IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, August 2017

1. INTRODUCTION

This bulletin reviews the August 2017 climate condition over the Greater Horn of Africa (GHA) region and highlights the October 2017 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 provides climate patterns that prevailed in the month of in august 2017 are discussed, while the dominant weather systems are discussed in the section 4. In section 5, the October 2017 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from October 2017 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° and 5° latitude, with the northern and southern sectors occupying the rest of the northern and southern parts of the region respectively.

2. HIGHLIGHTS

Rainfall performance for August was generally above to near the average conditions in several part northern sector of the GHA region, except in a few areas in the south-central and southeastern parts of the northern sector of the GHA (Figure 1). The southwestern, north-central and eastern parts of the equatorial sector, and eastern and southern parts of the southern sector of the GHA experienced below the average rainfall conditions. However central parts of the equatorial sector of the GHA showed above average rainfall performance during August 2017(Figure 2 and Figure 3).

Warmer than the average maximum and minimum temperatures conditions was experienced mainly over much parts of northern sector of GHA (Figure 4a and 4b).

The rainfall conditions in the GHA region during the month of August 2017 continued to bring with it a relief in some of the areas especially in the northern sector and central equatorial sector of the GHA. However a few places especially in the western, parts of the equatorial sector as well as south-eastern parts of the northern sector continue to experience impacts of depressed rainfall conditions that has led to deterioration of water and pasture conditions, poor prospect of crop and livestock production, and general water stress as direct negative impacts of depressed rainfall conditions (Figure 5).

In August 2017, the Oceanic Nino Index (ONI) as one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO) signal showed a neutral phase of ENSO and Indian Ocean Dipole (IOD), which is the signal of interaction between the ocean and the atmosphere in the Indian Ocean showed positive phase of IOD. The ONI is forecasted to persist in a neutral phase in the coming few months with an increasing chance of progression to the negative phase (Figure 7a and 7b).

October 2017 forecast indicates that, rainfall is likely to be concentrated in southern parts of the northern sector, and over western, central and eastern parts of the equatorial sector of the GHA region (Figure 8a and 8b).

3. CLIMATE PATTERNS IN AUGUST 2017

The rainfall amounts and performance as compared to the Long Term Mean (1981-2010) using percentage of long term average and Standardized Precipitation Index (SPI) for August 2017 are provided in this section. The minimum and maximum temperature anomalies (2008-2016) are also given.

RAINFALL AMOUNTS AND PERFORMANCE DURING AUGUST 2017

Rainfall amounts in August 2017

During the month of August 2017, areas covering much of central and southern parts of Sudan, south-western and western Eritrea, South Sudan, and Uganda; much of Ethiopia except for the southern and southeastern parts; and in parts of western Kenya recorded rainfall amount greater than 100mm. Areas covering much of Djibouti, northern and southeastern Somalia, coastal Kenya, and southern Uganda western Burundi, and in parts of north and north-eastern Tanzania recorded rainfall amounts between 10 and 50mm. The western and north-western parts of Ethiopia, southwestern Sudan, in north and western parts of South Sudan, as well as a few areas in northern Uganda and western Kenya rainfall amounts greater than 200mm was recorded.

