I C P A C

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

1. INTRODUCTION

This bulletin reviews the October 2017 climate condition over the Greater Horn of Africa (GHA) region and highlights the December 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 October 2017, while the dominant weather systems are discussed in section 4. In section 5, the December 2017 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from December 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 October 2017 shows that parts of central to southeast of the northern sector, central and southwestern parts of the equatorial sector, as well as northwest and eastern parts of the southern sector of the GHA experienced above normal rainfall conditions. However much of the western, and southeastern parts of the northern sector, as well as western and eastern parts of the equatorial sector of the GHA (Figure 1) experienced below average rainfall conditions, while the rest of the GHA experienced near normal rainfall conditions during October 2017(Figure 2 and Figure 3).

Warmer than the average maximum temperatures conditions was experienced mainly over southwestern and southeastern parts of northern sector, as well as western and eastern parts of the equatorials sector of GHA during the month of October 2017 (Figure 4a). Areas covering north of Sudan as well as parts of western Ethiopia indicated cooler than average condition for maximum temperature. Warmer than the average minimum was experienced mainly in southern part of the northern 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 commencement of planting season, and livestock productivity following the rainfall condition for the month of October. However a few places especially in the eastern part of the equatorial sector as well as northern and

south-eastern parts of the northern sector experience impacts of depressed rainfall conditions that has led to deterioration of water of resources, 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 October 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), although edging closer to La Niña conditions**.** Indian Ocean Dipole (IOD), which is the signal of interaction between the ocean and the atmosphere in the Indian Ocean, showed a slight positive phase (Figure 7b). IOD is forecasted to persist in the neutral phase in the coming few months.

In the month of December 2017, rainfall is expected to be concentrated over much of southern sector and southern parts of the equatorial sector of the GHA. A few areas in the northern parts of the equatorial sector and southeastern part of the northern sector of the GHA are also likely to record some rainfall (Figure 8a) activities.

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

Rainfall amounts in October 2017

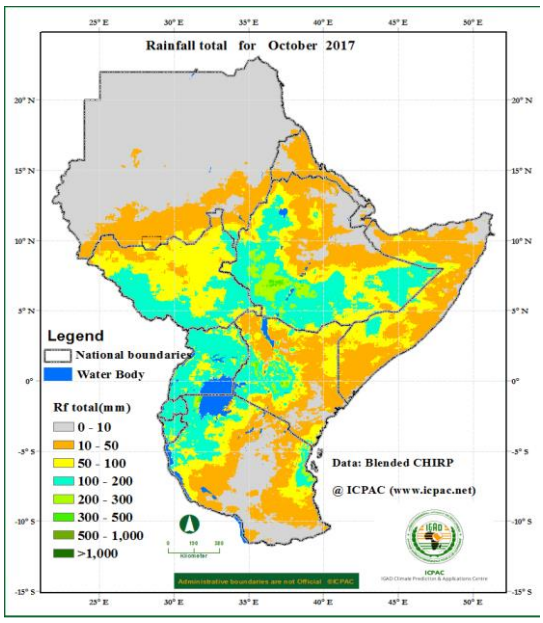

Figure 1: Spatial distribution of rainfall during the month of October 2017*(Data Source : CHIRPS)*

During the month of October 2017, areas covering much of Sudan, western and southern Eritrea, Djibouti, northeastern Ethiopia, northern parts of Somalia, southeastern parts of Kenya, and over much of central and southern parts of Tanzania recorded less than 10mm of rainfall. Rainfall exceeding 300mm being the highest range of recorded rainfall for the month of October 2017, was recorded in southern parts of Ethiopia. Overmuch of southwestern and southern South Sudan, western and southern parts of Ethiopia; over much of Uganda, Rwanda and Burundi; and in western and central parts of Kenya as well as northwestern and northern coat of Tanzania rainfall amount of between 100mm to 200mm was recorded. The rest of the GHA recorded between 10mm and 100mm of rainfall. (Figure 1).

