I C P A C

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

1. INTRODUCTION

This bulletin reviews the September 2017 climate condition over the Greater Horn of Africa (GHA) region and highlights the November 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 September 2017 are discussed, while the dominant weather systems are discussed in the section 4. In section 5, the November 2017 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from November 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 September was generally above to near the normal conditions in several parts of the GHA region, except in some places in the northern, western and southeastern parts of the northern sector, and in southeastern and southwestern parts of the equatorial sector of the GHA (Figure 1). Much of the equatorial sector, northern and southern parts of the southern sector and south-central and central parts of the northern sector recorded above to near normal precipitation during September 2017(Figure 2 and Figure 3).

Warmer than the average maximum temperatures conditions was experienced mainly over much western part of northern sector of GHA (Figure 4a). Warmer than the average minimum was experienced mainly in the northern and western part of the northern sector of the GHA (Figure 4b) while much of the rest of the GHA recording near average condition for maximum and minimum temperature during the month of 2017.

Improvement in water and pasture conditions resulting to prospects of good crop and planting season, and livestock productivity following the rainfall condition for the month of September. However a few places especially in the eastern part 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 resulting to poor prospect of crop and livestock

productivity, and general water stress as direct negative impacts of depressed rainfall conditions. A few places also reported flooding which interrupted livelihoods especially in some areas in Sudan and in the southwestern parts of the equatorial sector of the GHA.

In September 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 (Figure 7a) 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 (Figure 7b). The ONI is forecasted to persist in a neutral phase in the coming few months with an increasing chance of negative phase towards the end of the year 2017, while the IOD shows more likelihood of persisting in the positive phase towards the end of the year 2017.

November 2017 forecast indicates that, rainfall is likely to be to perform well in the equatorial and southern sector of the GHA region (Figure 8a).

3. CLIMATE PATTERNS IN SEPTEMBER 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 September 2017 are provided in this section. The minimum and maximum temperature anomalies (2008-2016) are also given.

Rainfall amounts in September 2017

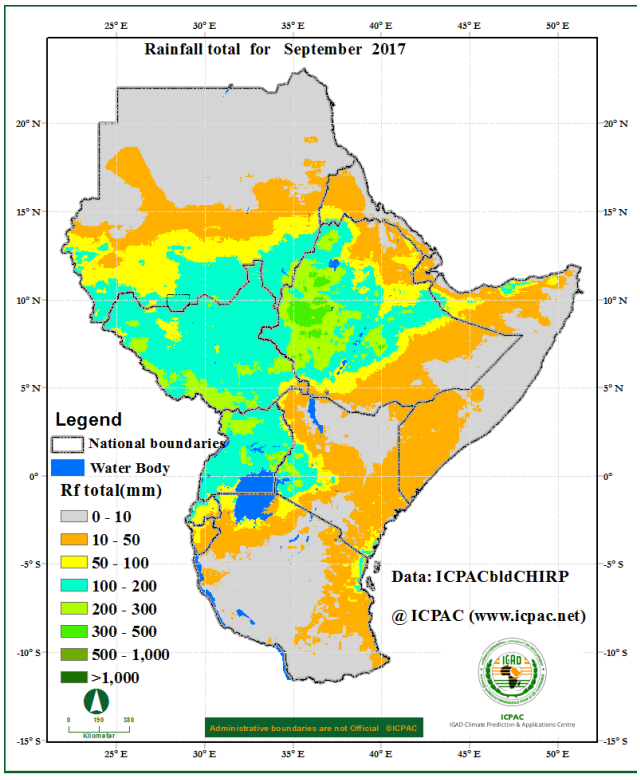

Figure 1: Spatial distribution of rainfall during the month of September 2017*(Data Source : CHIRPS)*

During the month of September 2017, areas covering much of northern parts of Sudan, coastal and central Eritrea, eastern Djibouti, southeast Ethiopia, central and northeast of Somalia, northern and south-central Kenya, and over much of Tanzania recorded less than 10mm of rainfall. Rainfall exceeding 100mm was recorded in southern parts of Sudan, over much of South Sudan, Uganda, western, eastern and central Ethiopia, western Kenya, and in northern Rwanda. The western parts of Ethiopia, western and South Sudan, in parts of northwestern and southeastern Uganda, and in parts of western Kenya rainfall of exceeding 200mm was recorded. The highest range of rainfall of between 300mm and 500mm was recorded in western Ethiopia. The rest of the GHA recorded between 10mm and 100mm of rainfall. (Figure 1).

