I C P A C

IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for November 2017

1. INTRODUCTION

This bulletin reviews the November 2017 climate condition over the Greater Horn of Africa (GHA) region and highlights the January 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 provides climate patterns that prevailed in the month of in November 2017 are discussed, while the dominant weather systems are discussed in the section 4. In section 5, the January 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from January 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° 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 November was below normal conditions mainly in southeastern parts of the northern sector, and in a few areas in the western and eastern parts of the equatorial sector of the GHA. While the rest of the GHA experienced near normal to above normal rainfall conditions during November 2017(Figure 2 and Figure 3).

Warmer than the average maximum temperatures conditions was experienced mainly over southwestern parts of northern sector, extending to northwestern part of the equatorial sector, also in a few parts of central and eastern equatorial sector and in central and southern parts of the southern sector of of GHA during the month of November 2017 (Figure 4a).Northern parts of Sudan, and in a small portion of central Somalia and southwestern Tanzania cooler than the average for maximum temperatures was recorded. Much of the rest of the GHA experienced near the average condition for maximum temperature. Warmer than the average for minimum temperatures conditions was experienced mainly over southwestern parts of northern sector of GHA during the month of November 2017 (Figure 4a).Much of the rest of the GHA experienced near the average condition for minimum temperature.

Improvement in water and pasture conditions resulting to prospects of good crop and livestock productivity and commencement of planting season especially in some parts of the equatorial and southern sector of the GHA during the rainfall in the month of November 2017. However A few places

especially in the eastern part of the equatorial sector of the GHA experience impacts of depressed rainfall conditions that has led to deterioration of water and pasture resources, and general water stress as direct negative impacts of depressed rainfall conditions. A few areas in the equatorial sector experienced flooding which led to the disruption of infrastructure and loss of livelihood.

The Oceanic Nino Index (ONI) as one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO). In November 2017, the signal showed a negative phase depicting a weak La Nina (Figure 7a). The 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 (Figure 7b). The ONI is forecasted to persist in a negative phase in the coming for much of the early quarter of the year 2018 and the IOD shows more likelihood of persisting in the positive phase during this period.

In the month of January 2018, rainfall is expected over much of southern sector and southern western parts of the equatorial sector of the GHA. Much of the rest of GHA are also likely to remain generally dry or record some minor rainfall (Figure 8a) activities.

3. CLIMATE PATTERNS IN NOVEMBER 2017

This section provide 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 November 2017. The rainfall data is from CHIRPS data blended with station data. The minimum and maximum temperature anomalies (2008-2016) are also given obtained from ECMWF.

Rainfall amounts in November 2017

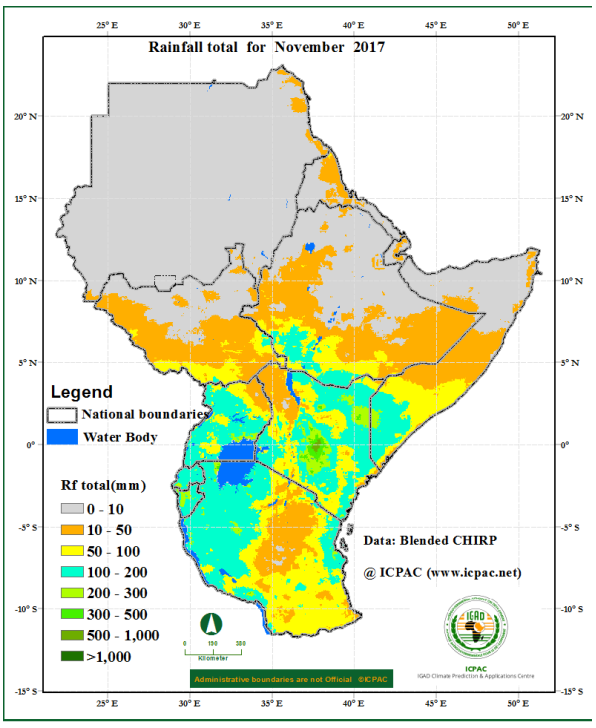

Figure 1: Spatial distribution of rainfall during the month of November 2017*(Data Source : CHIRPS)*

During the month of November 2017 rainfall is mainly expected in parts of equatorial and southern sectors of the GHA. Areas covering central and northeastern Kenya, northwestern Burundi, southeastern Uganda, and in isolated parts in northwestern Tanzania rainfall exceeding 200mm was recorded. With central Kenya recording more than 500mm of rainfall representing the highest range of rainfall recorded in the month of November 2017.