Rainfall severity in the month of October 2017

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

In October 2017, rainfall less than 75% of the long term average was recorded in a southern and eastern parts f Sudan, in north and western parts of South Sudan, western Eritrea; western and southern parts of Uganda; in northeastern parts of Ethiopia; over much of Somalia, in eastern an coastal parts of Kenya; and in central and northeastern Tanzania. Much of central and southern Eritrea, Djibouti, northern and southern Ethiopia; in parts of central Sudan, southeastern South Sudan, eastern Uganda, and in parts of north, west and central Kenya, eastern Rwanda, eastern Burundi; and in much of Tanzania rainfall of exceeding 125% of the of the long term average for the month of October was recorded. The rest of the GHA recorded rainfall of between 75 and 125% of the long term average. A few areas in southeastern and central Ethiopia, northern and southwestern parts of Somalia, eastern and southeastern Kenya, and northeastern Tanzania showed indication of improvement in rainfall performance as compared with the long term average

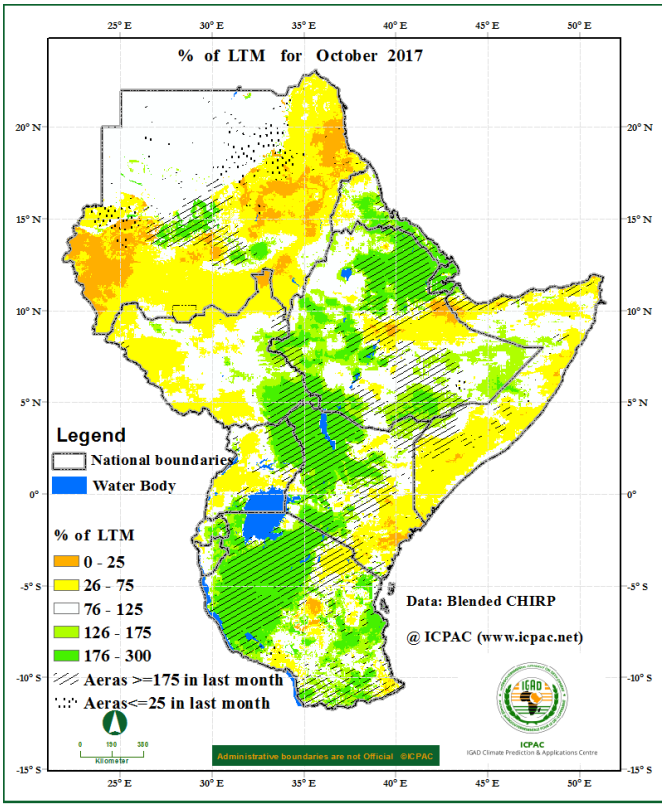

Figure 2: Percentage of average rainfall for October 2017 *(Data Source: CHIRPS)*

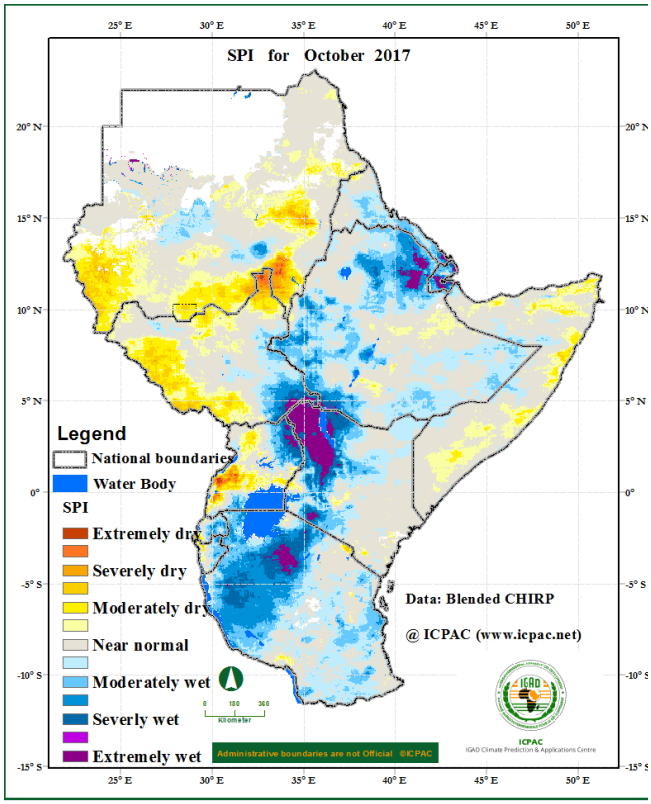

Figure 3: Standardized Precipitation Index for October 2017 *(Data Source: CHIRPS)*