Rainfall severity in the month of September 2017

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

In September 2017, rainfall greater than less than 75% of the long term average was recorded in a few areas in eastern and southwestern parts of Sudan, northwester South Sudan, western Eritrea; in northwestern and southeastern parts of Ethiopia extending to much of central Somalia; and in a few areas in southwest Uganda, southwest of Rwanda, eastern Kenya, and in western part of Tanzania. Much of the rest of the GHA region recorded rainfall of exceeding 75% of the of the long term average for the month of September.

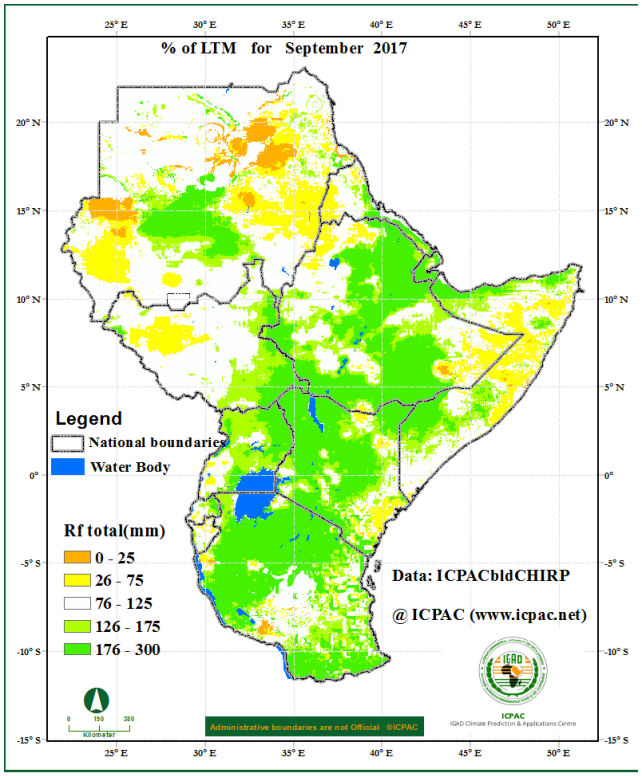

Figure 2: Percentage of average rainfall for September 2017 *(Data Source: CHIRPS)*

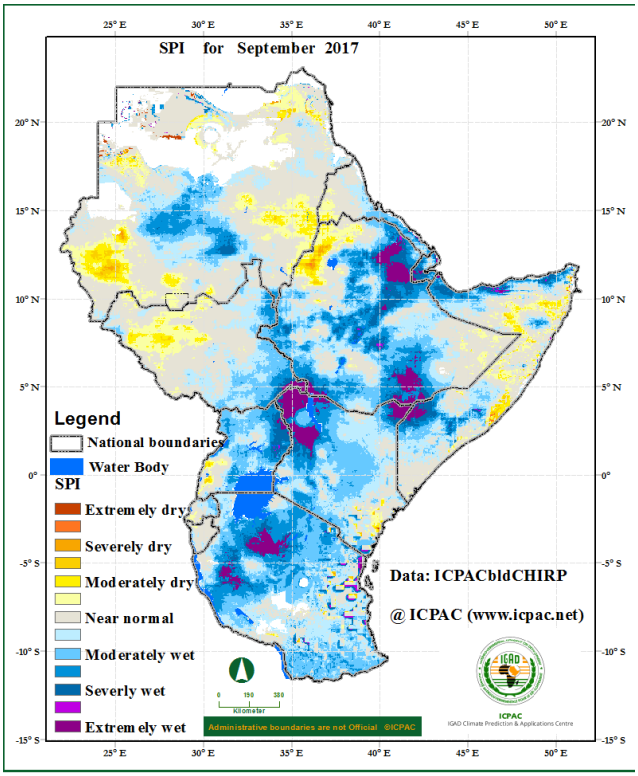

Figure 3: Standardized Precipitation Index for September 2017 *(Data Source: CHIRPS)*

A few areas in southwest and southeast of Sudan, northwest of South Sudan, northwestern and southeastern Ethiopia,; I parts of north and central southern Somalia; and in southwest Uganda, and coastal Kenya moderately dry to severely dry rainfall conditions was observed. The rest of the GHA region recorded near normal to extremely wet rainfall conditions, with much of the equatorial sector, southern sector and south-central and central parts of the northern sector recording moderately wet to extremely wet rainfall conditions.

