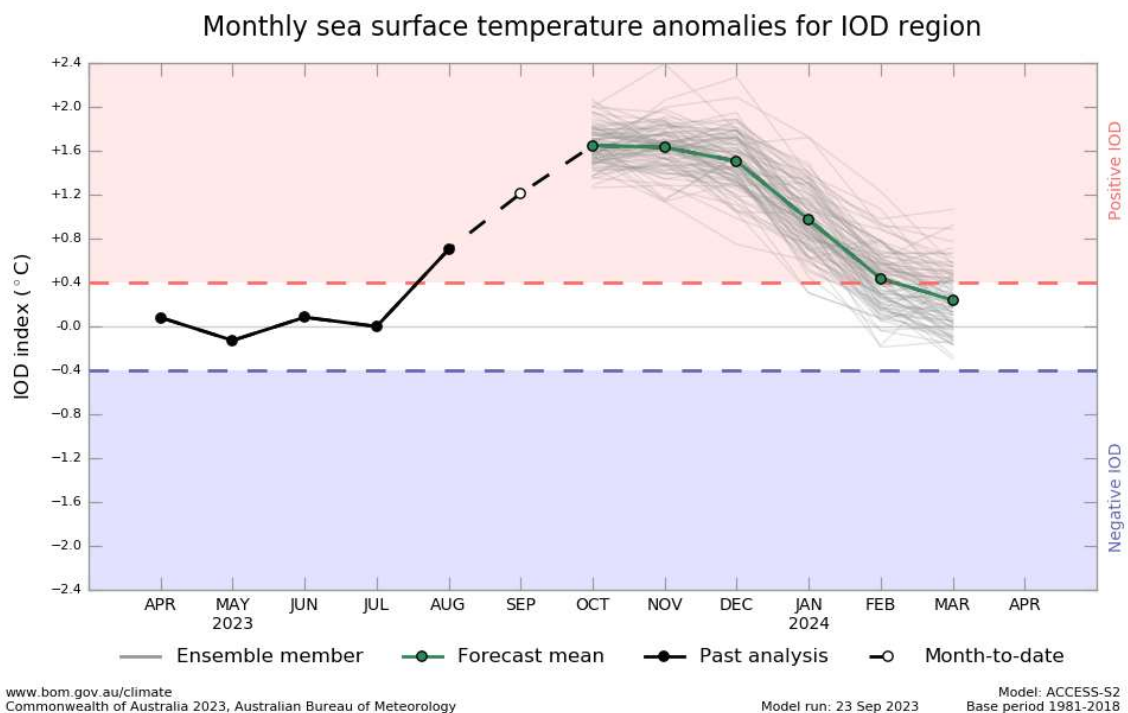


Figure 4a: IOD forecast from Australian Bureau of Meteorology



### 1.2.1 Impacts of positive IOD on monthly rainfall anomaly during October, November and December

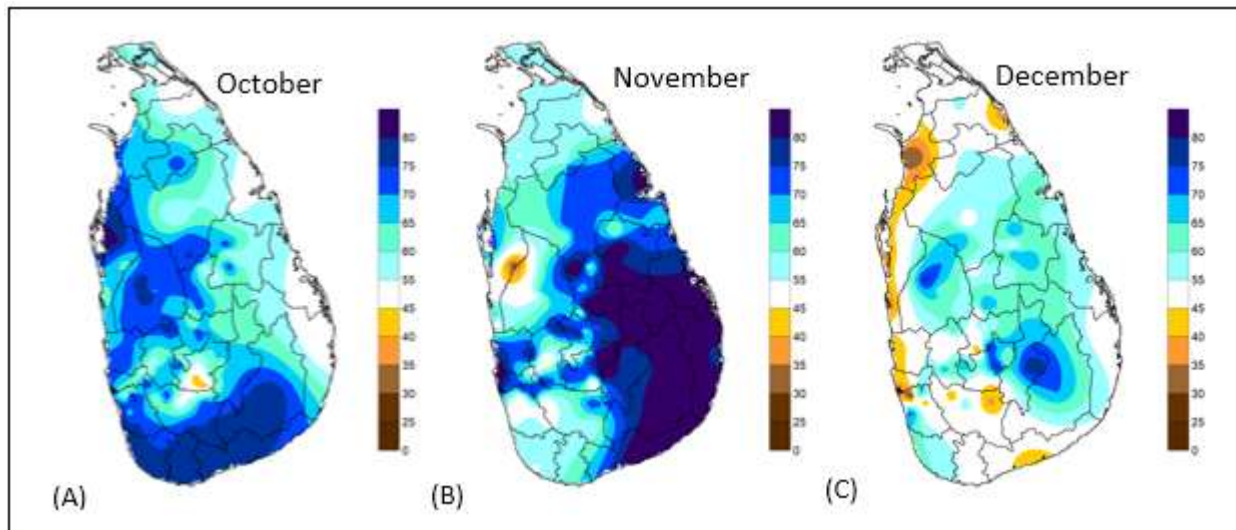


Fig 4b: Median Based Composite maps of Monthly Rainfall during October(A), November (B) and December (c) during positive IOD years (Hapuarachchi et al 2018)

Previous studies conducted by the Department of Meteorology identified that there is a higher probability of getting near or above normal rainfalls in most of the areas of the country (Fig 4b(A) and (Fig 4b (B)) during the months of October and November under the positive IOD condition. During the month of December it is showing the higher probability of getting near or above normal rainfall all over the country except western and north western coastal areas where below normal rainfalls are likely ( Fig 4b (C)).

## 2. Forecasts from different climate models from around the world.

### 2.1 October to December(OND) 2023 season

Figure 5 shows the probabilistic multi model ensemble forecast which prepared by using dynamical models from 13 Global Producing Centers (GPC) for OND season. It can be expected above normal rainfalls over most parts of the country except northern province, where no clear signal indicated. Accordingly below or about or above normal rainfall can be expected over northern province during October–December(OND) 2023 season.

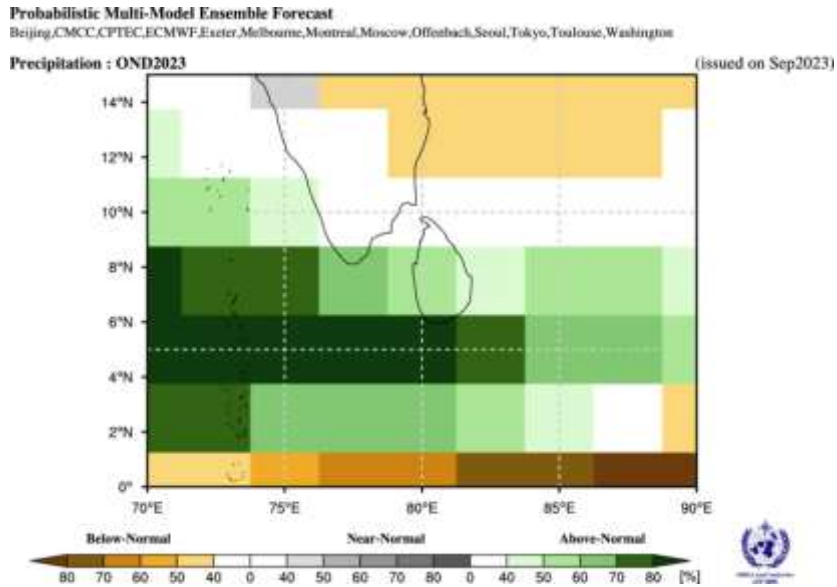


Fig 5: Probabilistic multi model ensemble forecast for OND using dynamical models from 13 WMO global producing centers (GPC).