Much of the GHA recorded near normal to extremely wet rainfall conditions, with areas in northeastern Ethiopia, southern Djibouti, around northwestern and western Kenya and in parts of northern Tanzania recording between severely wet to extremely wet rainfall conditions. Some areas in southern parts of

Sudan, western and northern parts of South Sudan, western and southern Uganda, and in a few areas in Somalia moderately dry to severely rainfall conditions was experienced during the month of October 2017.

Temperature Conditions

During October 2017, warmer than the average maximum temperatures conditions was experienced mainly over much of southern part of Sudan, South Sudan, and southwestern Eritrea; in much eastern Ethiopia extending t much of Somalia and eastern Kenya; in much of Uganda except for the northeastern and southwestern parts; and in parts of Rwanda, Burundi, and eastern and southern Tanzania. Cooler than the average for maximum temperature was recorded in the northern parts of Sudan while much of the rest of the GA recorded near the average for maximum temperatures (Figure 4a).

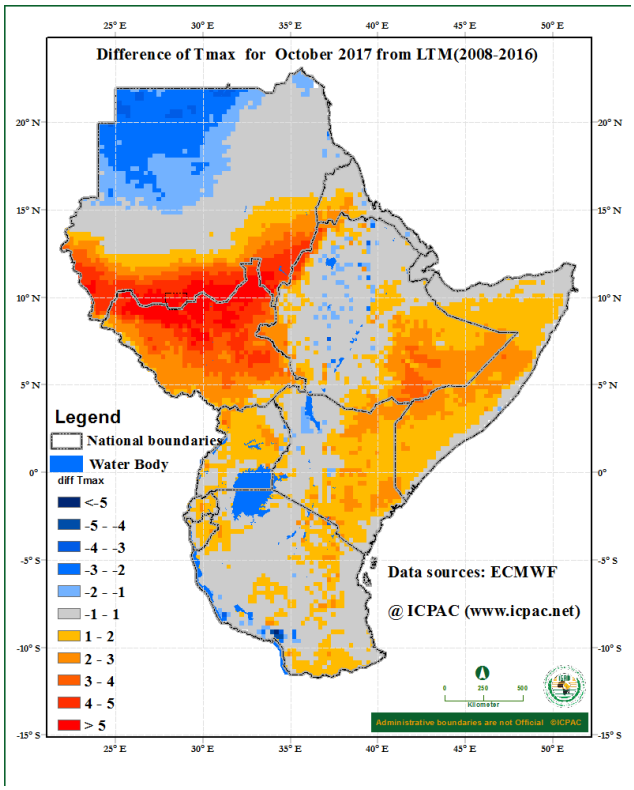

Figure 4a: Maximum temperature anomalies for October 2017 *f*rom LTM, 2008-2016 (*Data Source: ECMWF)***

