I C P A C

IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for March 2018

1. INTRODUCTION

This bulletin reviews the March 2018 climate condition over the Greater Horn of Africa (GHA) region and highlights the May 2018 rainfall and temperature forecasts together with the socio-economic impacts associated with both the observed and the forecasted climate conditions.

There are six sections in this bulletin. The major highlights from both the observed and expected climate conditions are outlined in section2. Section 3 discussed the climate patterns that prevailed in the month of March 2018, while the dominant weather systems are discussed in the section 4. In section 5, the May 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from May 2018 climate forecasts are outlined in the last section.

For referencing within this bulletin, the GHA is generally divided into three sub-sectors: The equatorial sector lying approximately between -5^{o} and 5^{o} latitude, with the northern and southern sectors occupying the rest of the northern and southern part of the region respectively.

2. HIGHLIGHTS

Rainfall was mainly experienced in the southern sector, and the equatorial sector of the GHA. Western part of the equatorial sector, some places in the southern part of the northern sector of the GHA also received rainfall. Much of the equatorial sector, southern parts of the northern sector and northern sector recorded above normal rainfall conditions during the month of March 2018 (Figure 2 and Figure 3).

The northern part of the northern sector was warmer than the average condition for maximum temperature, while much of the equatorial sector of the GHA was cooler than the average conditions for maximum temperature (Figure 4a). Warmer than the average condition for minimum was experienced mainly in northern part of the northern sector. Southeastern part of the northern sector and north-central part of the equatorial sector of the GHA experienced cooler than the average condition for minimum temperature. Much of the rest of GHA recorded near the average condition for maximum and minimum temperature during the month of March 2018.

Some places in the equatorial sector and the southern sector of the GHA experienced high rainfall amounts leading to flooding. The general rainfall condition in the equatorial sector, southern sector, and southern part of the northern sector of GHA resulted in improvement in water and pasture

conditions resulting to prospects of good crop, and livestock productivity following the rainfall condition for the month of March 2018.

In March 2018, the Oceanic Nino Index (ONI), one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO) signal showed a negative signal (Figure 7a) and Indian Ocean Dipole (IOD), which is the signal of interaction between the ocean and the atmosphere in the Indian Ocean indicated positive phase of IOD (Figure 7b). The ONI is forecasted to transition from a negative to neutral phase in the coming few months to the mid of 2018, while the IOD shows more likelihood of persisting in the positive phase during this period.

In the month of May 2018, rainfall is expected to be concentrated over much of western and central equatorial sector and southern parts of the northern sector of the GHA (Figure 8a).

3. CLIMATE PATTERNS IN MARCH 2018

The rainfall amounts (Figure 1) and performance as compared to the Long Term Mean (1981-2010) using percentage of long term average (Figure 2) and Standardized Precipitation Index (SPI) (Figure 3) for March 2018 are provided in this section. The minimum (Figure 4b) and maximum (Figure 4b) temperature anomalies relative to Long term mean (2008-2016) are also given.

Rainfall performance

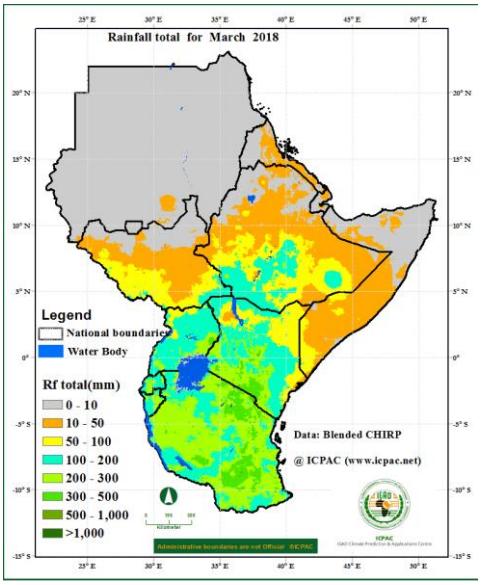

Figure 1: Spatial distribution of rainfall during the month of March 2018*(Data Source : Blended CHIRPS)*

The highest range of rainfall recorded was between 200mm and 300mm, which occurred in the south-central Kenya and eastern part of Tanzania.