Figure 6 depicts individual forecasts provided by same GPC centers for the OND season. Out of 13 GPC individual models, 10 models predicted above normal rainfall over the country and 3 models predicted abovenormal rainfall in southern parts of the country. Accordingly above normal rainfalls are likely over the country during OND 2023 season.

Lat : -15.0~40.0, Lon : 50.0~160.0  
Precipitation : OND2023

[Unit: mm]  
(issued on Sep2023)

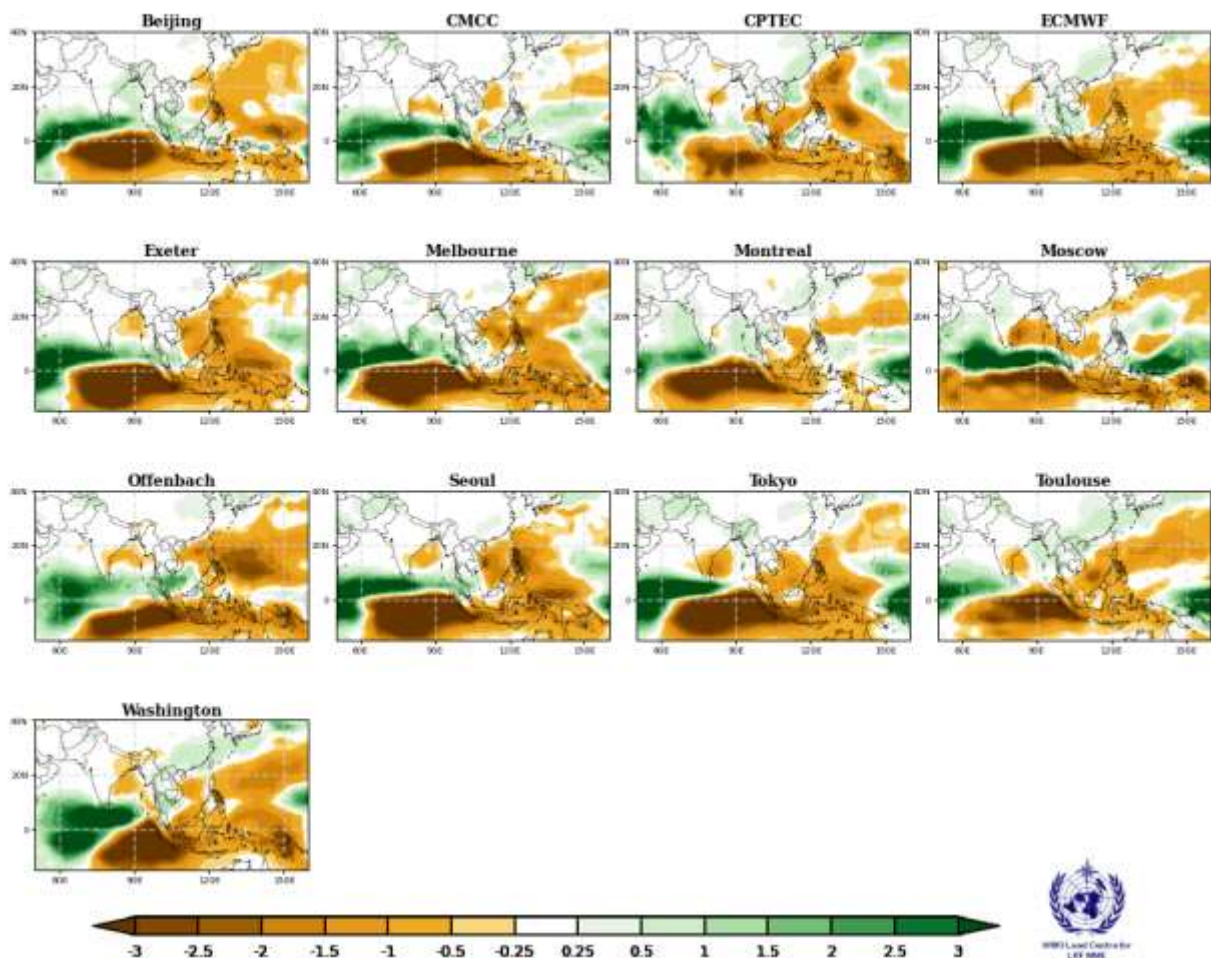


Fig 6: Individual forecasts for OND 2023 season by dynamical models from 13 WMO global producing centers (GPC).

## 2.2 Monthly Forecast for October, November and December 2023

Figure 7 shows the probabilistic multi model ensemble forecasts, which are prepared by using dynamical models from 13 global producing centers (GPC), for the months of October, November and December 2023. According to that during the month of October it can be expected above normal rainfall over the country except northern part where below normal rainfalls are likely. During the month of November it can be expected above normal rainfall over the country except northern and eastern part of the country, where is no clear signal indicated. During the month of December it can be expected above normal rainfall over southern coastal areas and there is no clear signal indicated over remaining areas of the country. Accordingly above, about or below normal rainfall can be expected over no signal area during the season.

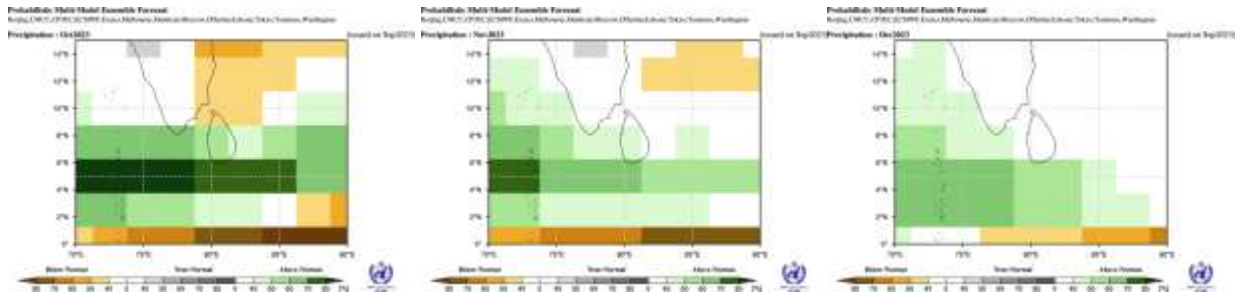


Fig 7: Probabilistic multi model ensemble forecast for October(left), November (middle) and December (right) 2023 using dynamical models from 13 WMO global producing centers (GPC).