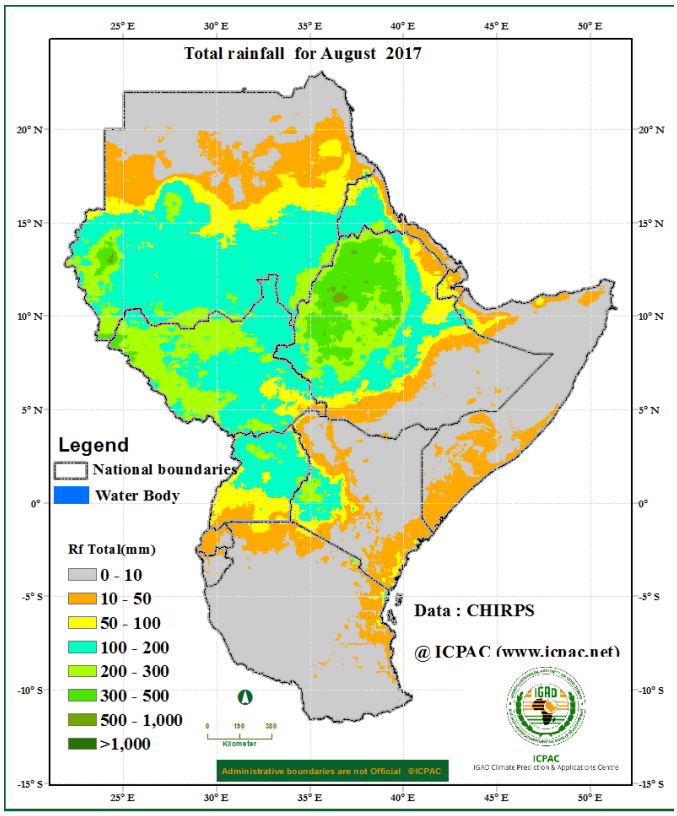

Figure 1: Spatial distribution of rainfall during the month of August 2017*(Data Source : CHIRPS)*

Rainfall amounts less than 10mm was recorded over much of northern part of Sudan, coastal Eritrea, eastern Djibouti, southern and southeastern Ethiopia, in much of Somalia, in eastern Burundi; in

much of Rwanda, northern, eastern and south-central Kenya, and Tanzania during the month of August 2017 (Figure 1).

Rainfall severity in the month of August 2017

Figure 2 shows the amount of rainfall received expressed as percentage of long term average (1981-2010) for the month of August while Figure 3 shows the SPI for the same month.

In August 2017, rainfall greater than 125% of the long term average was recorded in several areas Sudan, western Eritrea, Djibouti, northern and southern parts of Ethiopia, northern and central parts of Somalia, in southeastern Uganda and in western Kenya. Northwestern part of Sudan, southeastern South Sudan, southeastern Ethiopia, southeastern Somalia, northwestern and coastal parts of Kenya, southwestern Uganda, in much of Rwanda and Burundi, and in northwestern and eastern Tanzania rainfall less than 75% of the long term average (Figure 2) was recorded. Much of the rest of the GHA region recorded rainfall of between 75% and 125% of the of the long term average for the month of August. Some areas covering southwest of Sudan, southeastern Ethiopia, northwestern, and western Kenya, southeastern Uganda, and in northwestern Tanzania showed poor performance of rainfall as compared to the month of July 2017. A few areas in western Sudan and central Somalia has shown improvement as compared to the previous month.

Moderately wet to extremely wet rainfall conditions were observed in much of northern and central Sudan, in north, west and southern parts of Ethiopia, much of Djibouti, western Eritrea northern Somalia, north-central and southwestern South Sudan, southwestern Uganda and in western and central parts of Kenya. A few areas in southwest South Sudan, eastern Ethiopia, southern Somalia, southwestern Uganda, in much of Burundi, northern Rwanda, and in northwestern and eastern Tanzania showed moderately dry to severely dry rainfall conditions. The rest of the GHA region recorded near normal rainfall conditions.