Much of western and southern parts of Uganda, Rwanda, Burundi; and in parts of western, central, northeastern and coastal Kenya, southwestern Somalia, and northwestern and northeastern Tanzania recorded rainfall exceeding 100mm. The rest of the GHA recorded between 10mm and 100mm of rainfall. (Figure 1).

Rainfall severity in the month of November 2017

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

In November 2017, southern Eritrea, north, central and eastern Ethiopia, northern parts of Somalia northwestern and southwestern South Sudan, western parts of Uganda, western and southeastern parts of Kenya, and in few areas in eastern Tanzania rainfall less than 75% of the long term average was recorded. Over southern parts of Ethiopia, much of northern Kenya, northeastern Uganda, central and southern Somalia, eastern and southern Rwanda, north, central and southern parts of Tanzania rainfall of exceeding 125% of the long term average for the month of November was recorded. The rest of the GHA recorded rainfall of between 75% and 125% of the long term average.

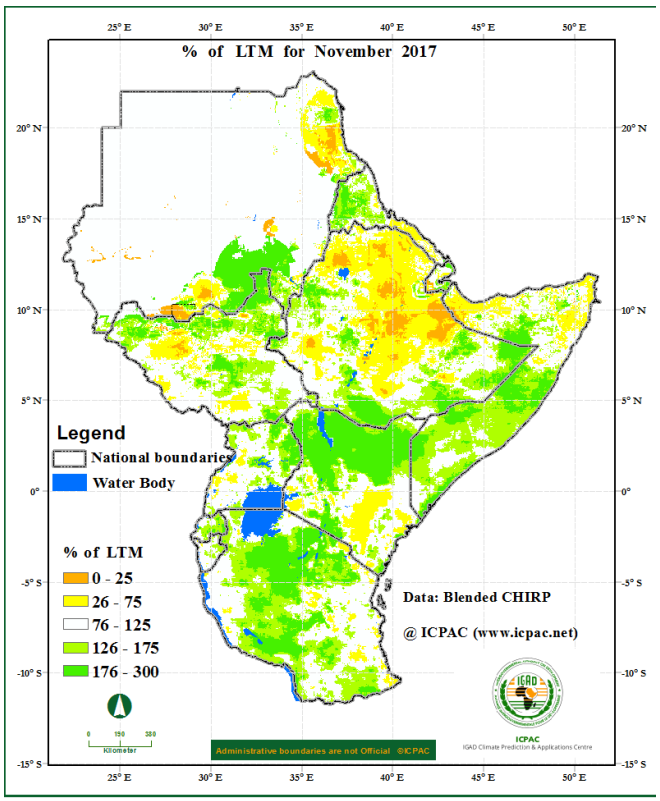

Figure 2: Percentage of average rainfall for November 2017 *(Data Source: CHIRPS)*