Temperature Conditions

During September 2017, warmer than the average maximum temperatures conditions was experienced mainly over much of southern part of Sudan, southwestern Eritrea and South Sudan; and in a few areas in central Kenya, and central parts of Tanzania. Much of the rest of the GHA recorded maximum temperature near average conditions (Figure 4a).

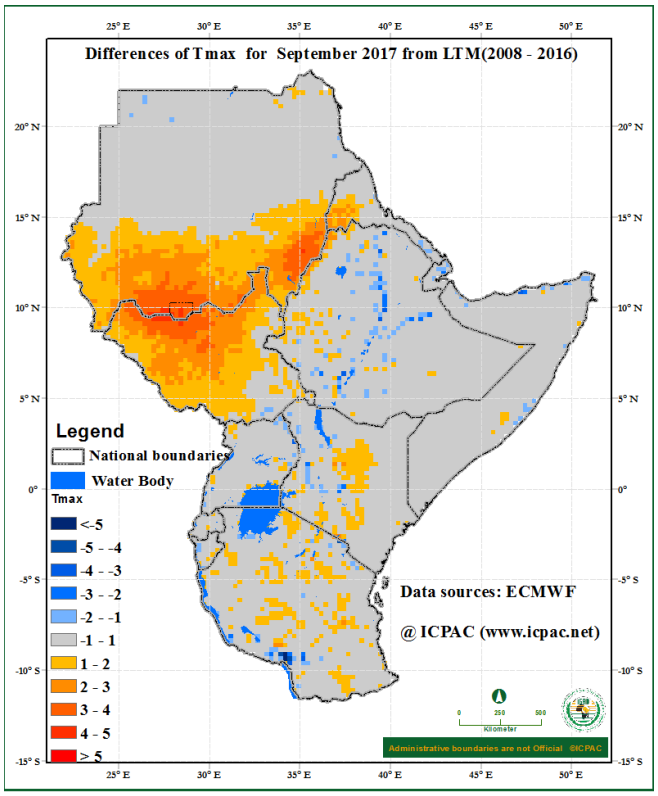

Figure 4a: Maximum temperature anomalies for September 2017 *f*rom LTM, 2008-2016 (*Data Source: ECMWF)***

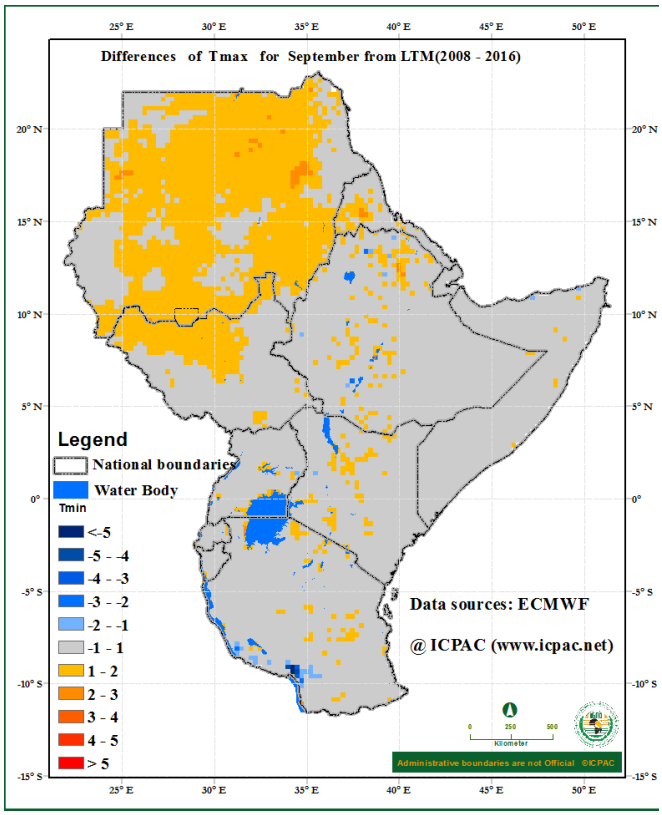

Figure 4b: Minimum temperature anomalies for September 2017 from LTM, 2008-2016 *(Data Source: ECMWF)*

Several parts of Sudan, and in northern part of South Sudan; as well as a few dispersed areas in southwest Eritrea, northern and central Ethiopia, central Kenya and central Tanzania recorded above the average minimum temperature conditions in the month of September 2017. The rest of the GHA recorded near the average conditions for the minimum temperature (Figure 4b).