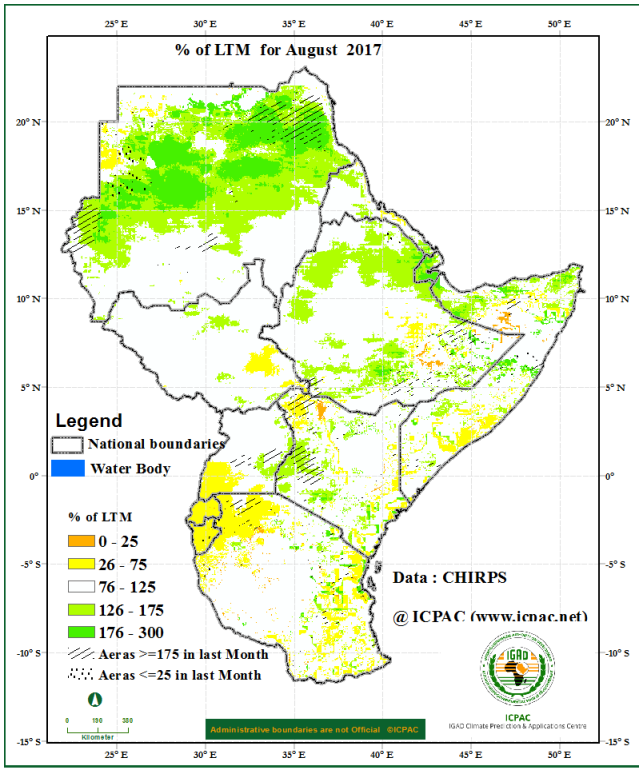

Figure 2: Percentage of average rainfall for August 2017 *(Data Source: CHIRPS)*

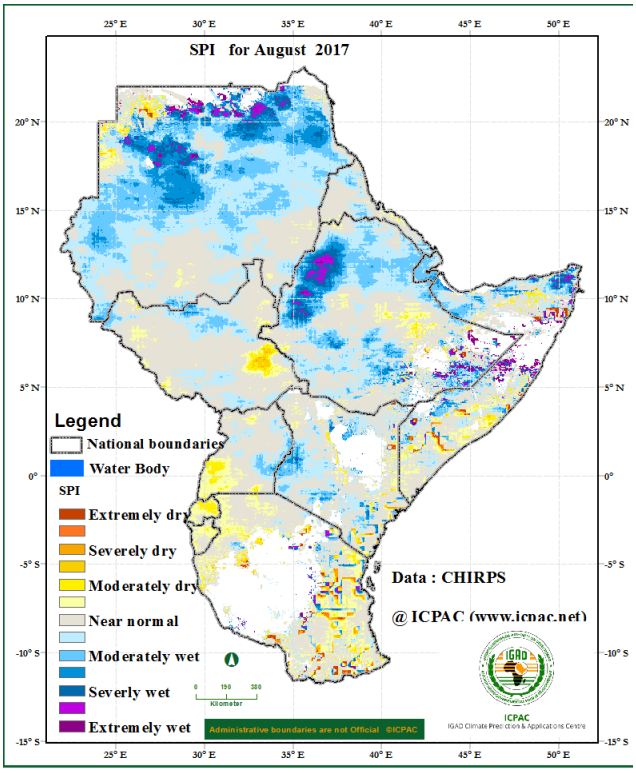

Figure 3: Standardized Precipitation Index for August 2017 *(Data Source: CHIRPS)*

Temperature Conditions

During August 2017, warmer than the average maximum temperatures conditions was experienced mainly over much of southern part of Sudan, South Sudan, south-western Eritrea, in northeastern and southern parts of Somalia; and in few parts of eastern Uganda, western, southeastern and central parts of Kenya, and in northern, central and southern Tanzania (Figure 4a). The rest of the GHA recorded near average maximum temperature.

Much of the Sudan except for area in southwestern part, in northern part of South Sudan, western Eritrea, northeastern Somalia; several parts of Kenya and Tanzania; and few isolated areas in central Ethiopia, southern Eritrea, southern Uganda and southern and eastern Burundi recorded above the average minimum temperature conditions in the month of August 2017. The rest of the GHA recorded near the average conditions for the minimum temperature (Figure 4b).