Burundi, Rwanda, Uganda, Kenya and Tanzania: several parts of Uganda, Rwanda and Burundi, recorded rainfall of between 100mm and 300mm. Tanzania and much of Kenya recorded rainfall of between 100mm and 500mm except for eastern and northwestern part of Kenya. The south-central part of Kenya and northeastern and southern part of Tanzania recorded rainfall amounts of between 300mm and 500mm. Much of these areas experienced near normal to severely wet rainfall conditions. However some parts of north and south of Kenya experienced extremely wet conditions, while a few places in southern Burundi and southern Tanzania reported near normal to moderately dry conditions. Several parts of Kenya and much of eastern and part of western Tanzania showed improvement in rainfall performance as compared with the month of February.

South Sudan, Ethiopia Somalia: southern part of South Sudan, much of southern and central Ethiopia, and central and southern parts of Somalia recorded rainfall of between 10mm and 200mm with

southeastern South Sudan and southern Ethiopia recording between 100mm and 200mm of rainfall. Much of the rest of these areas recorded less than 10mm of rainfall. Several parts of South Sudan, western and southern parts of Ethiopia, and central and southern parts of Somalia experienced near normal to severely wet rainfall conditions. The central and northeastern part of Ethiopia recorded moderately dry to severely dry rainfall conditions. Southwestern Somalia and southeastern Ethiopia indicated an improved performance in rainfall conditions, while central to northeastern Ethiopia showed deterioration in rainfall performance as compared with February 2018.

Sudan, Eritrea, and Djibouti: Much of these areas recorded less than 10mm of rainfall, except for central Eritrea and part of Djibouti which recorded between 10mmand 50mm. These areas experienced near normal or generally dry rainfall conditions, except for central Eritrea which experienced below average rainfall, and Djibouti which experienced above average rainfall for the month of March.

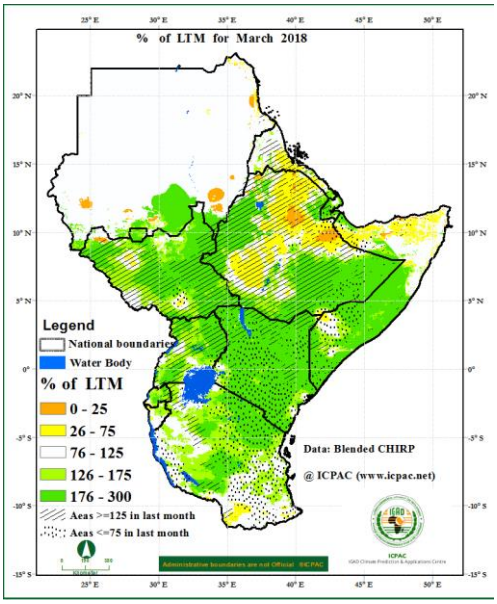

Figure 2: Percentage of average rainfall for March 2018 *(Data Source: Blended CHIRPS)*

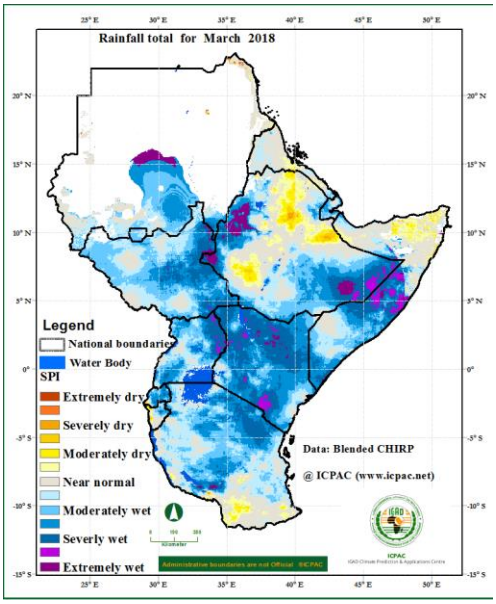

Figure 3: Standardized Precipitation Index for March 2018 *(Data Source: Blended CHIRPS)*

Temperature Conditions

The maximum temperature condition experienced during the month of March 2018 was that:

Sudan, and Eritrea: northern part of Sudan and northwestern and central Eritrea experienced conditions warmer than the average for maximum temperature

Ethiopia, Uganda, Kenya, Rwanda and Tanzania: southern Ethiopia, several parts of Kenya and Uganda, eastern Rwanda and northern Tanzania experienced conditions that were cooler than the average for maximum temperature.