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the period 20 September – 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 6) 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 7).

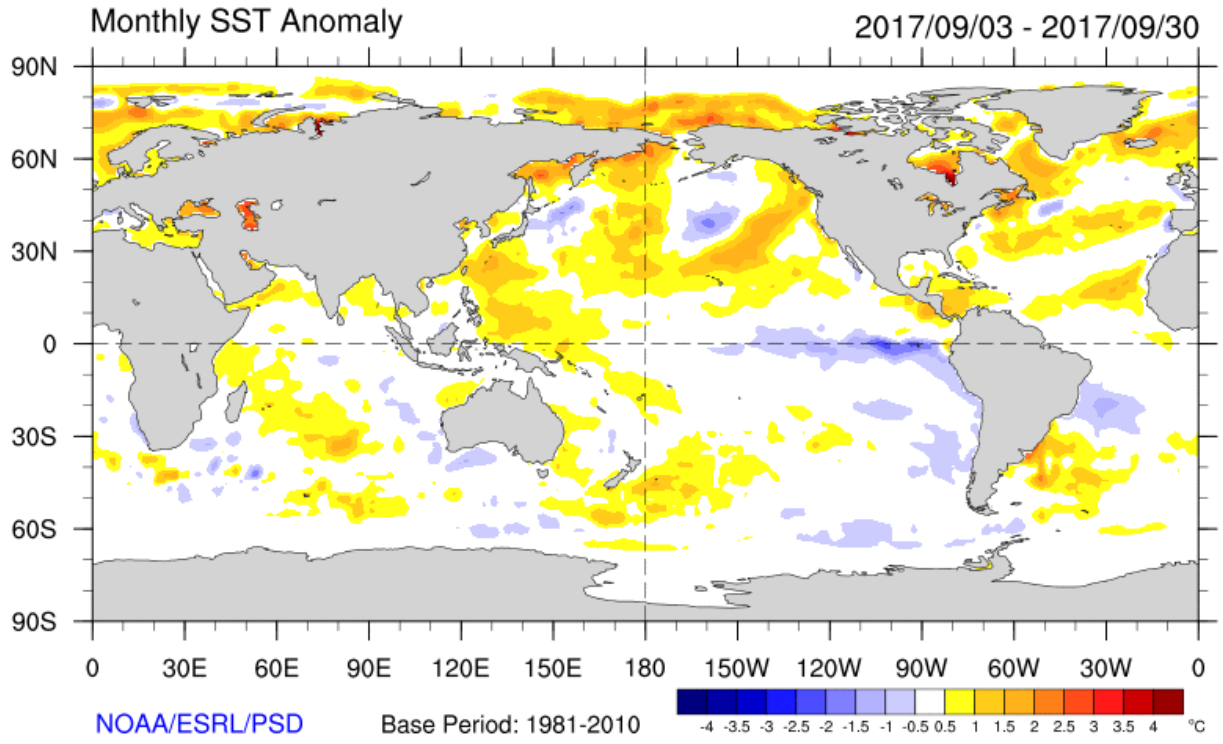

Figure 5: Sea Surface Temperature anomalies for the period 03 September to 30 September 2017 (*Source: NOAA/ESRL/PSD*)