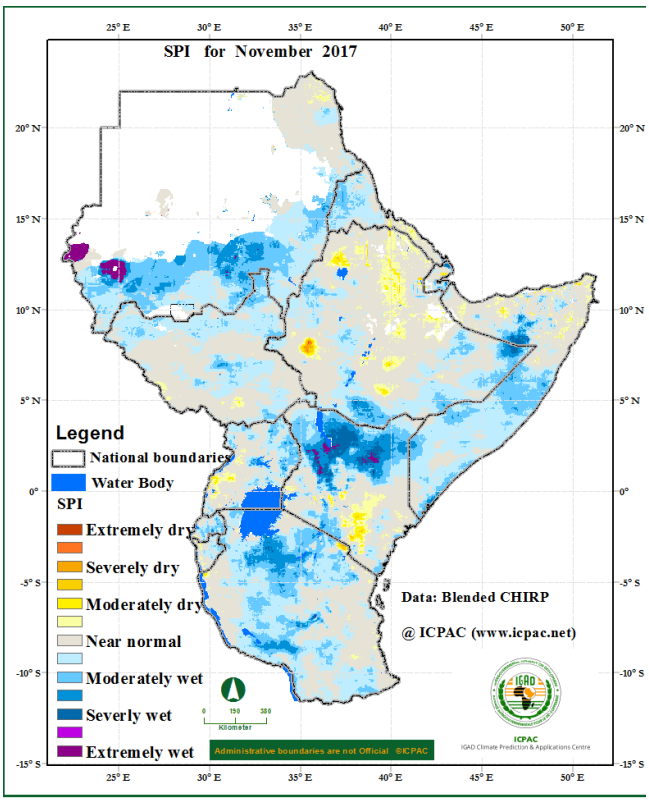

Figure 3: Standardized Precipitation Index for November 2017 *(Data Source: CHIRPS)*

Southern parts of Sudan, western Eritrea, parts of north and central South Sudan, southern part of Ethiopia, central and southern Somalia, northern and eastern parts of Uganda, much of northern and south-central Kenya, southern and eastern parts of Rwanda, northwestern Burundi, as well as northern western and southern parts of Tanzania moderately wet to extremely wet conditions. Much of the rest of the GHA region recorded normal conditions except for a few parts in north, east and western Ethiopia, western Uganda, and eastern Kenya during the month of November 2017.

Temperature Conditions

During November 2017, southern parts of Sudan, much of South Sudan, parts of southwestern Eritrea, western, north and eastern parts of Ethiopia, in parts of northwest and southeast of Uganda, in eastern parts of Kenya and in parts of central Tanzania warmer than the average for maximum temperature conditions was experienced. Cooler than the average for maximum temperature was recorded in the northern part of Sudan, and in a few isolated areas in western Ethiopia, central Somalia, and southwestern Tanzania. Much of the rest of the GHA recorded near the average for maximum temperature (Figure 4a).

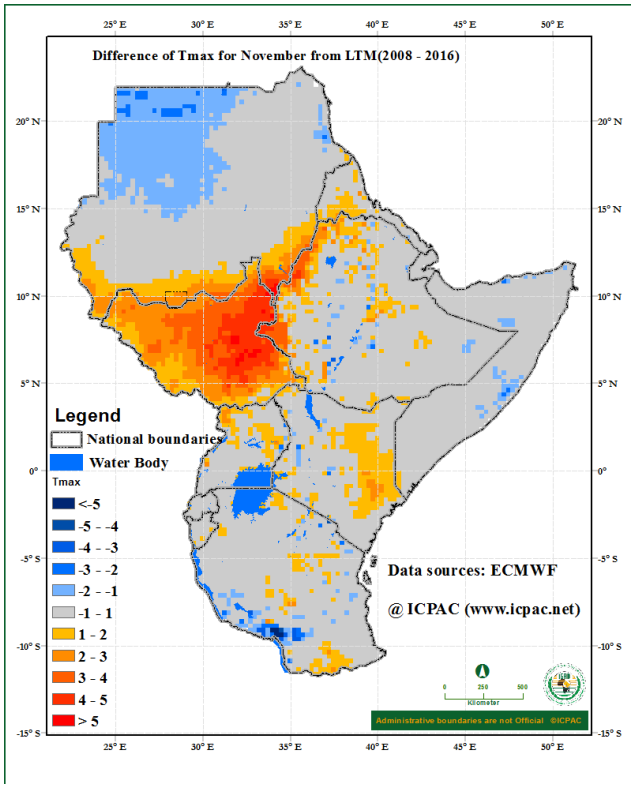

Figure 4a: Maximum temperature anomalies for November 2017 *f*rom LTM, 2008-2016 (*Data Source: ECMWF*