Much of the rest of the GHA including **South Sudan Djibouti**, **Somalia**, and **Burundi** experienced near the average condition for maximum temperature.

The Minimum temperature condition experienced during the month of March 2018 was that:

Sudan, Eritrea and South Sudan: Much of northern and central Sudan, in northwest part of South Sudan and in western part of Eritrea conditions warmer than average for minimum temperature was recorded.

Djibouti, Ethiopia, Uganda, Kenya, and Somalia: A few places in western Djibouti, several parts of western and central Ethiopia, some areas in northern Somalia, western Uganda and in northwestern Kenya experienced cooler than the average condition for minimum temperature.

Much of the rest of the GHA recorded near the average condition for minimum temperature.

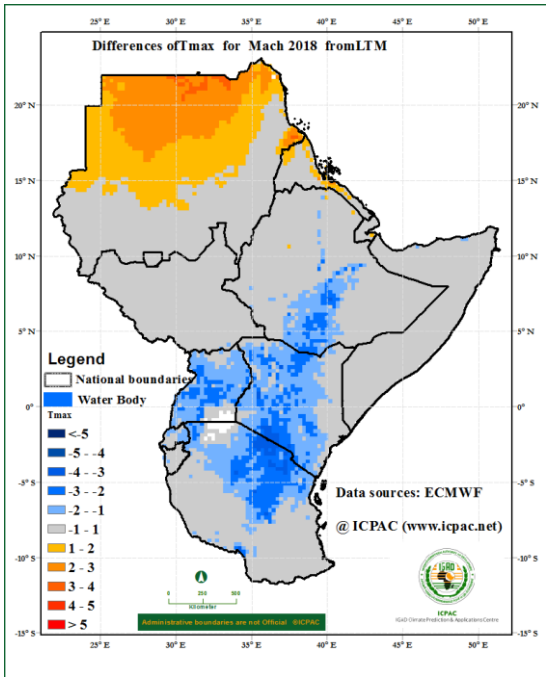

Figure 4a: Maximum temperature anomalies for March 2018 *f*rom LTM, 2008-2017 (*Data Source: ECMWF)*

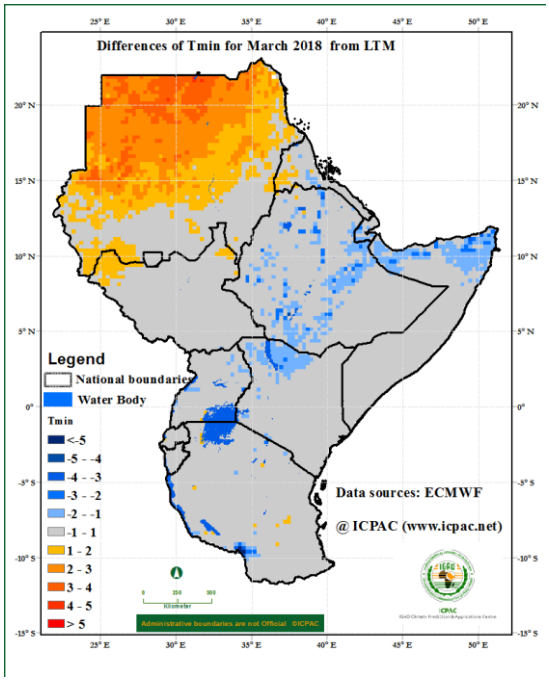

Figure 4b: Minimum temperature anomalies for March 2018 from LTM, 2008-2017 *(Data Source: ECMWF)*

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for March 2018 indicates that

South Sudan, Ethiopia, Uganda, Kenya, and Tanzania: Several areas in western South Sudan and in parts of eastern south Sudan, in parts of southern Ethiopia, northern Uganda, parts of north, central nd western Kenya, and northeastern Tanzania experience improvement in vegetative conditions as compared to the long term average.