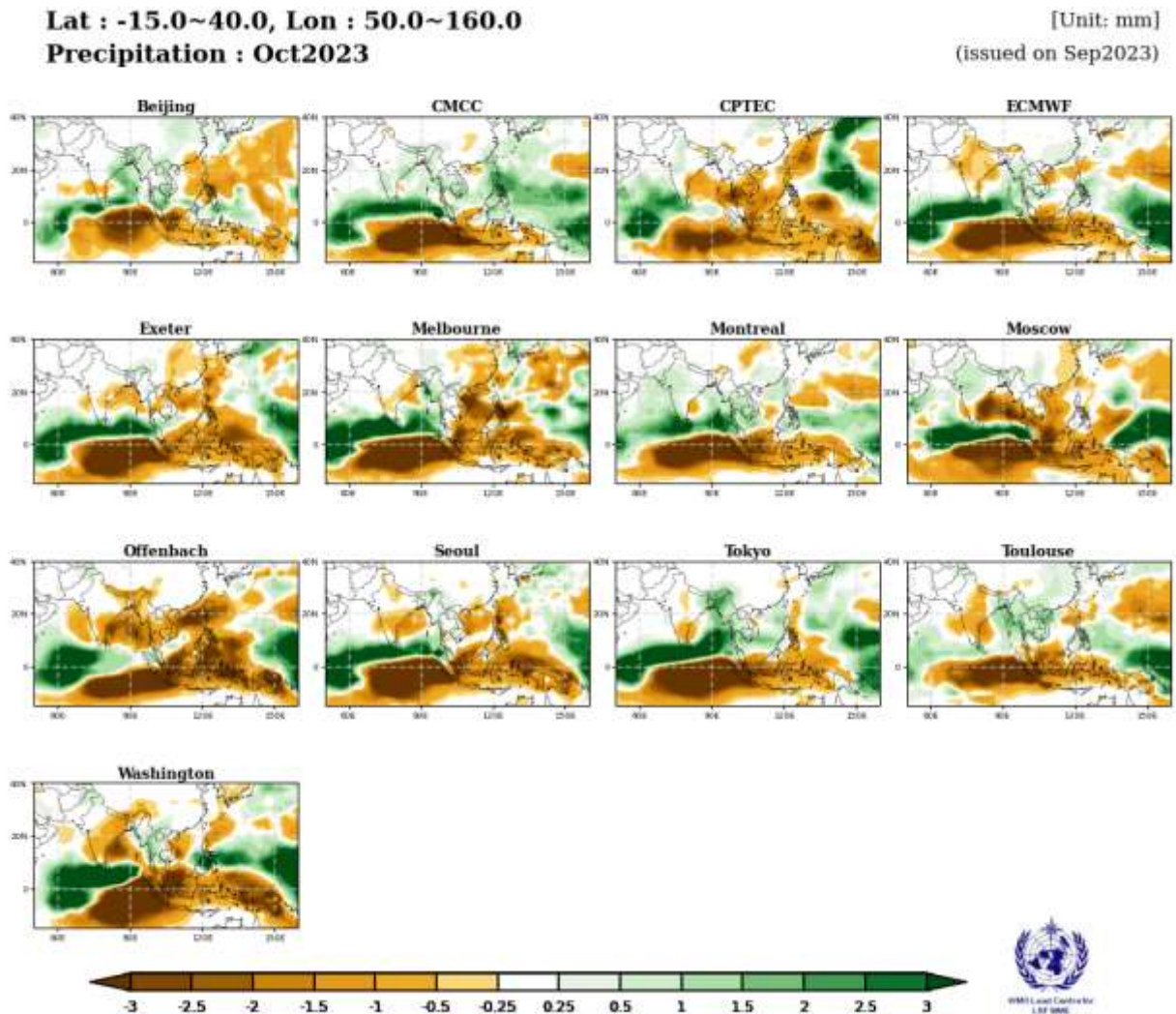


Fig 8: Individual forecast for October 2023 by dynamical models from 13 WMO global producing centers (GPC).

Figure 8 shows the 13 monthly forecasts from individual global producing centers (GPC) for October 2023. Out of 13 GPC forecasts, 10 GPC models predicted above normal rainfalls and one GPC model predicted below normal rainfall over the country. Accordingly above normal rainfalls are expected over the country during the month of October 2023.

Lat : -15.0~40.0, Lon : 50.0~160.0  
Precipitation : Nov2023

[Unit: mm]  
(issued on Sep2023)

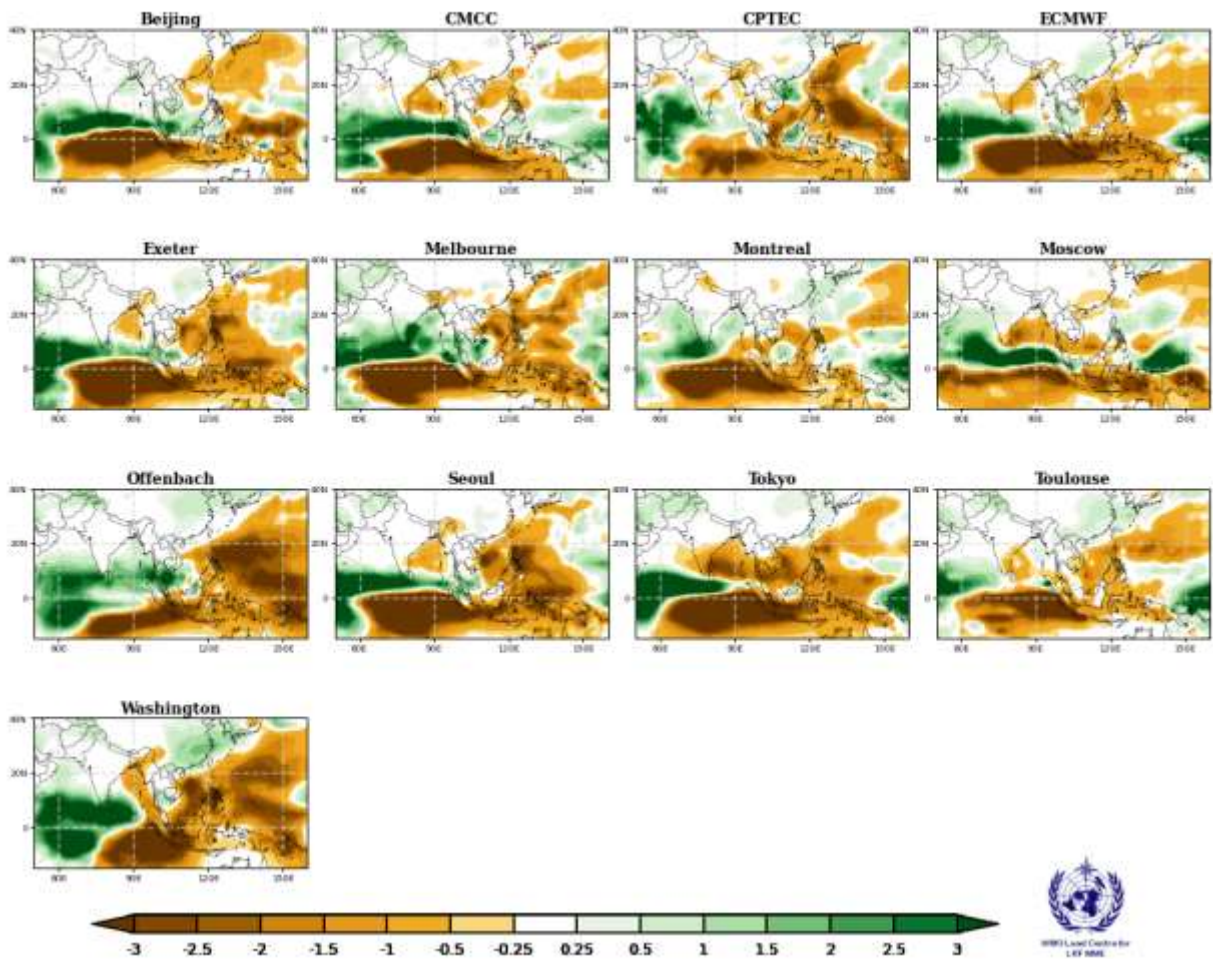


Fig 9: Individual forecast for November 2023 by dynamical models from 13 WMO global producing centers (GPC).

Figure 9 shows the monthly forecasts from individual global producing centers (GPC) for November 2023. Out of 13 GPC forecasts, 8 GPC models predicted above normal rainfalls over the country. There is no clear signal indicated in 5 GPC models. Accordingly above normal rainfalls can be expected over the country during the month of November 2023.