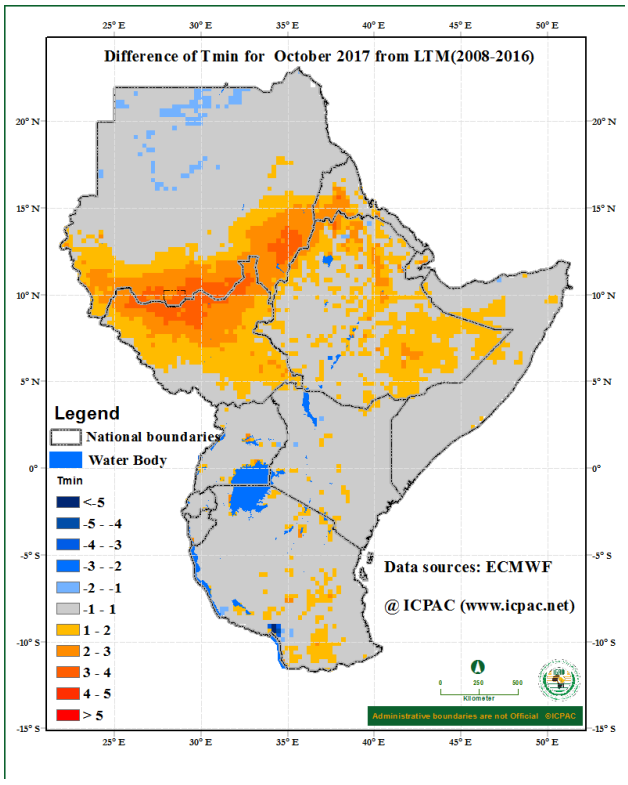

Figure 4b: Minimum temperature anomalies for October 2017 from LTM, 2008-2016 *(Data Source: ECMWF)*

Warmer than the average conditions for minimum temperatures was recorded mainly in much of the southern parts of Sudan, in southwest Eritrea, northern and eastern Ethiopia; in much of South Sudan except for the southern parts; and in a few areas in central and western Kenya, and eastern and southern Tanzania in the month of October 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 01 October – October 28, 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 neutral El Niño Southern Oscillation (ENSO) phase (Figure 6) with models forecasting 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 slight positive phase of the IOD (Figure 7).

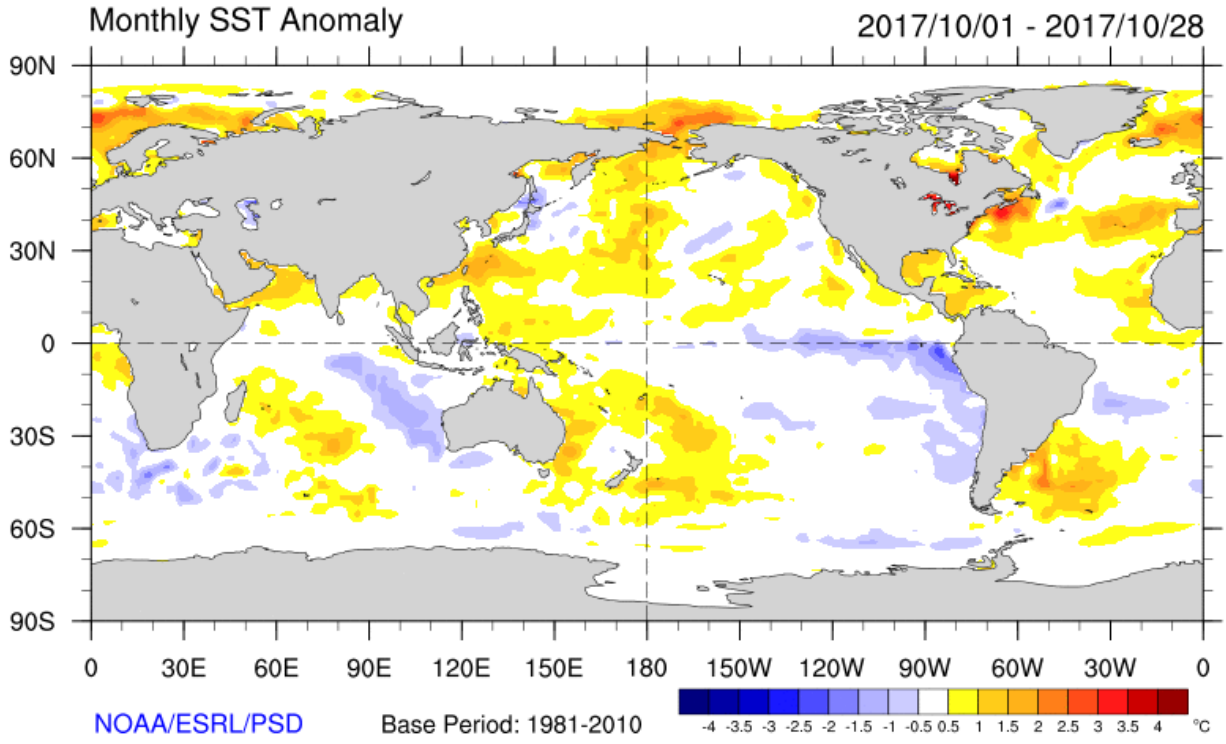

Figure 5: Sea Surface Temperature anomalies for the period 03 October to 30 October 2017 (*Source: NOAA/ESRL/PSD*)