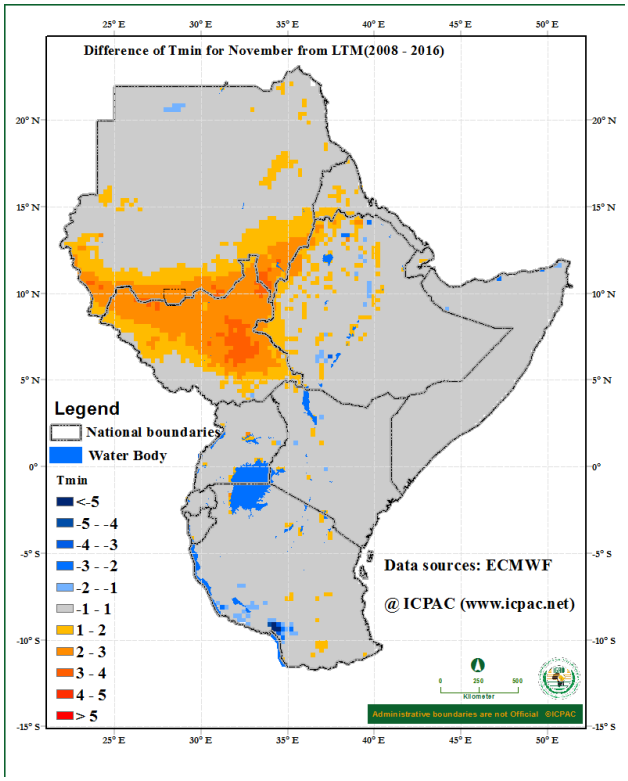

Figure 4b: Minimum temperature anomalies for November 2017 from LTM, 2008-2016 *(Data Source: ECMWF)*

Warmer than the average conditions for minimum temperatures was recorded mainly in southern parts of Sudan, over much of South Sudan, in part of southwest Eritrea, and western Ethiopia. The rest of the GHA recorded near the average conditions for the minimum temperature during the month of November 2017 (Figure 4b).

Vegetation Condition Indicators and Associated Impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for November 2017 indicated that some areas covering southeastern Ethiopia, southern Somalia, and a few parts in north and central Tanzania 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 much of South Sudan, southwestern, central and eastern parts of Ethiopia, in northern and eastern Uganda, northwestern and central parts of Kenya, and western and eastern parts of Tanzania. (Figure 9). The rest of the GHA region indicated little or no change in vegetative conditions as compared to the long term average of the same month.

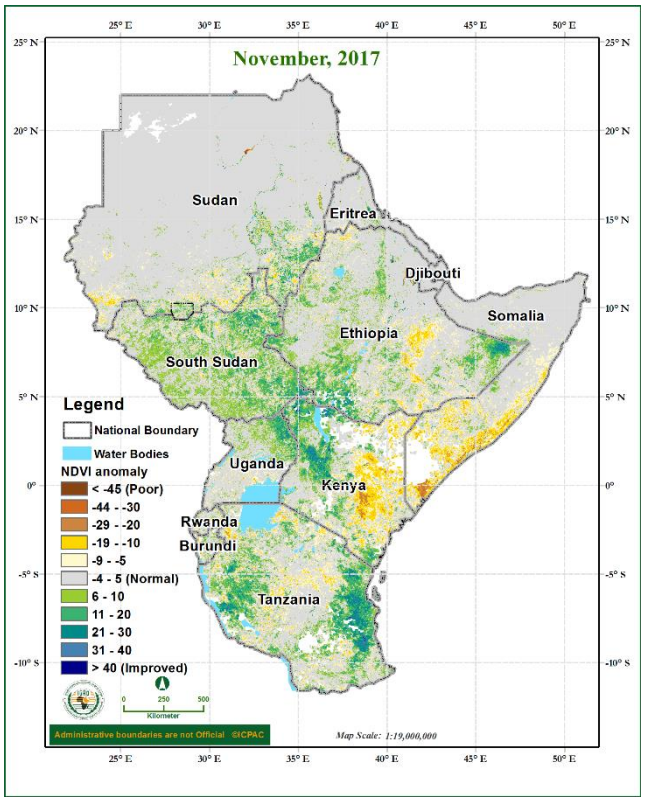

Figure 9: Normalized Difference Vegetation Index (NDVI) for November 2017 over the Greater Horn of Africa ***(Data Source: USGS-NASA*****)**

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the month of November 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), this situation presents a negative Southern Oscillation (ENSO) phase with weak La Niña (Figure 6) however models show an increased likelihood of persistence of La Niña condition during the end of 2017 to the first quarter of 2018. 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 7). There is a likely persistence of a positive IOD phase till way into the year 2018.