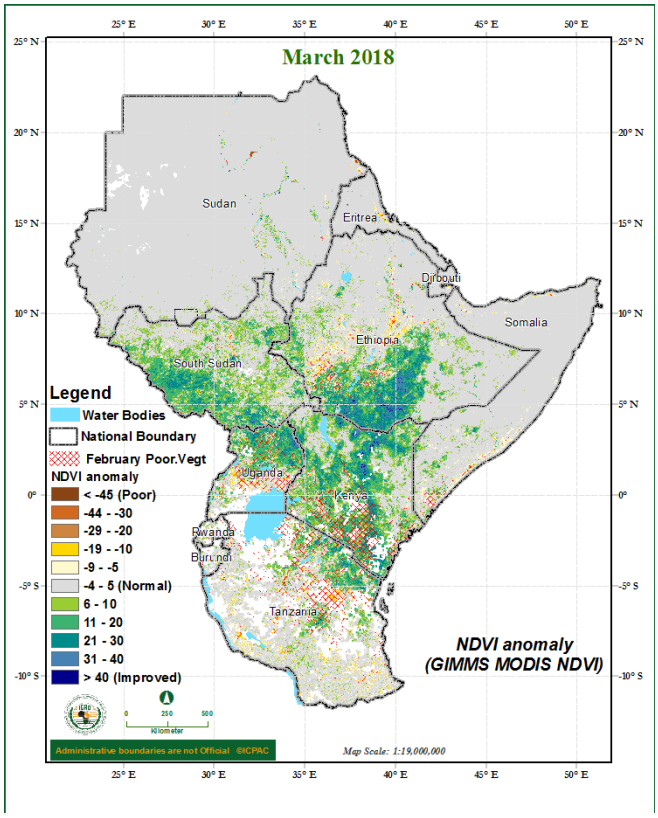

Figure 9: Normalized Difference Vegetation Index (NDVI) for March 2018 over the Greater Horn of Africa ***(Data Source: USGS-NASA*****)**

Much of the rest of the GHA region indicated little or no change in vegetative conditions as compared to the long term average for the month of March 2018. (Figure 9).

4. STATUS OF THE CLIMATE SYSYEMS

The Sea Surface Temperature (SST) anomaly during the month for the period of 4th to 30th March 2018 showed that central equatorial Pacific Ocean stretching towards the eastern equatorial Pacific region (Niño 4 to Niño 1&2 areas), was dominated by cooler than average SST anomaly, with the area stretching from central towards western equatorial Pacific Ocean showing warmer than average SST (Figure 5), this situation presents a negative Oceanic Nino Index (ONI) and a La Niña phase (Figure 6) models show an increased likelihood of transition from a negative NIÑO phase to a neutral phase through to the mid second quarter of the year 2018. Near average to warmer than average SST conditions dominated western sides of equatorial Indian Ocean with average SST conditions over the eastern equatorial Indian Ocean (Figure 5). This pattern has presented a positive phase of the Indian Ocean Dipole (IOD) (Figure 7). Models show transition of the IOD from a positive phase to a neutral phase through to the end of second quarter of the year2018.