Lat : -15.0~40.0, Lon : 50.0~160.0  
Precipitation : Dec2023

[Unit: mm]  
(issued on Sep2023)

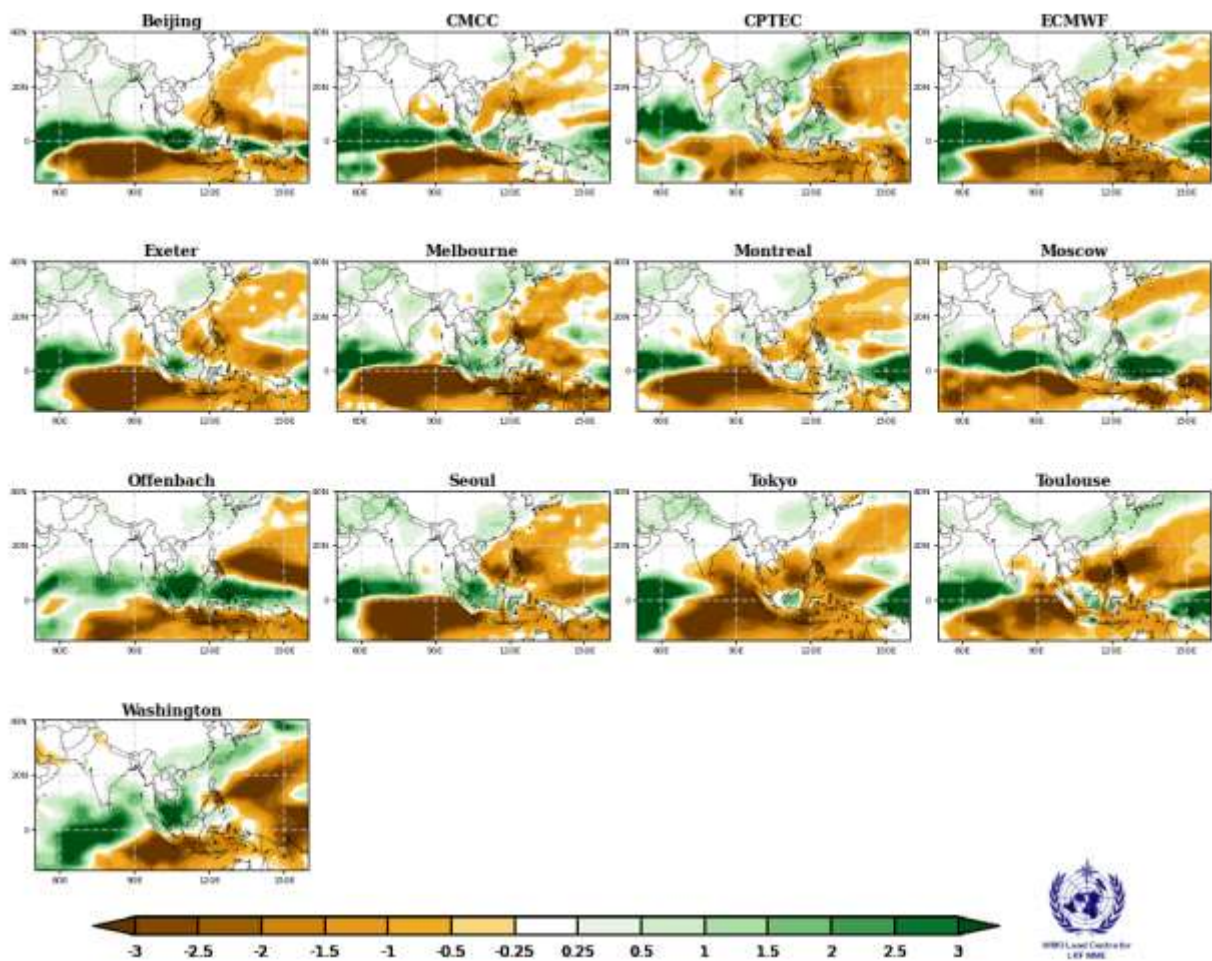


Fig 10: Individual forecast for December 2023 by dynamical models from 13 WMO global producing centers (GPC).

Figure 10 shows the monthly forecasts from 13 individual global producing centers (GPC) for December 2023. Out of 13 GPC forecasts, 9 GPC models indicate above normal rainfall and 2 GPC models indicate below normal rainfall over the country. There is no clear signal indicated in 2 GPC models. Accordingly it can be expected above normal rainfall over the country during the month of December 2023.

### 3. Statistical downscaling of CFSv2 global forecast output

#### 3.1 Probabilistic rainfall forecast for OND season 2023 using Climate Predictability tool (CPT)

The following district wise probabilistic rainfall forecasts for the season of OND 2023 have been prepared with the multi model ensemble method to downscale, SST data of CFSv2, CCSM4, GFDL and ECMWF by using CPT.

The district wise 30 year average rainfalls during OND season are given in the column 2 of the table 1. Chance (probability) of receiving below/about/above average is given in the columns 3, 4, and 5 respectively in the table 1.

District	Average rainfall (mm) –OND	Probability%		
		Below	Normal	Above
Colombo	924.3	30	25	45
Kalutara	1124.8	40	30	30
Galle	1038.8	30	25	45
Matara	900.8	20	20	60
Hambantota	556.1	20	20	60
Ampara	794.8	20	25	55
Batticaloa	873.4	20	30	50
Trincomalee	846.8	20	30	50
Mullaithivu	804.2	20	30	50
Jaffna	809.5	30	25	45
Killinochchi	814.6	25	25	50
Mannar	634.5	25	25	50
Puttalam	590.6	20	20	60
Gampaha	816.7	25	30	45
Kegalle	1043.5	25	25	50
Ratnapura	973.2	20	20	60
Monaragala	780.5	20	20	60
Badulla	954.4	20	25	55
Pollonnaruwa	880.1	25	30	45
Vavuniya	757.2	25	30	45
Anuradapura	699.3	25	25	50
Kurunegala	708.8	30	25	45
Matale	927.2	30	30	40
Kandy	961.0	20	25	55
Nuwaraeliya	871.7	20	20	60

**Table 1:** Probabilistic Rainfall Forecast for OND season 2023 using CPT

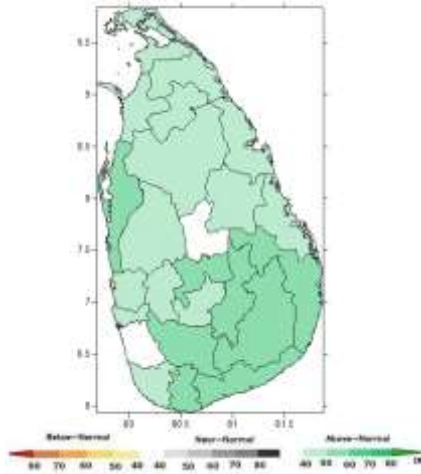


Fig 11: Probabilistic rainfall forecast for October –December 2023 using CPT

According to the CPT (Fig 11 and table 01), above normal rainfalls can be expected most parts of the country except Mathale and Kalutara Districts. There is no clear signal indicated for Kalutara and Mathale districts Accordingly equal chances exist of receiving below, about or above normal rainfall over no signal areas for OND Season 2023.

### **3.2 Multi-model ensemble mean forecast of NMME models**

This probabilistic forecast is developed by combining direct Forecasts from 5 NMME models (CFS, CanSIPS, GFDL, COLA and NASA) with the forecasts obtained by statistically processing of each models.