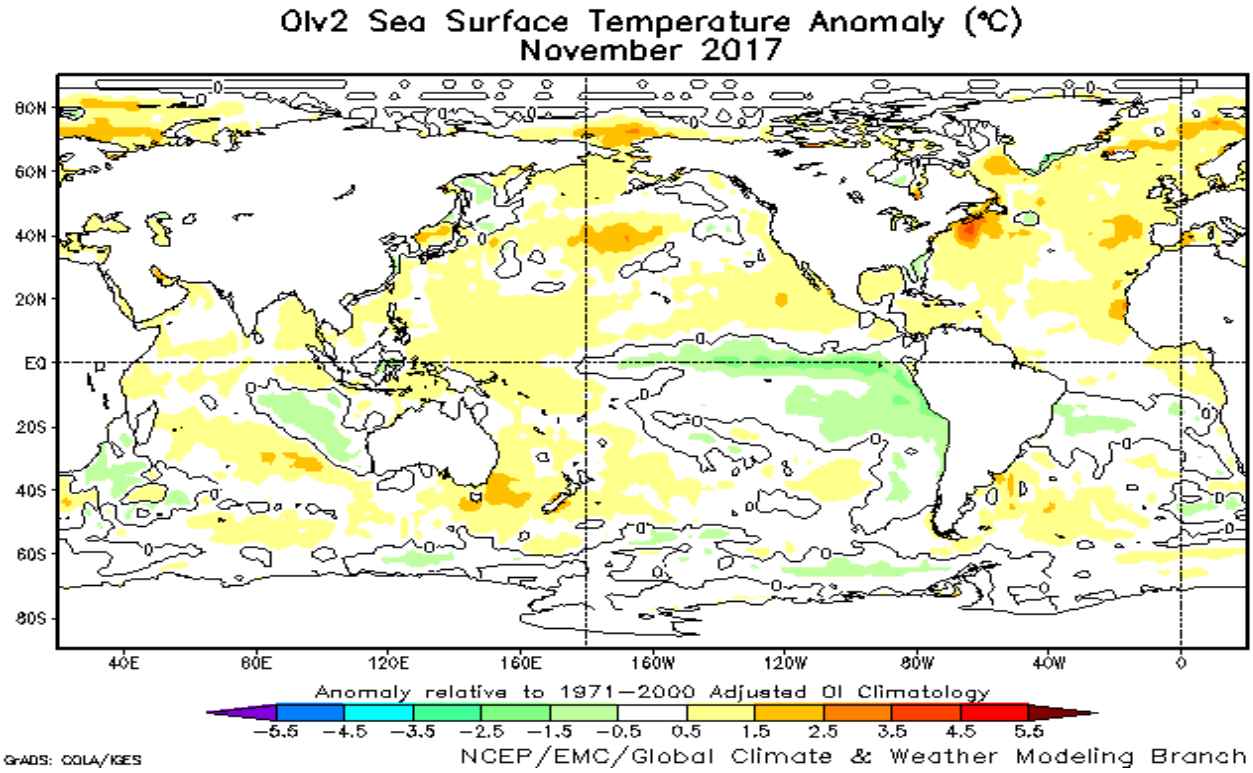

Figure 5: Sea Surface Temperature anomalies for November 2017 (*Source: NOAA/EMC/NCEP*)