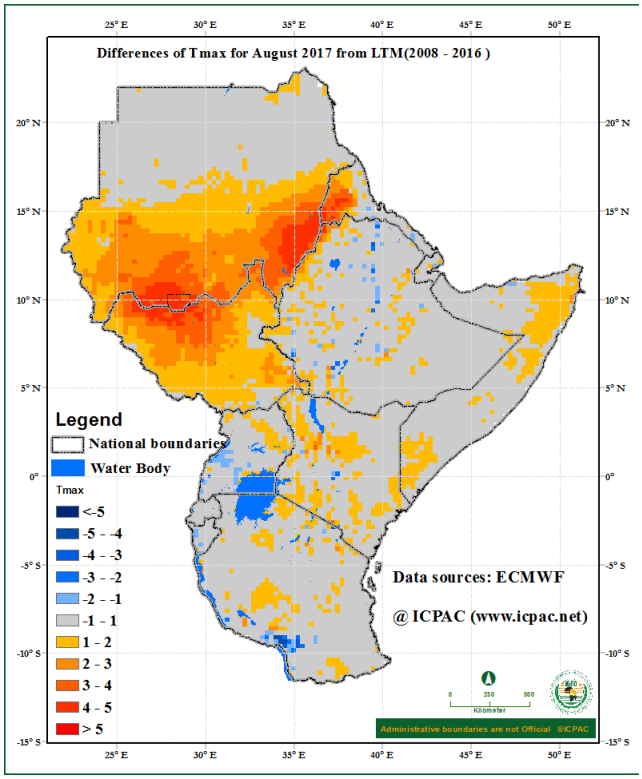

Figure 4a: Maximum temperature anomalies for August 2017 *f*rom LTM, 2008-2016 (*Data Source: ECMWF)*

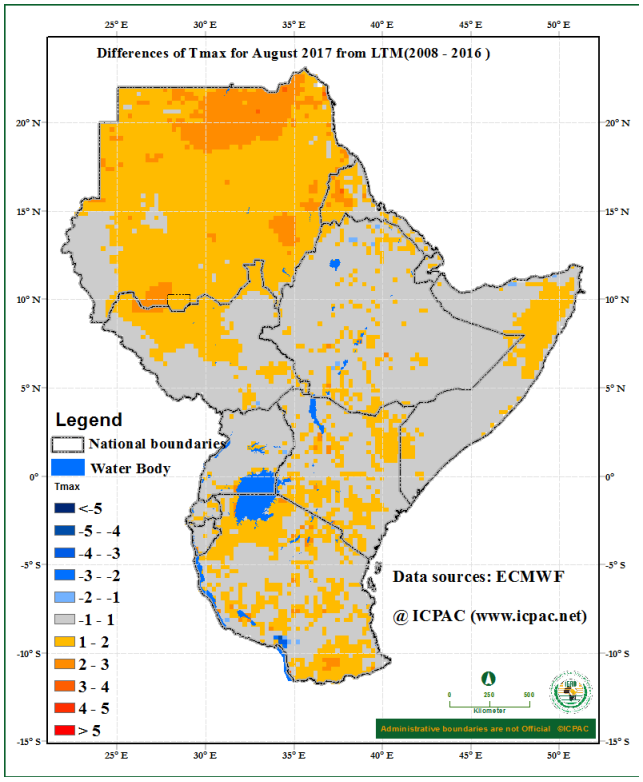

Figure 4b: Minimum temperature anomalies for August 2017 from LTM, 2008-2016 *(Data Source: ECMWF)*

Vegetation Condition Indicators and Associated Impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for August 2017 indicated much of the GHA region indicated little or no change in vegetative conditions as compared to the long term average of the same month. However, some areas in the southern parts of Sudan, southwestern Eritrea, eastern margins of central Ethiopia, southeastern Somalia, southern Uganda, in several parts of Burundi, northern parts of Tanzania, and in parts of western and coastal Kenya showed deterioration in vegetative conditions as compared to the long term average. Improvement in vegetative conditions as compared with the long term average was observed mainly in eastern South Sudan, northern and northeastern Uganda, in northwestern and central parts of Kenya, and eastern and southern Tanzania (Figure 8).