According to the Figure 12 above normal rainfall can be expected over most parts of the country during the OND Season 2023

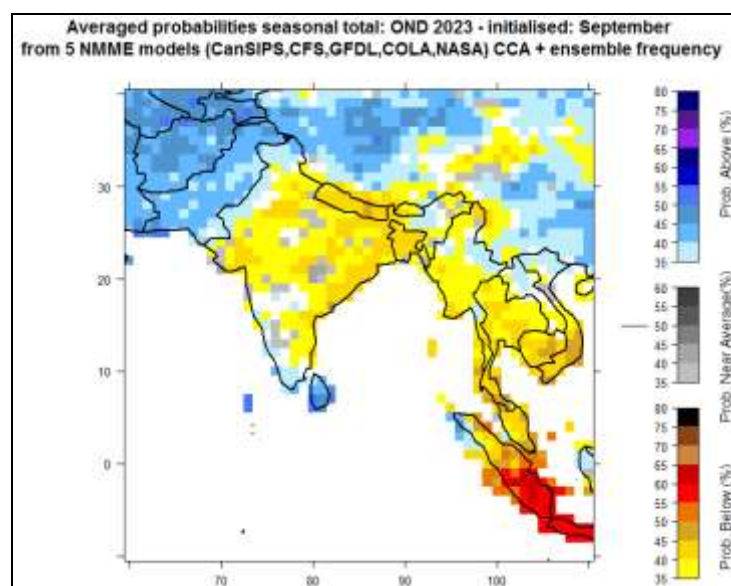


Fig 12. Average probability forecast of NMME models for OND 2023



### 3.3 Probabilistic rainfall forecast for OND 2023 season using RIMES FOCUS System

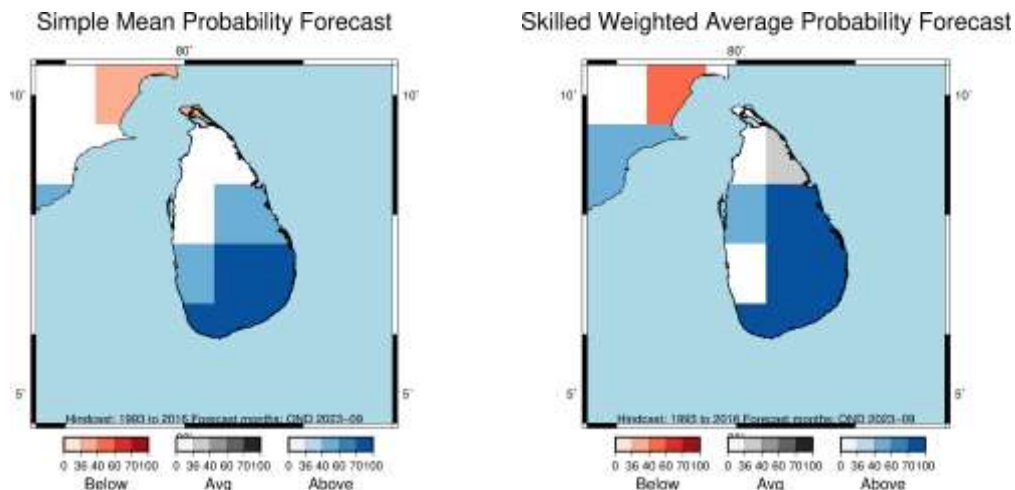


Fig 13. Probabilistic rainfall forecast for October-December 2023 using RIMES FOCUS System

Figure 13 depicts the Probabilistic rainfall forecast for OND 2023 season, which has been prepared by using RIMES FOCUS System.

According to the model outputs above normal rainfalls are likely over Southern, South eastern and Central parts of the country. Below normal rainfalls are likely over extream northern part of the country. There is no clear signal indicated over the remaining areas for OND season 2023.

#### 4. SUMMARY :

SUMMARY of MODEL FORECAST for OND 2023 season for SRI LANKA						
Season	WMO LC MME	WMO GPC	CPT	FOCUS	Impact of Global conditions	Final Rainfall Forecast
OND season 2023	No Signal –Northern part AN- Elsewhere	AN	No Signal- Kalutara, Mathale AN- Elsewhere	AN- Southern, Southeastern and Cental part BN- Jaffna district	Above normal rainfall during OND under El Nino and positive IOD condition	Below normal rainfalls are likely over Northern province and possibility for above normal rainfall over remaining areas
October 2023	BN- Northern part AN - Elsewhere	AN			Above normal rainfall during OND under El Nino and positive IOD condition	Below normal rainfalls over Northern province , near normal over Northcentral province and Trincomlaee distrcit with above normal possibility for elsewhere
November 2023	No Signal-Northern, Eastern part AN- Elsewhere	AN			Above normal rainfall during OND under El Nino and positive IOD condition	Near or slightly above normal rainfalls over most parts except northern and Northwestern provinces where slightly below normal rainfalls
December 2023	AN- Southern part No Signal-Elsewhere	AN				Near normal rainfalls over most parts except western province and in Rathnapura and Matara districts where possibility for slightly below normal rainfalls.

BN: Below Normal      NN: Near Normal      AN: Above Normal      CP: Climatological Probability

Table 2: Summary of Model Forecasts for OND season 2023

#### **4.1 Summary of prevailing global climate conditions**

The tropical Pacific atmospheric anomalies are consistent with El Niño. El Niño is anticipated to continue through the Northern Hemisphere winter (with greater than a 95% chance through January to March 2024).

A positive IOD event is underway. The Indian Ocean Dipole (IOD) index was +1.45 °C for week ending 24 September. This is its sixth week above the positive IOD threshold (+0.40 °C). (Source-Bureau of Meteorology, Australia).

### **5. Consensus Seasonal outlook for October, November and December 2023**

Considering the prevailing global climate conditions, forecasts from different global climate models and statistical downscaling of GCM output using CPT, consensus forecasts for October to December 2023 season is concluded as follows.

#### **5.1 Rainfall forecast for the three months period during October-November-December (OND) 2023**

There is a possibility of having above normal rainfall over the country except Northern province where below normal rainfall can be expected during OND 2023 season as a whole. (Fig. 14).

#### **5.2 Rainfall forecast for October 2023**

There is a chance of having below normal rainfalls over Northern province, near normal over Northcentral province and Trincomalee district with above normal possibility for elsewhere during the month of October 2023. However there is a possibility for developing low level atmospheric disturbances during the month of October, if so rainfalls can be enhanced over most parts of the country.

#### **5.3 Rainfall forecasts for November 2023**

Near or slightly above normal rainfalls over most parts except northern and Northwestern provinces where slightly below normal rainfalls during the month of November 2023. However there is a possibility for developing low level atmospheric disturbances during the month, if so rainfalls can be enhanced over most parts of the country.

#### **5.4 Rainfall forecasts for December 2023**

Near normal rainfalls over most parts except western province and in Rathnapura and Matara districts where possibility for slightly below normal rainfalls during the month of December 2023.

However there is a possibility for developing low level atmospheric disturbances and cyclones in the vicinity of Sri Lanka during the month of December, if so rainfalls forecast can be deviate with a chance of enhancing rainfall over most parts of the country.

\*\*In addition, the predictability is also limited due to strong day-to-day atmospheric variability caused by the passage of the synoptic scale systems such as lows and depressions. Intraseasonal Oscillations such as Madden Julian Oscillations (MJO) is also another atmospheric phenomina which can't be underestimated.