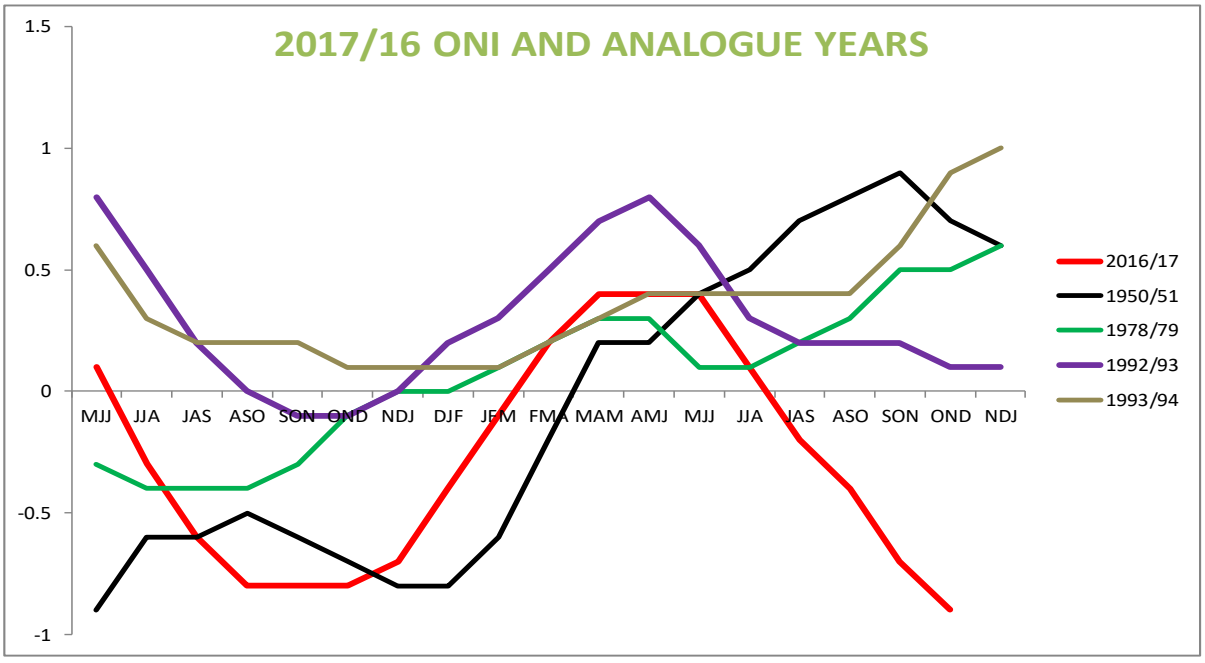

Figure 6: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

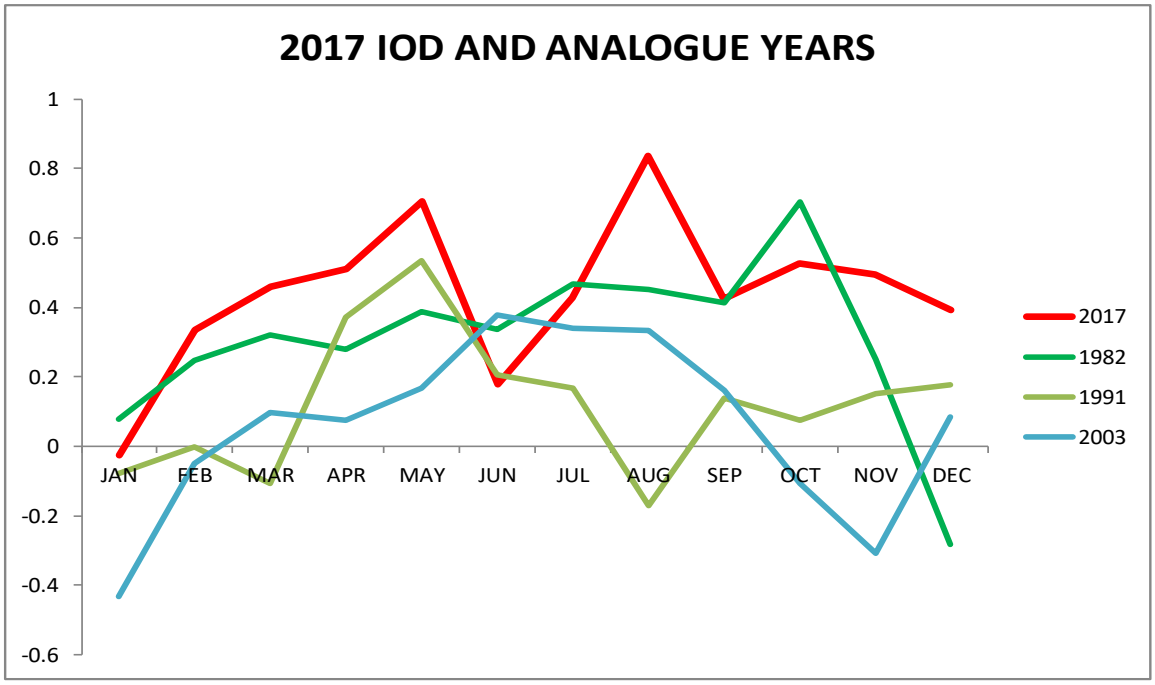

Figure 7: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR JANUARY 2018

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

The January 2018 rainfall forecast

During the month of January 2018, rainfall is likely to be concentrated in much of Tanzania and in parts of Rwanda, Burundi, and a few parts of coastal Kenya. With western central and southern parts of Tanzania recording high rainfall amounts (Figure 8a). Much of the rest of the GHA is likely to record less than 10 mm of rainfall or remain generally dry.