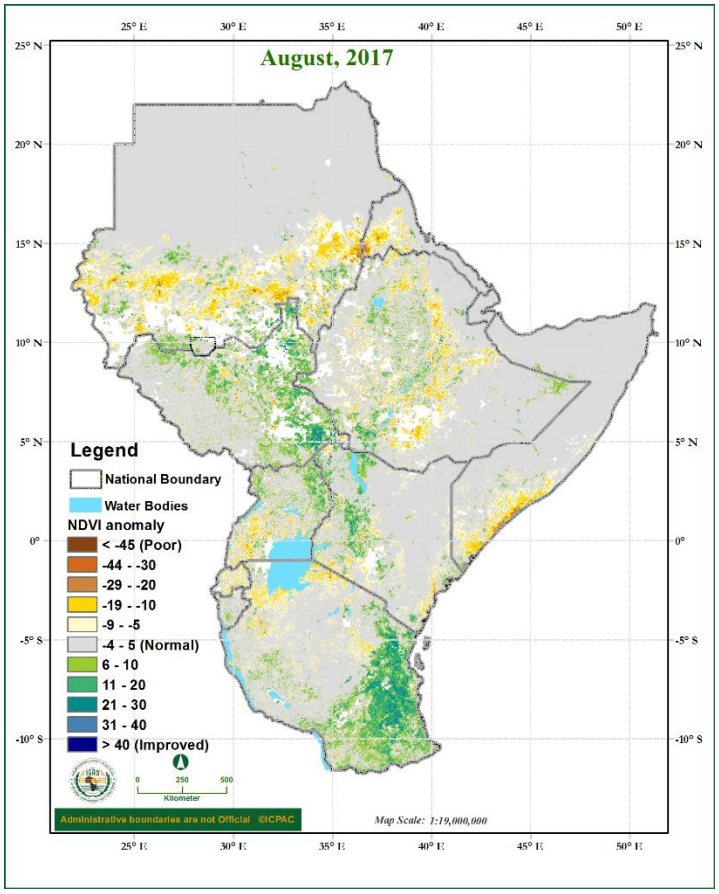

Figure 5: Normalized Difference Vegetation Index (NDVI) for August 2017 over the Greater Horn of Africa *(Data Source: USGS-NASA)*

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the period 20 August – September 16, 2017 showed that over central equatorial Pacific Ocean stretching towards the eastern equatorial Pacific region (Niño 4 to Niño 1&2 areas), cooler than average to near average SST anomaly was observed, with the area stretching from central towards western equatorial Pacific Ocean recording warmer than average SST (Figure 5), however this situation still currently presents a neutral El Niño Southern Oscillation (ENSO) phase (Figure 6b) however models show an increased likelihood of Negative ENSO towards the end of the year 2017. Near average to cooler than average SST conditions dominated eastern side of equatorial Indian Ocean (Figure 5) with much of the central to western equatorial Indian Ocean experiencing warmer to near average SST. This pattern has presented a positive phase of the IOD (Figure 6).