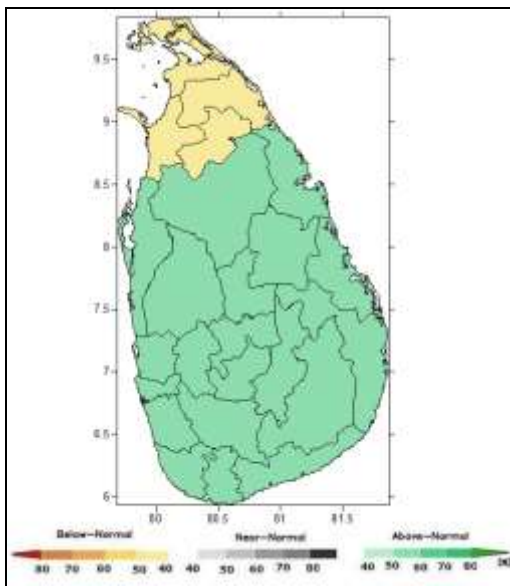


Fig 14. Consensus Probabilistic rainfall forecast for October–December2023

### **5.5 Probabilistic Temperature Forecast from October to December 2023 (OND)**

The probabilistic Temperature forecast for October, November and December season (OND) 2023 for Sri Lanka as given below.

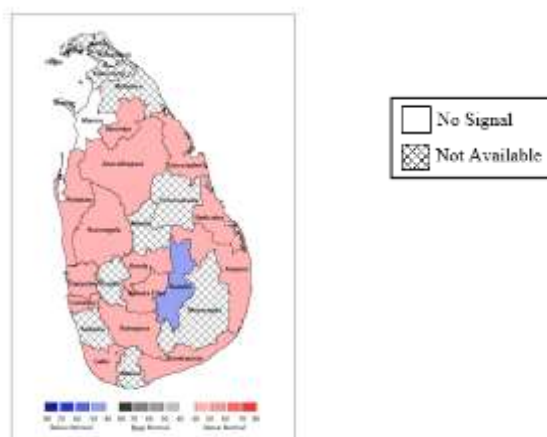


Fig 15: Probabilistic forecast for Maximum Temperatures for OND season 2023

Fig 15 and Table 3 show the probabilistic forecast for Maximum Temperatures during OND season 2023.

There is a higher chance of experiencing slightly above the normal Maximum Temperatures in Vavuniya, Anuradhapura, Puttlum, Kurunegala, Colombo, Gampaha, Kandy, Nuwara Eliya, Galle, Hambantota, Trincomalee, Batticaloa, Ampara and Rathnapura districts and slightly below the normal Maximum Temperatures in Badulla district (Fig 15) for the OND season 2023.

The district wise average Maximum Temperatures are given in the column 2 of the table 3 and the chance (probability) of receiving below/about/above averages are given in the columns 3, 4, and 5 respectively.

District	Average Maximum Temperature (°C) – (OND)	Probability %		
		Below	Normal	Above
Anuradhapura	30.5	30	30	40
Badulla	27.1	45	30	25
Batticaloa	29.4	30	30	40
Colombo	30.1	30	30	40
Galle	28.9	25	30	45
Hambantota	29.8	30	30	40
Katugastota	28.3	30	25	45
Katunayake	30.9	30	25	45
Mannar	29.6	30	35	35
MahaIlluppallama	30.4	30	30	40
NuwaraEliya	19.6	30	30	40
Pottuvil	30.5	25	30	45
Puttalam	30.4	30	25	45
Ratnapura	31.6	35	20	45
Ratmalana	30.4	25	30	45
Trincomalee	29.7	25	30	45
Vavuniya	30.3	35	25	40
Kurunegala	30.7	20	35	45
Bandarawela	23.5	40	30	30

Table 3: probabilistic forecast for Maximum Temperature for OND season 2023

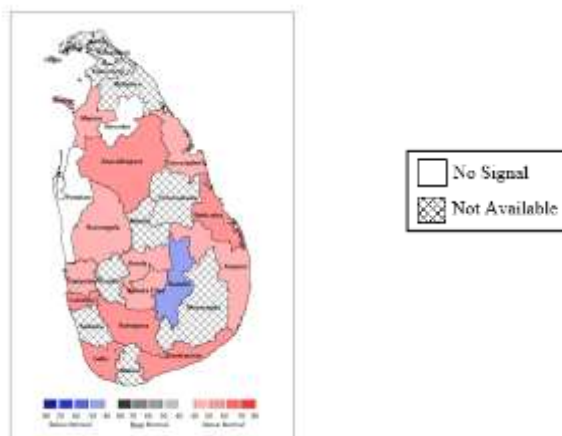


Fig 16: Probabilistic forecast for Minimum Temperatures for OND season 2023

District	Average Minimum Temperature (°C) – (OND)	Probability %		
		Below	Normal	Above
Anuradhapura	22.6	25	25	50
Badulla	18.7	45	25	30
Batticaloa	23.9	20	30	50
Colombo	23.3	25	20	55
Galle	23.6	20	30	50
Hambantota	23.7	20	30	50
Katugastota	19.9	25	35	40
Katunayake	22.9	30	25	45
Mannar	24.6	20	35	45
MahaIlluppallama	22.2	30	30	40
NuwaraEliya	11.4	30	25	45
Pottuvil	23.2	30	30	40
Puttalam	23.0	30	35	35
Ratnapura	22.6	20	25	55
Ratmalana	23.0	25	25	50
Trincomalee	24.3	20	35	45
Vavuniya	22.2	35	35	30
Kurunegala	22.2	35	25	40
Bandarawela	15.6	45	25	30

Table 4: Probabilistic forecast for Minimum Temperatures for OND season 2023

Fig 16 and Table 4 provide the probabilistic forecast for Minimum Temperatures during OND season 2023.

Accordingly, there is a higher chance of experiencing slightly above the normal Minimum Temperatures in Mannar, Anuradhapura, Kurunegala, Colombo, Gampaha, Rathnapura, Hambantota, Galle, Kandy, Nuwara Eliya, Ampara, Trincomalee and Batticaloa districts and slightly below the normal Minimum Temperatures in Badulla district (Fig 16) during OND season 2023.

Note- Temperature forecasts are not available in **Matara, Kegalle, Kalutara, Monaragala, Polonnaruwa, Jaffna, Killinochchi, Mullativu and Mathale** districts due to unavailability of Climate data.

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DEPARTMENT OF METEOROLOGY

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බෞද්ධලෝක මාවත, කොළඹ 07, ශ්‍රී ලංකාව / பொளத்தாலோக மாவத்தை, கொழும்பு 07, இலங்கை. / Bauddhaloka Mawatha, Colombo 07, Sri Lanka.

2023-10-19

Director General  
Public Utility Commission of Sri Lanka

Dear sir,

**Rainfall Forecast in Hydro Power Catchment Areas**

This has reference to your letter No PUC/LIC/MET/2030/02, dated 09<sup>th</sup> October 2023 regarding the above matter.

1. Department of meteorology is currently issuing monthly rainfall forecast only for next 3 months and it is updated monthly basis at the beginning of each month. Therefore rainfall forecast for January to April 2023 is not yet available.

District wise Rainfall forecasts from October to December 2023 are as follows.

District	October 2023	November 2023	December 2023
Nuwara-Eliya	Above normal	Above normal	Near normal
Kandy	Above normal	Above normal	Near normal
Rathnapura	Above normal	Above normal	Below normal

However, the predictability is also limited due to strong day-to-day atmospheric variability caused by the passage of the synoptic scale systems such as atmospheric low-pressure systems, depressions and cyclones as well as intraseasonal Oscillations such as Madden Julian Oscillations (MJO).