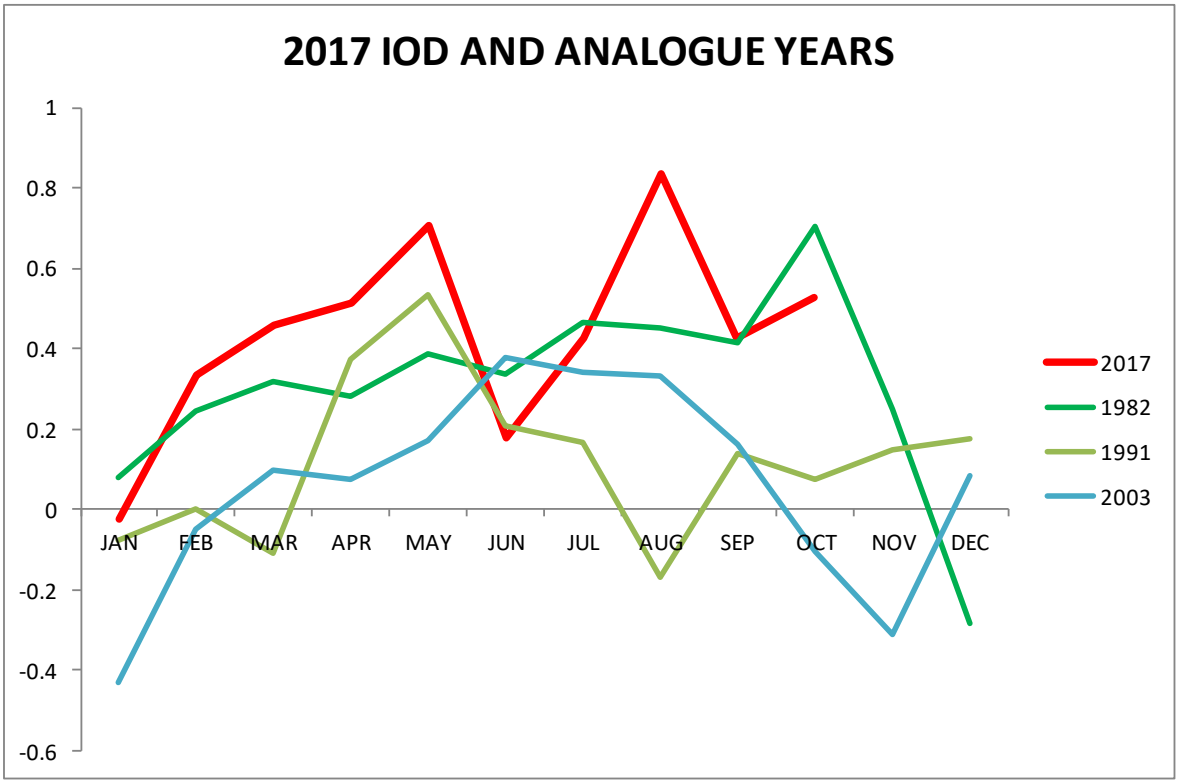

Figure 6: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

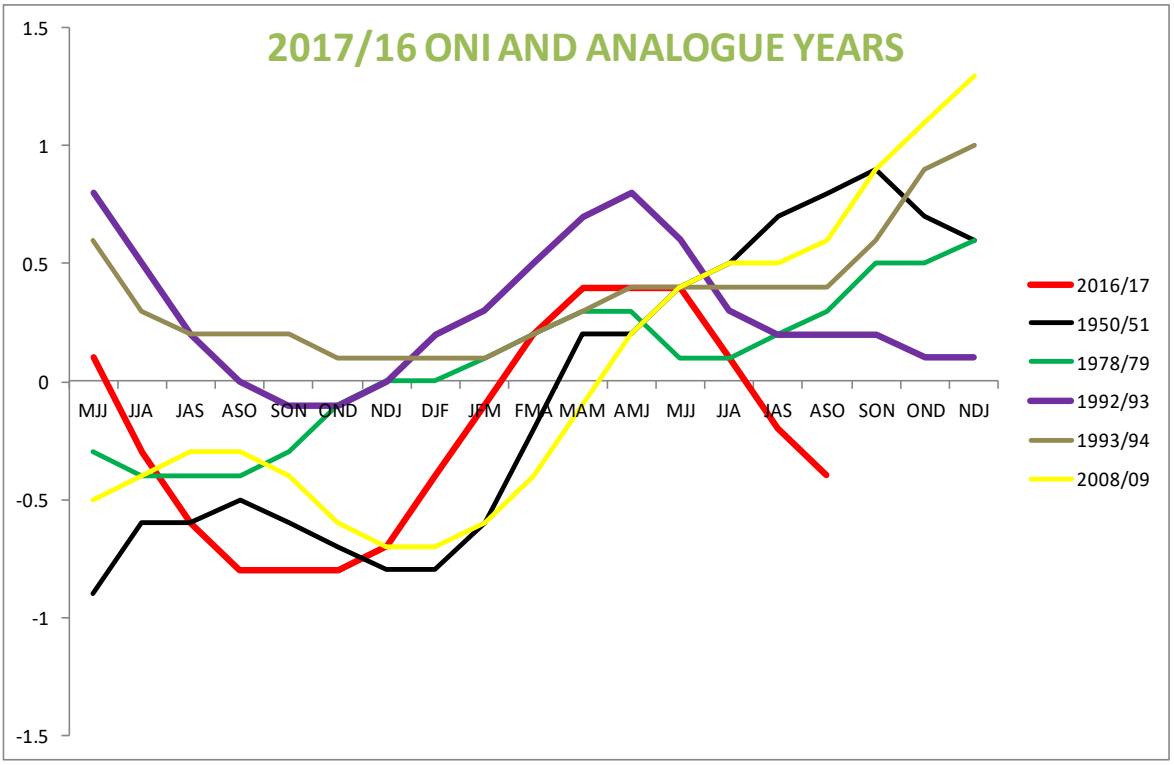

Figure 7: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR DECEMBER 2017

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

The December 2017 rainfall forecast

during the month of December 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