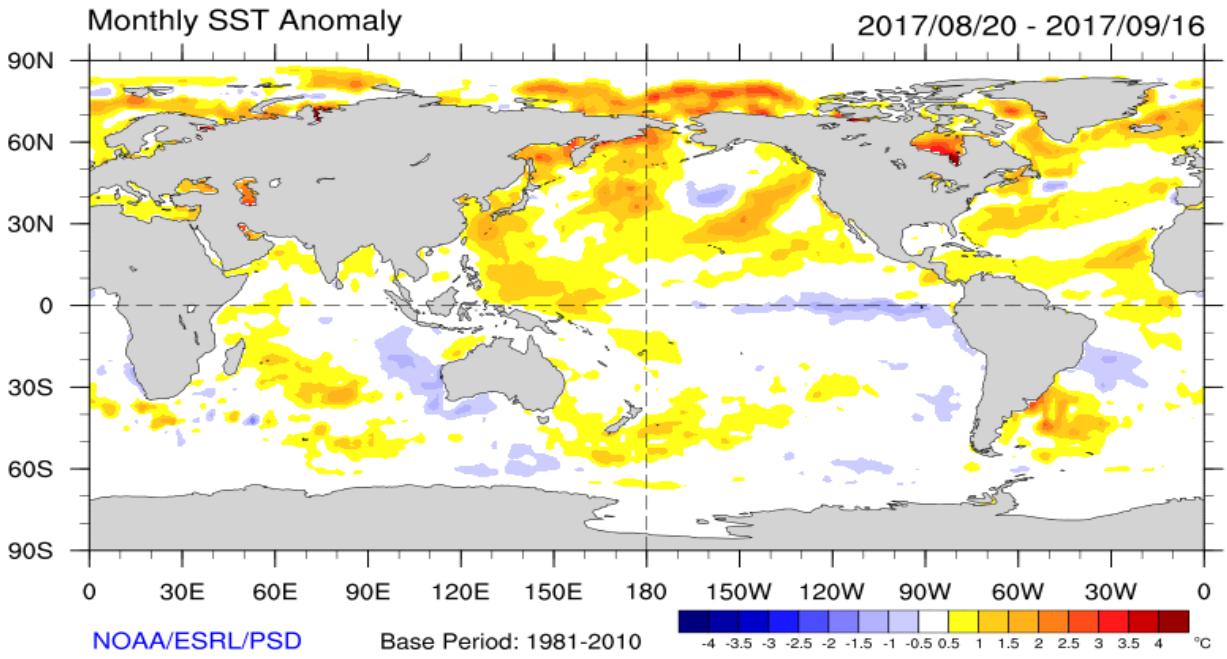

Figure 6: Sea Surface Temperature anomalies for the period 20 August to 16 September 2017 (*Source: NOAA/ESRL/PSD*)