2. Climate outlook for October to December (OND) 2023 season over Sri Lanka has been developed through an expert assessment of the prevailing global climate conditions (El Nino and positive IOD conditions..etc) which are influencing Sri Lankan climate, and the seasonal forecasts from different global climate models around the world. Therefore, it is not possible to give most similar years (October to April) to the rainfall forecast for 2023/2024. However, research findings on observed rainfall during past El Nino and IOD years are attached herewith for your reference (annex 01).

3. Temperature forecast from January to April 2024 is not available yet. Long term average maximum and Minimum temperatures are attached herewith (annex 02).

4. Observed Maximum and Minimum temperatures recorded at regional meteorological offices during January to April 2023 are attached.(annex 03)



A.R.P. Warnasooriya  
Director (Climate change and Research)  
For Director General of Meteorology



## Monthly Rainfall Forecasts for Upcoming season

### 1. Monthly Rainfall forecast for October to December 2023

This consensus climate outlook for October to December 2023 season over Sri Lanka has been developed through an expert assessment of the prevailing global climate conditions which are known to influence the South Asian climate and seasonal forecasts from different climate models around the world.

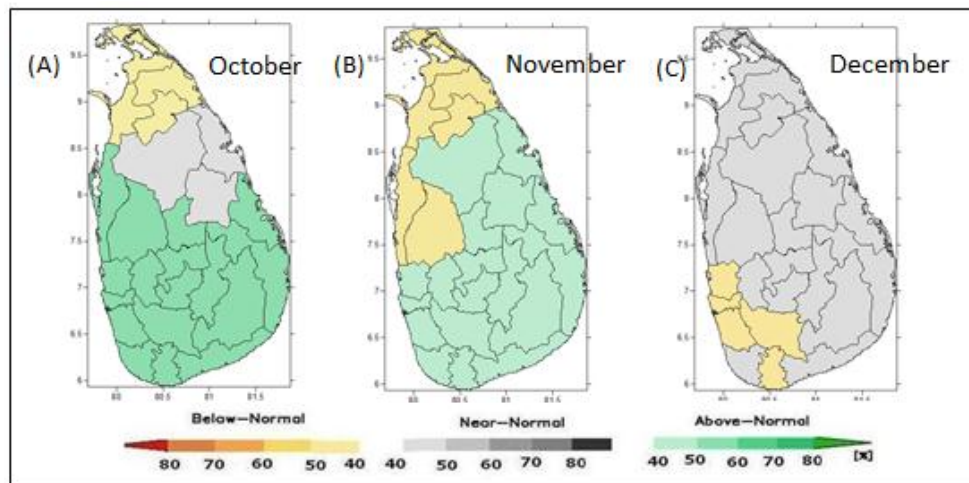
The **El Nino/La Nina** in the tropical Pacific Ocean and the **Indian Ocean Dipole(IOD)** that develops in the Indian Ocean are among the regional and seasonal factors that can affect Sri Lanka's climate, especially rainfall and temperature variations.

The tropical Pacific atmospheric anomalies are consistent with El Niño. El Niño is anticipated to continue through the Northern Hemisphere winter (with greater than a 95% chance through January to March 2024).

A positive IOD event is underway. All international climate models surveyed by the Bureau of Meteorology Australia suggest the positive IOD event is likely to continue for the remainder of the southern hemisphere spring.

**Both El Nino and positive IOD** typically leads to enhance rainfall over Sri Lanka during OND season.

### Monthly probabilistic rainfall forecast for October-November-December 2023



(Yellow- Below normal, Ash –Near normal, Green-Above normal, White-No data)

## 2. Monthly Rainfall Forecasts for October to December 2023

### 2.1 El Nino forecast

According to global climate forecasts (Figure 1), the tropical Pacific atmospheric anomalies are consistent with El Niño. El Niño is anticipated to continue through the Northern Hemisphere winter (with greater than a 95% chance through January-March 2024).

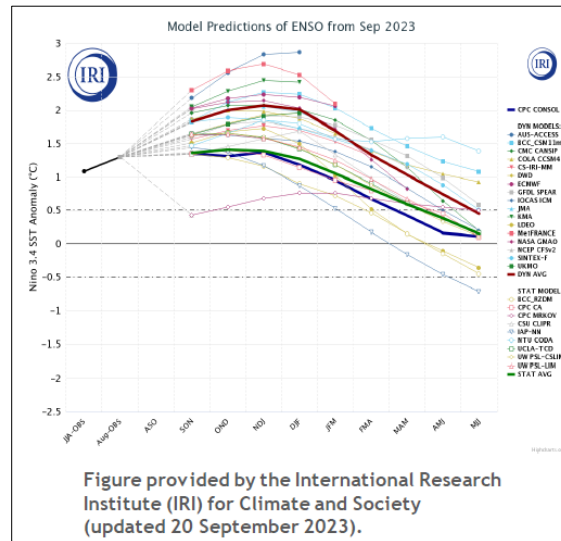


Figure 1. Global climate model forecasts for El Niño (IRI)

### El Niño and Rainfall

El Niño conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although they vary somewhat from one El Niño to the next, the strongest shifts remain fairly consistent in the regions and seasons shown on the map below.

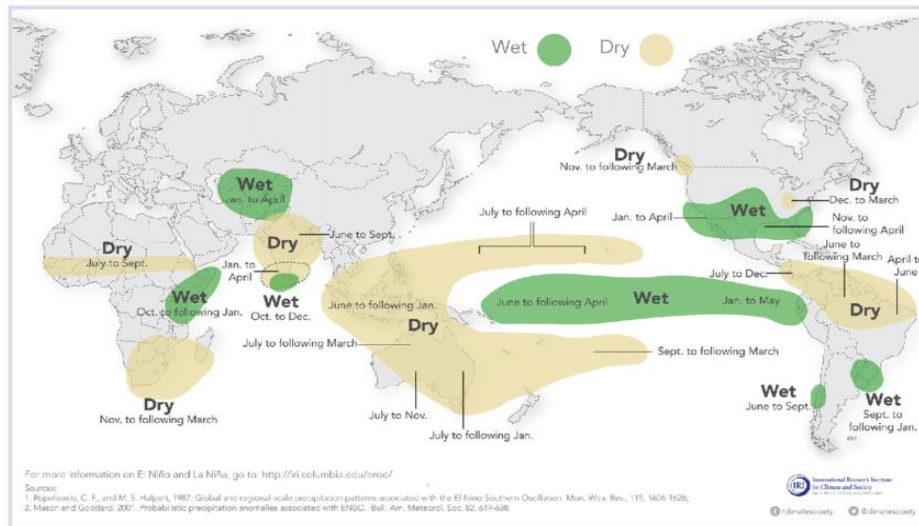


Figure 2. Typical rainfall pattern during El Nino events (IRI)

The research presented by the International Research Institute (IRI) revealed that Sri Lanka is likely to experience wet condition during El Nino years from October to December (Figure 2).

According to the research conducted by the Department of Meteorology regarding the rainfall pattern with previous El Nino years (Hapuarachchi et al 2015), most parts of Sri Lanka received more rainfall than the average in October, November and December and below normal rainfalls during February and March (Figure 3).