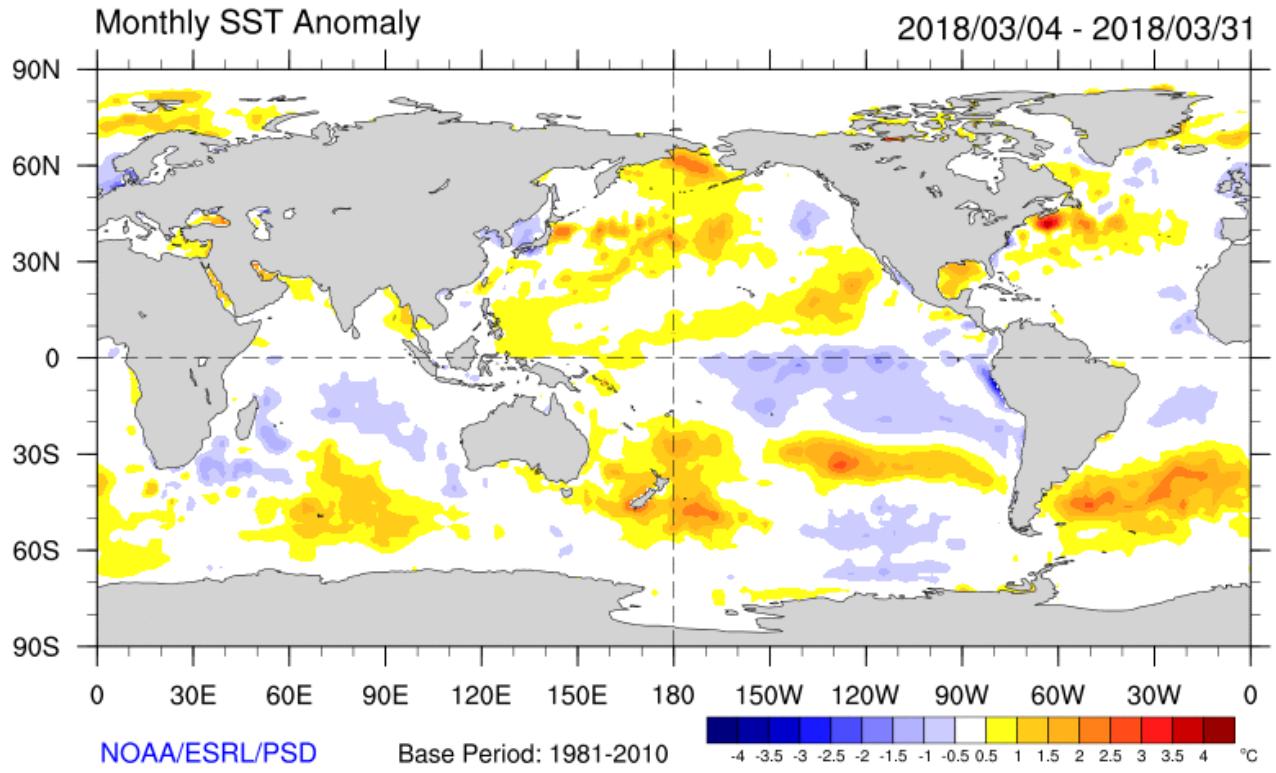

Figure 5: Sea Surface Temperature anomalies for the period 04 March 2018 to 30 March 2018 (*Source: NOAA/ESRL/PSD***)**