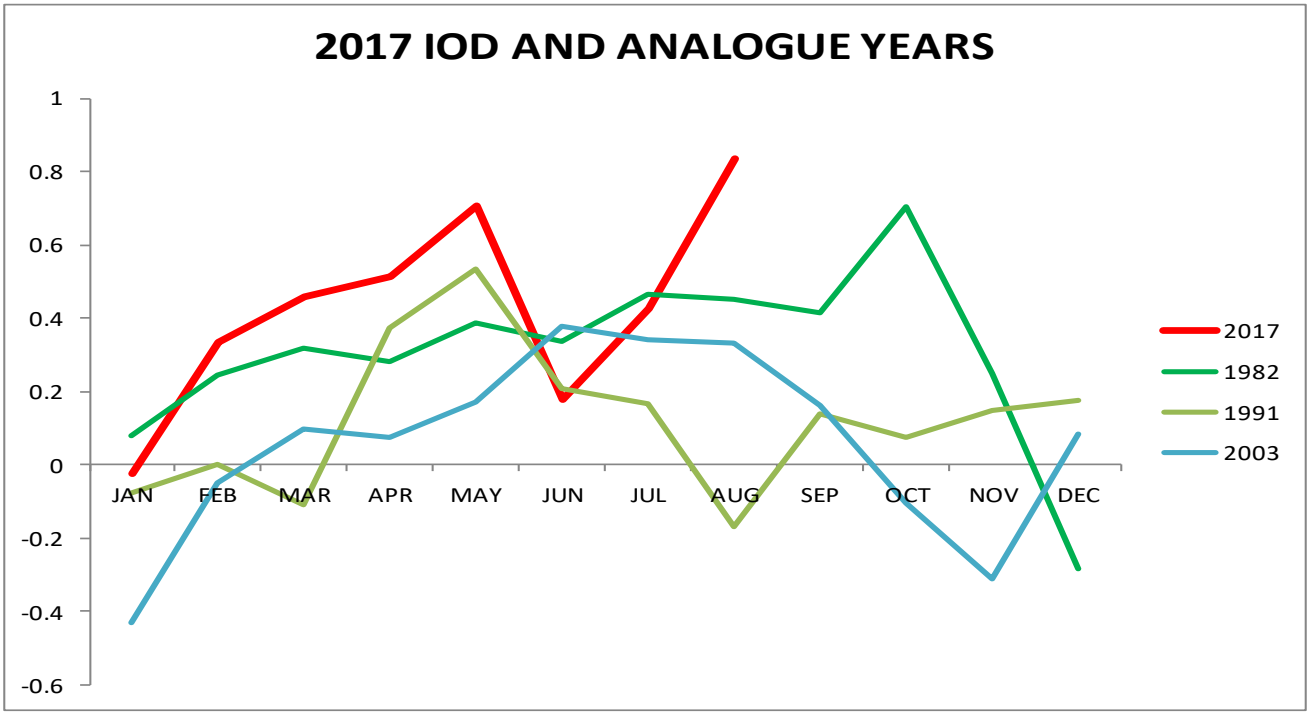

Figure 6: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

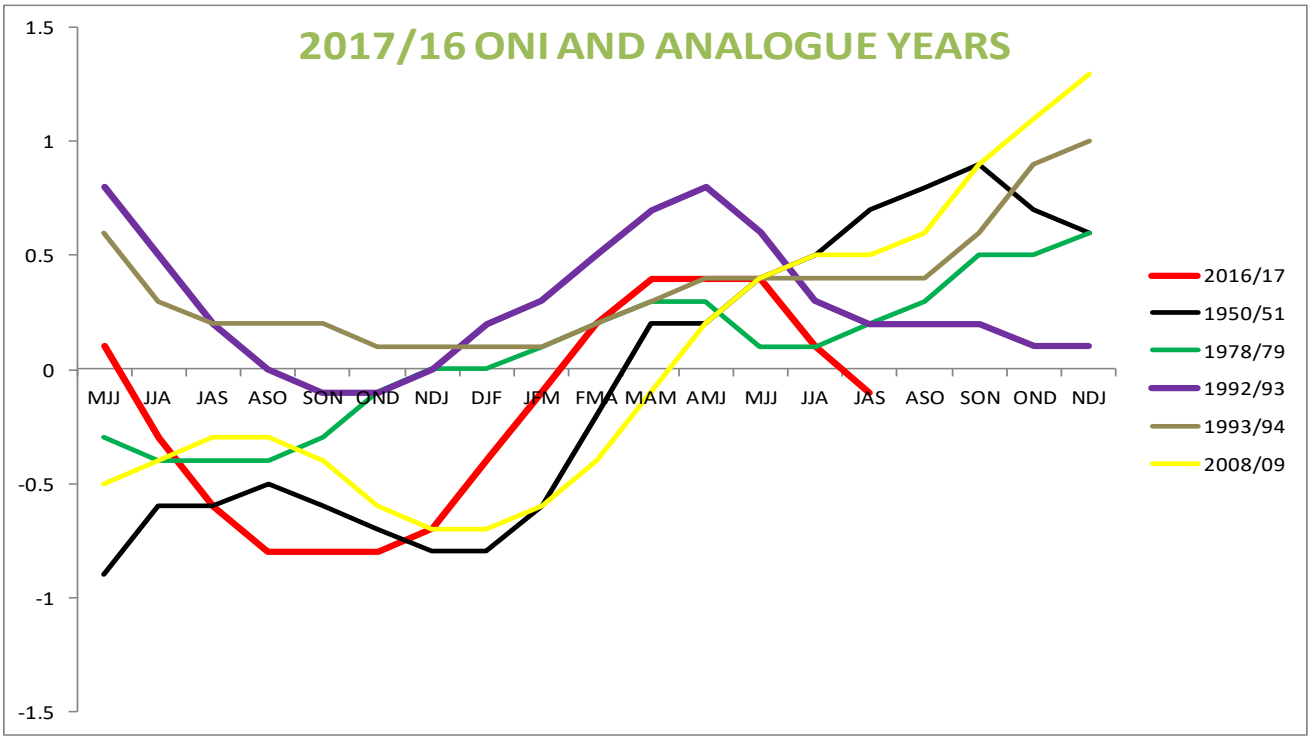

Figure 7: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR NOVEMBER 2017

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

The November 2017 rainfall forecast

In the month of November 2017, much of the southern part of the northern sector, equatorial sector and southern sector of the GHA is likely to experience rainfall. Rainfall amount greater than 300mm is likely to be experienced in, southern parts of South Sudan, southern Ethiopia, northern and southern Somalia; over much of Uganda, Kenya, Rwanda, Burundi and Tanzania. Areas around central and southeastern Uganda, northeastern and southern Somalia; in much of the southern parts of Kenya, Rwanda, Burundi, and northern Tanzania are likely to record more than 500mm of rainfall. The highest range rainfall expected will exceed 1000mm which is likely to be experienced in northern Somalia, in parts of central and western Kenya; in parts of Rwanda and Burundi; and in northwestern and northern Tanzania (Figure 8a). Much of the areas covering central Eritrea, central South Sudan, much of Ethiopia, central Somalia and southern Sudan recording between 10mm and 100mm. Much of Sudan, western and southern Eritrea, northern South Sudan, eastern Djibouti, northern Ethiopia, parts of central Somalia is likely to record less than 10 mm of rainfall