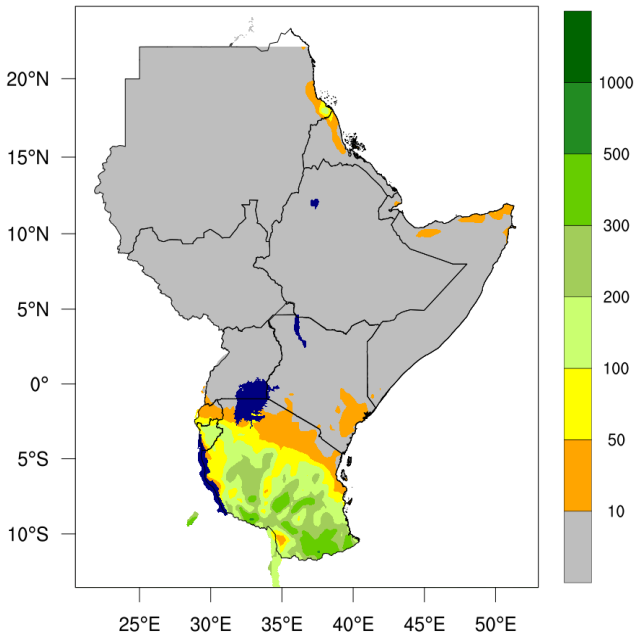

Figure 8a: Forecast of rainfall total for January 2018

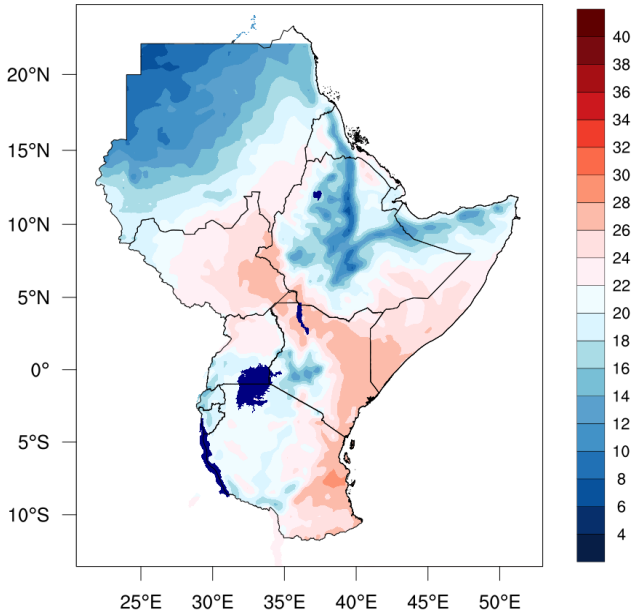

Figure 8b: Mean temperature forecast for January 2018.

The January 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over much of Sudan, central and southern Eritrea, Djibouti, northern Somalia, Ethiopia, southern Uganda, western and central parts of Kenya, Rwanda, Burundi, and northwestern and western 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 rainfall conditions and those from the January 2017 rainfall and temperature forecast are provided below.

Impacts of observed climate conditions during November 2017

During the month of November 2017, a few places in the GHA especially in some areas in the equatorial sector of the GHA reported cases of flooding which disrupted livelihoods and led to the destruction of infrastructure. Several areas especially in parts of the equatorial sector as well as parts of the southern sector of the GHA experienced good rainfall performance leading to improved pasture and water conditions. However a few areas in the northern sector of the GHA showed persistence in dry conditions leading to continued deterioration in water and pasture conditions. Water related diseases was reported in eastern parts of the equatorial sector, and in parts of southern sector.

Potential impacts for January 2018 climate outlook

In the month of January 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 southern sector, and southern parts of the equatorial sector of the GHA. Several areas especially in coastal, central and southern Tanzania are likely to experienced high rainfall which might lead to flooding and the associated impact. The dry conditions in the equatorial sector may lead persistence in water and pasture deterioration affecting crop and livestock productivity.

For more information contact

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

Tel: +254-020-3514426

E-mail: director@icpac.net