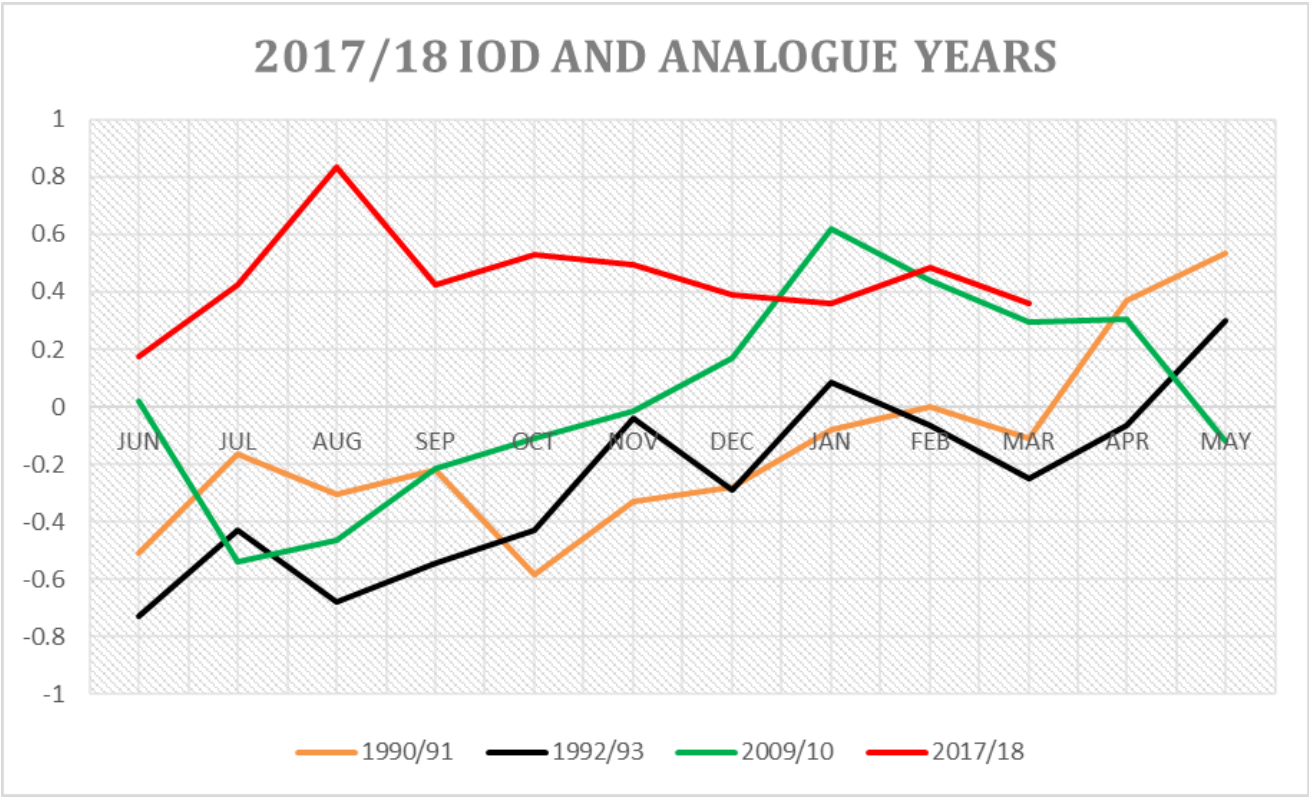

Figure 6: The Indian Ocean Dipole (IOD) during 2017/18 and analogue years.

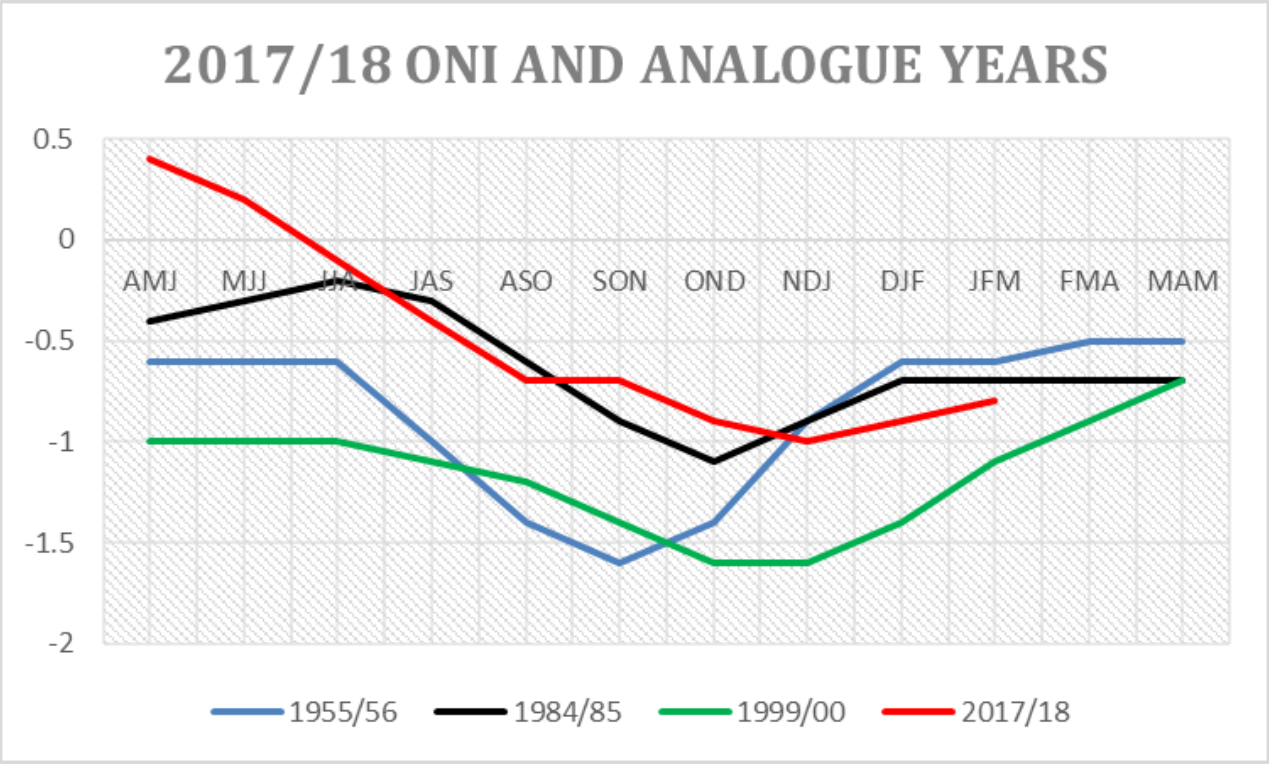

Figure 7: The Oceanic Nino Index (ONI) during 2017/18 and analogue years.