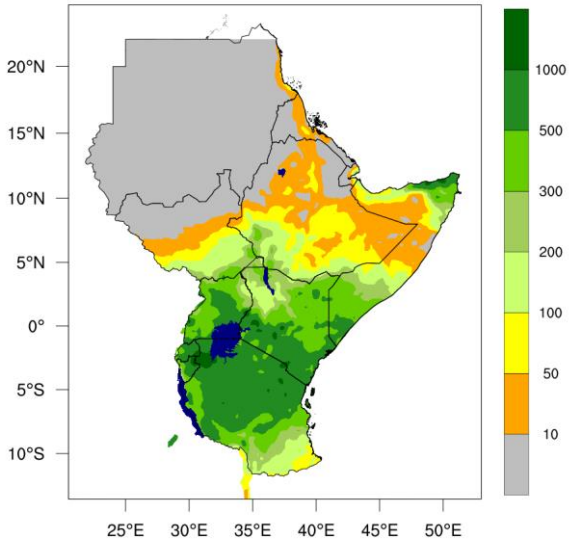

Figure 8a: Forecast of rainfall total for November 2017

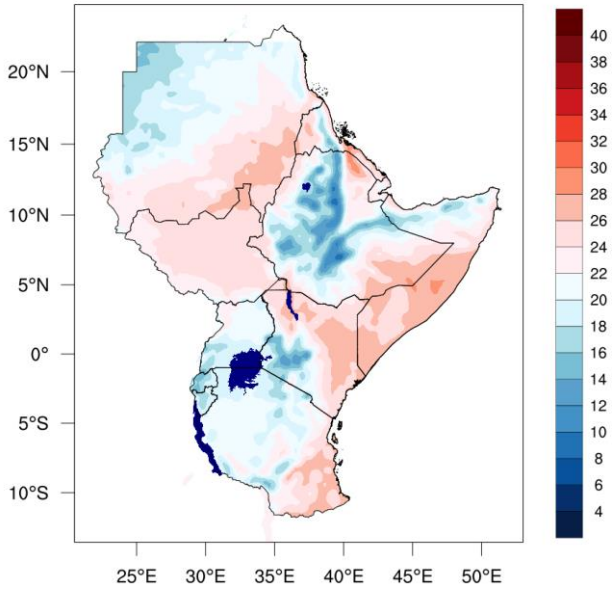

Figure 8b: Mean temperature forecast for November 2017.

The November 2017 Temperature forecast

Average temperature of more than 22°C is likely to be observed in much of the GHA region except for areas in northern Sudan, central Eritrea, north, west, and central highlands of Ethiopia, northern Somalia, western and central Kenya; over much of Uganda, Rwanda, Burundi, and in north and western Tanzania. The warmest temperatures exceeding 30 °C is likely to be experienced in the southwestern part of Sudan, western and central parts of Eritrea, and in central part of Somalia (Figure 8b).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

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

Vegetation Condition Indicators and Associated Impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for September 2017 indicated that 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, southeastern Somalia, in northern parts of Tanzania, and in parts of 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 southern parts of Sudan, in eastern parts of South Sudan, northeastern and central parts of Ethiopia, in northern and northeastern Uganda, western Kenya, and in southern and eastern Tanzania. (Figure 9).

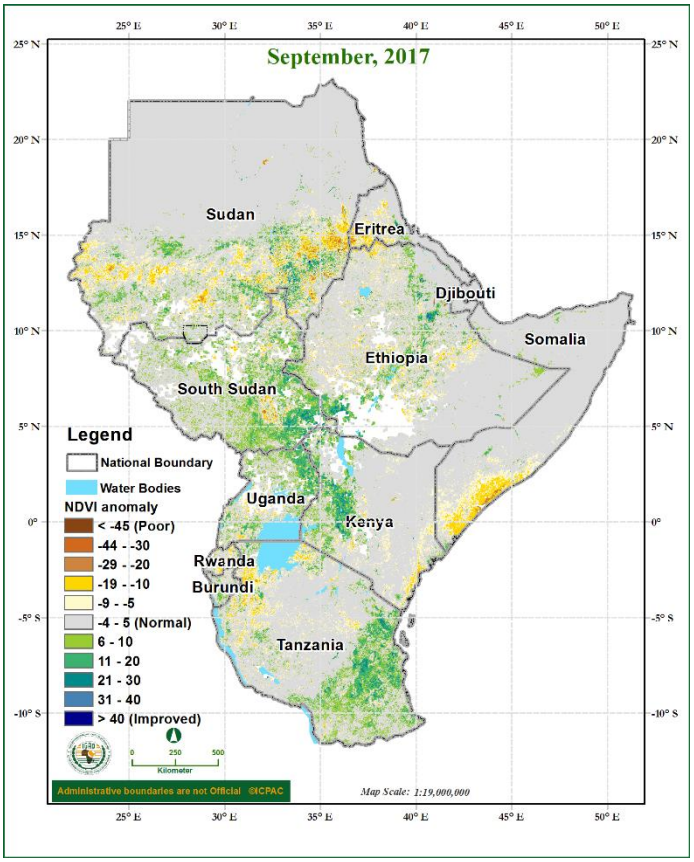

Figure 9: Normalized Difference Vegetation Index (NDVI) for September 2017 over the Greater Horn of Africa *(Data Source: USGS-NASA)*

Impacts of observed climate conditions during September 2017

During the month of September 2017, a few places in the GHA especially in some areas in Sudan, there is reported cases of high temperature related heat stress. Some areas in the northern sector and southwestern equatorial sector of the GHA has reported cases of flooding which disrupted livelihoods. Several areas especially in the southern parts of the northern sector and western and parts of the equatorial sector experienced good rainfall performance leading to improved pasture and water conditions during September 2017. However a few areas in the central and eastern equatorial sector, as well as southeastern parts of the northern sector of the GHA showed persistence in dry conditions leading to continued deterioration in water, crop and pasture conditions.

Potential impacts for November 2017 climate outlook

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

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