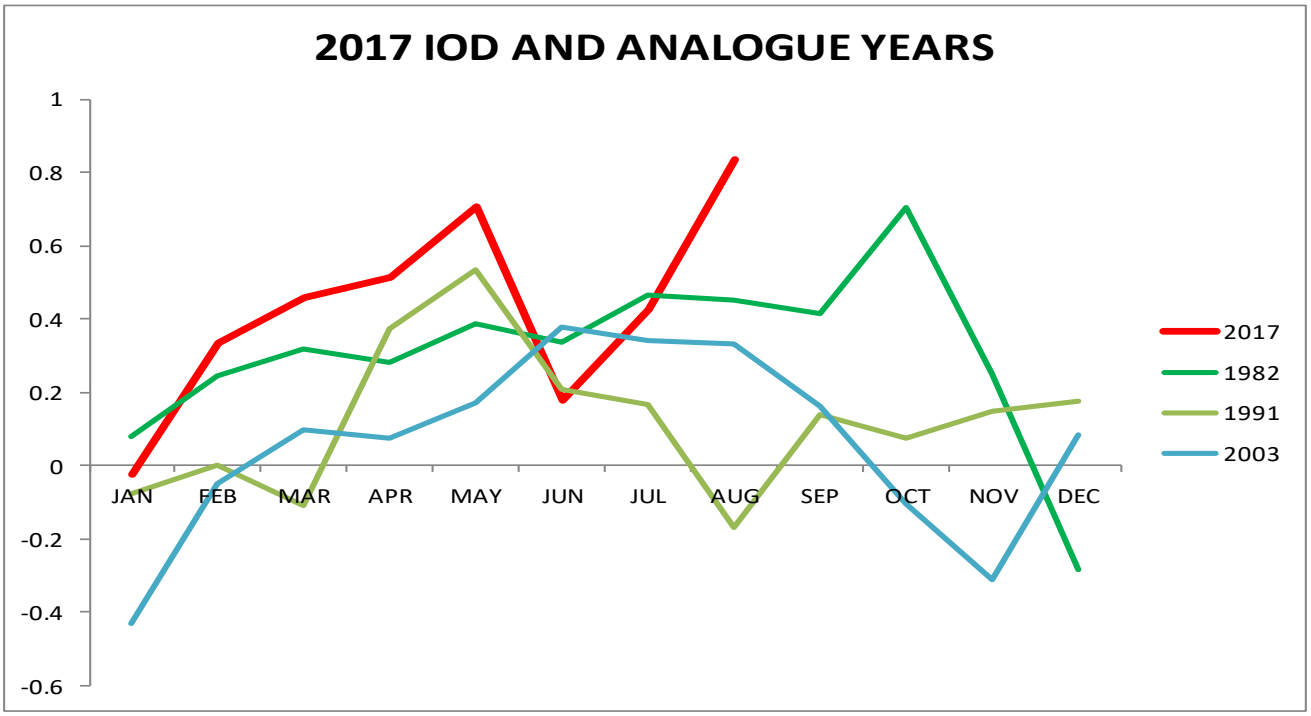

Figure 7a: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

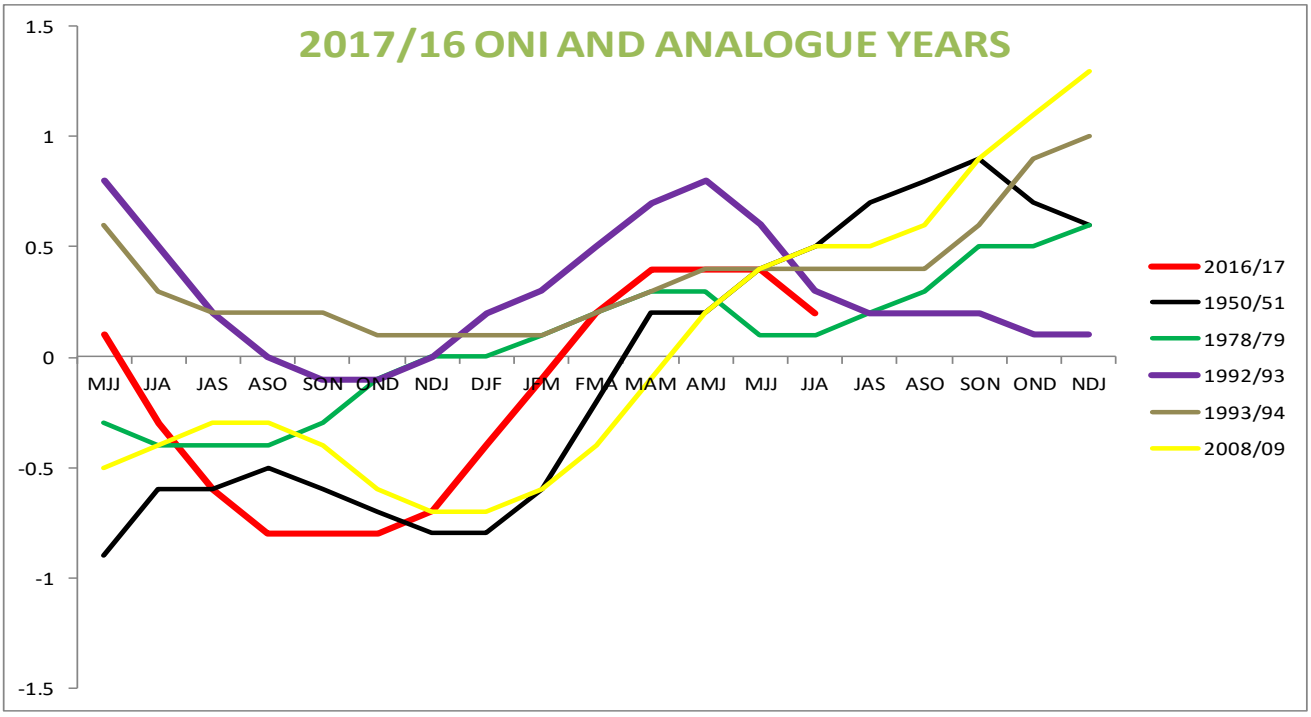

Figure 7b: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR OCTOBER 2017

The climate outlook for temperature and precipitation for the month of October 2017 are generated from the GHA region customised WRF model.

The October 2017 rainfall forecast

In the month of October 2017, much of the GHA is likely to experience rainfall except for the northern parts of Sudan, much of Eritrea, parts of northern Ethiopia and in southern parts of Tanzania. Areas covering south of Sudan; over much of South Sudan, Somalia, Djibouti, western and southern parts of Ethiopia, Uganda, Rwanda Burundi; in several parts of Kenya and northern parts of Tanzania are likely to record more than 50mm of rainfall (Figure 7a). More than 200mm of rainfall is likely to be recorded in several areas of South Sudan, southern parts of Ethiopia, over much of Somalia, Uganda, Rwanda, Burundi, western and northern Kenya, and northwestern Tanzania.