5. CLIMATE OUTLOOK FOR MAY 2018

The climate outlook for temperature and precipitation for the month of May 2018 are generated from the GHA region customized WRF model.

The May 2018 rainfall forecast

During the month of May 2018, rainfall will be concentrated over much of Uganda, western and central Kenya, South Sudan, and western and central Ethiopia. Parts of Rwanda, Somalia, and northern and southern Tanzania, are also likely to record rainfall activities (Figure 8a). Much of the areas covering Sudan, west and central Eritrea, Djibouti, northern Ethiopia, eastern Kenya, southwestern Somalia, much of Burundi and several parts of Tanzania are likely to remain generally dry or record small amounts of rainfall.

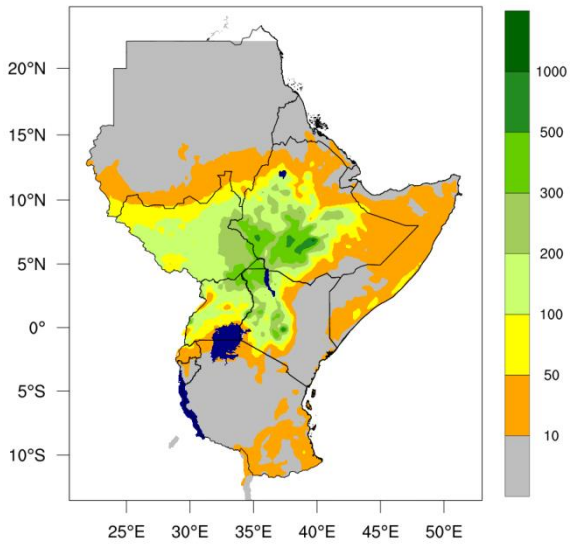

Figure 8a: Forecast of rainfall total for May 2018

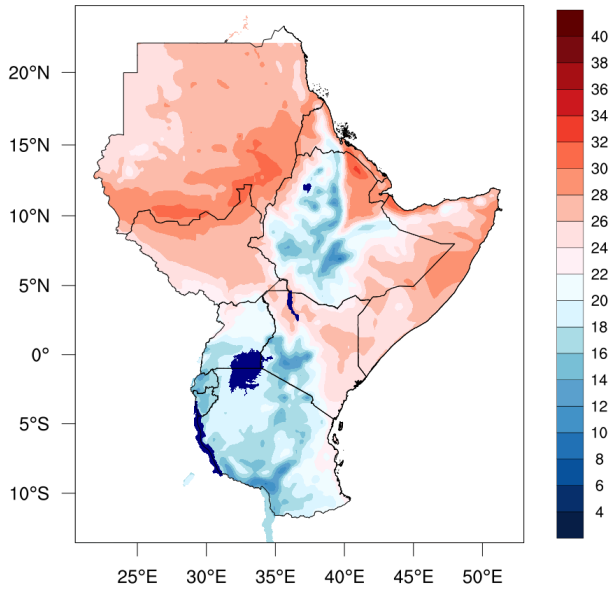

Figure 8b: Mean temperature forecast for May 2018.

The May 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over western and central Ethiopian highlands, several parts of Uganda, western and central Kenya, over much of Rwanda, Burundi, and Tanzania. Much of the rest of the GHA is likely to record average temperatures warmer than 22°C (Figure 8b).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climate conditions in March 2018 and those from the May 2018 rainfall and temperature forecast are provided below.

Impacts of observed climate conditions during March 2018

During the month of March 2018, several areas especially in the central and southeastern parts of the northern sector, central and southwestern parts of the equatorial sector as well as northwestern parts of the southern sector of the GHA experienced good rainfall performance leading to improved pasture and water conditions during March 2018. Some areas in the equatorial and southern sector including parts of Kenya, Uganda, and Tanzania experienced flooding conditions which led to loss of lives and livelihood, destruction to infrastructure, and reported cases of water related diseases.

Potential impacts for May 2018 climate outlook

In the month of May 2018, the forecasted climate is likely to result to improved water availability, crop and pasture conditions leading to good prospects for crop and livestock performance especially in much of the equatorial sector and southern parts of the northern sector of the GHA. Parts of

central and western Kenya, southeastern South Sudan, and southwestern Ethiopia are likely to experienced high rainfall amounts which might lead to localised flooding and the associated impact.

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