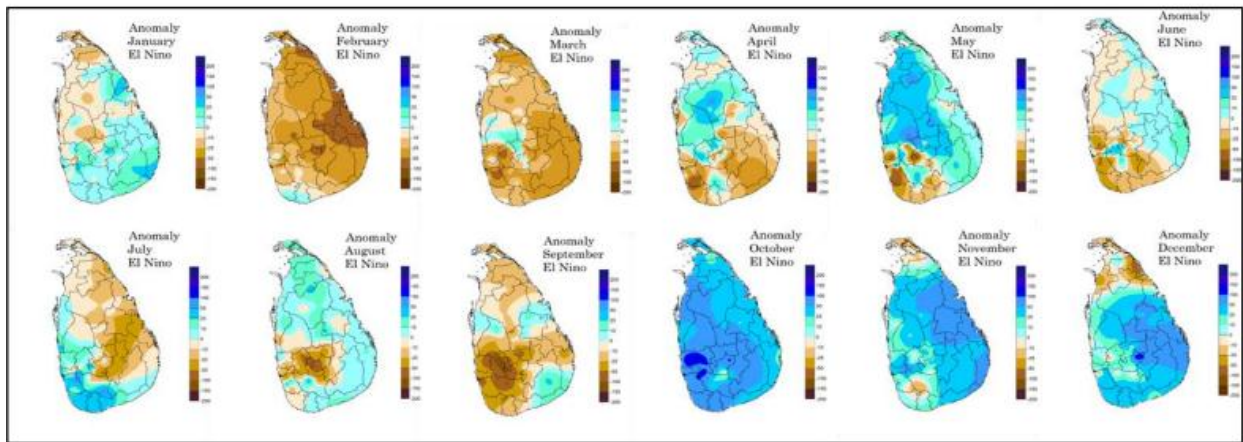


Figure 3. Average Monthly Rainfall anomaly during El Nino events (Hapuarachchi et al 2015),

## 2.2. Indian Ocean Dipole forecast

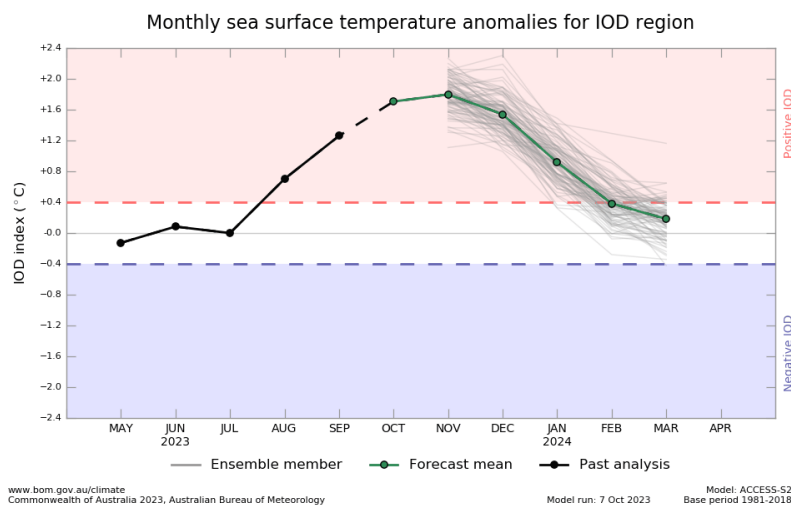


Figure 4. A positive IOD condition may develop in Indian ocean in the coming months.

A positive IOD event is underway. All international climate models surveyed by the Bureau of Meteorology Australia suggest the positive IOD event is likely to continue into at least December. (Figure 4). A robust statistical analysis revealed an apparent increase in cumulative seasonal rainfall, mean number of wet days and heavy rainfall events with the positive IOD events during second inter-monsoon season over wet zone (Abeyasekara et al. 2021). According to the research conducted by the department of Meteorology, rainfall during second inter-monsoon over the country was increased during positive IOD condition.

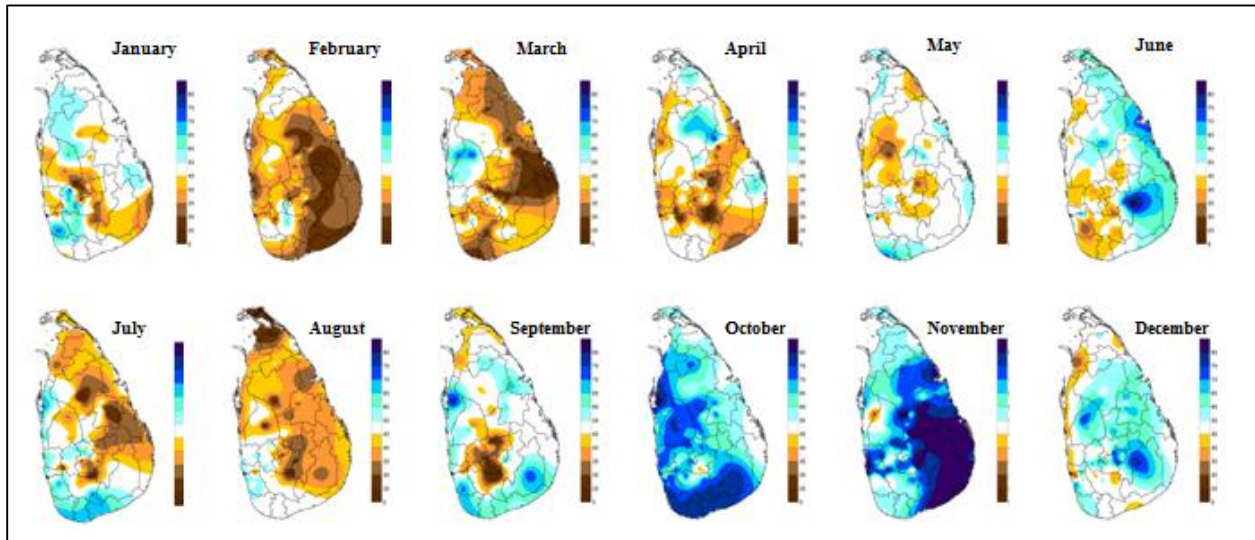


Figure 5. Average Monthly Rainfall anomaly during Positive IOD

**According to the international and local research findings and the forecasts from global climate models, there is a possibility for above normal rainfalls over most parts of the country during October to December. However it is noted that below normal rainfall are likely over Northern part of the country during December and January and the possibility for below normal rainfalls is higher over most parts during February and March during El Nino and Positive IOD conditions.**

In addition to that, there is higher possibility of developing low pressure systems, depressions and Cyclones over and vicinity of Sri Lanka during the October to December. Therefore, floods and landslides are likely during October to December.

Note: Seasonal forecast and monthly rainfall forecasts are updated each and every month and uploaded in [www.meteo.gov.lk](http://www.meteo.gov.lk).

## El Niño Years and Intensities

Based on Oceanic Niño Index (ONI)

Source-[Jan Null, CCM](#)

Updated thru July-August-September 2023

<b>El Niño</b>			
<b>Weak</b>	<b>Moderate</b>	<b>Strong</b>	<b>Very Strong</b>
<b>1952-53</b>	<b>1951-52</b>	<b>1957-58</b>	<b>1982-83</b>
<b>1953-54</b>	<b>1963-64</b>	<b>1965-66</b>	<b>1997-98</b>
<b>1958-59</b>	<b>1968-69</b>	<b>1972-73</b>	<b>2015-16</b>
<b>1969-70</b>	<b>1986-87</b>	<b>1987-88</b>	
<b>1976-77</b>	<b>1994-95</b>	<b>1991-92</b>	
<b>1977-78</b>	<b>2002-03</b>		
<b>1979-80</b>	<b>2009-10</b>		
<b>2004-05</b>			
<b>2006-07</b>			
<b>2014-15</b>			
<b>2018-19</b>			