The October 2017 Temperature forecast

Average temperature of more than 22°C is likely to be observed in much of the GHA region except for some areas in western and central Ethiopia, northern Somalia, southwestern Eritrea, western and central Kenya, southern and eastern Uganda, over much of Rwanda and Burundi, and in parts of north and central Tanzania. The warmest temperatures exceeding 30 °C is likely to be experienced in the southern and western parts of Sudan, western and southern parts of Eritrea, and in eastern parts of Kenya.

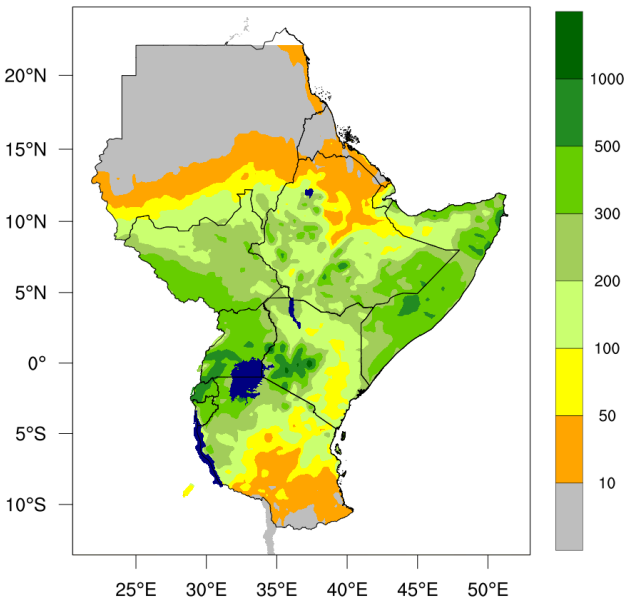

Figure 8a: Forecast of rainfall total for October 2017

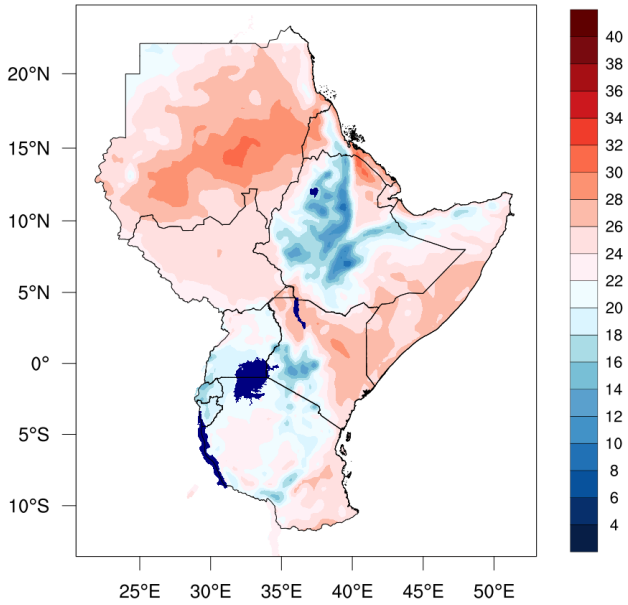

Figure 8b: Mean temperature forecast for October 2017.

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed rainfall conditions and those from the October 2017 rainfall and temperature forecast are provided below.

Impacts of observed climate conditions during August 2017

During the month of August 2017, a few places in the GHA especially in the southwest and eastern part of the equatorial sector which experienced depressed rainfall and related impacts that has led to continued water stress, poor pasture and crop performance, there is reported cases of climate related diseases and also high temperature related stress especially in some areas west of the northern sector of the GHA.

However, some areas in the northern sector have reported improved pasture and water conditions, and receiving a substantial amounts of rainfall with good and healthy crops which have acted as a relief from the previously dry conditions, some incidences of flooding were reported in few isolated areas over the northern sector of GHA especially parts of Sudan during August 2017.

Potential impacts for October 2017 climate outlook

In the month of October 2017, 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 southern parts of the northern sector, and in much of western, central and eastern parts of the equatorial sector of the GHA. However some parts especially in eastern, central and southwestern equatorial sector of the GHA are likely to experienced high rainfall which might lead to flooding and associated impact.

For more information contact

ICPAC P.O. Box 10304, 00100 Nairobi,
KENYA;

Tel: +254-020-3514426

E-mail: director@icpac.net