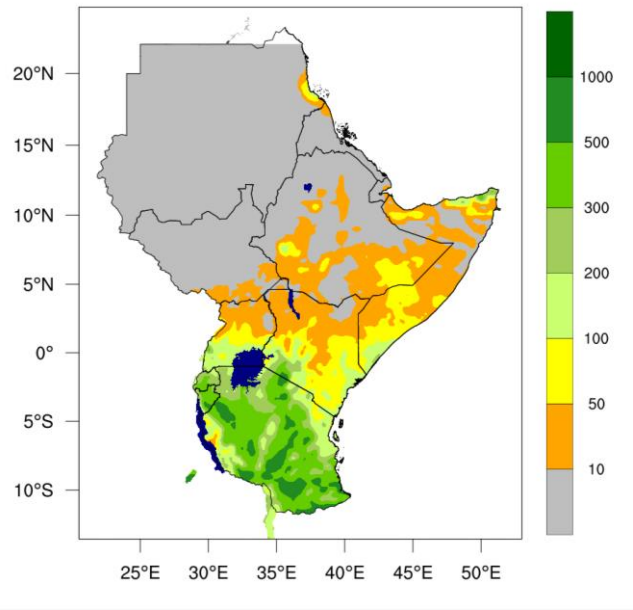

Figure 8a: Forecast of rainfall total for December 2017

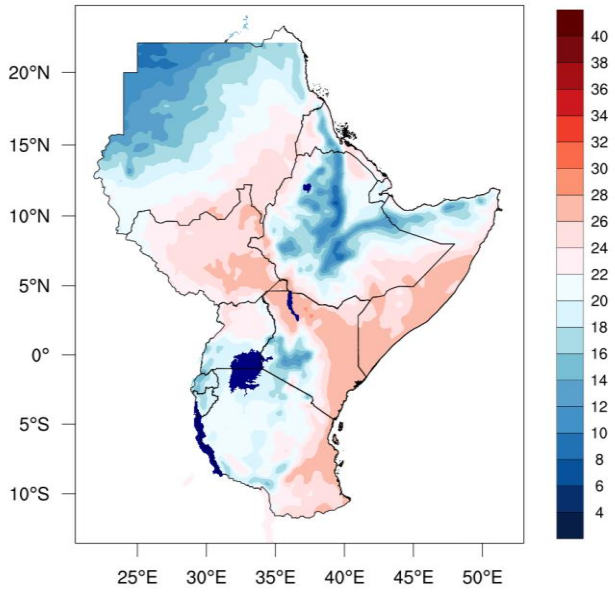

Figure 8b: Mean temperature forecast for December 2017.

The December 2017 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over much of Sudan, western Eritrea, Djibouti, northern Somalia, Ethiopia, southern Uganda, western and central parts of Kenya, Rwanda,

Burundi, and northern 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 December 2017 rainfall and temperature forecast are provided below.

Vegetation Condition Indicators and Associated Impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for October 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 covering southern parts of Sudan, southeastern Ethiopia, southern Somalia, southwestern Uganda, northwestern parts of Tanzania, and in parts of coastal and eastern 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 southeastern parts of Sudan, in several parts of South Sudan, northeastern and central parts of Ethiopia, in northern and eastern Uganda, western and central parts of Kenya, and in western and eastern parts of Tanzania. (Figure 9).

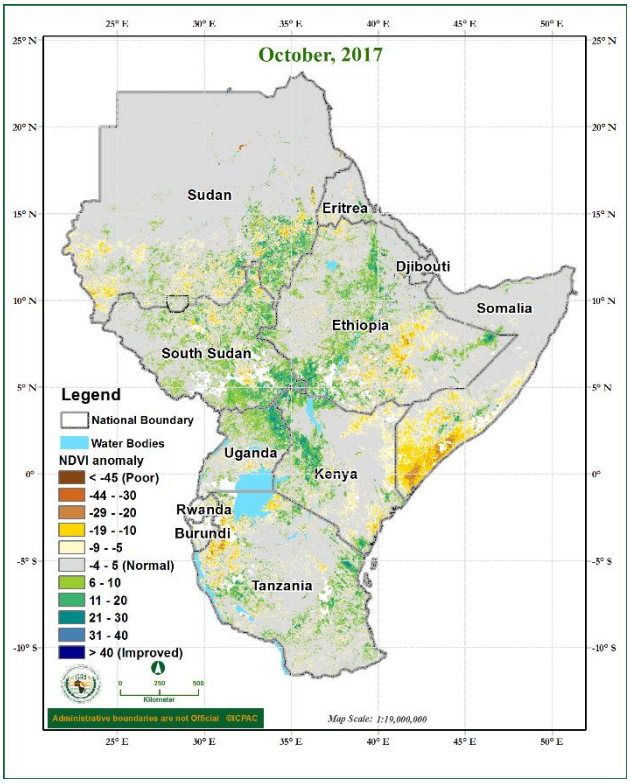

Figure 9: Normalized Difference Vegetation Index (NDVI) for October 2017 over the Greater Horn of Africa *(Data Source: USGS-NASA)*

Impacts of observed climate conditions during October 2017

During the month of October 2017, a few places in the GHA especially in some areas in the northern sector and southwestern and eastern equatorial sector of the GHA reported cases of flooding which disrupted livelihoods. 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 October 2017. 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.

Potential impacts for December 2017 climate outlook

In the month of December 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 southern sector, and southern parts of the equatorial sector of the GHA. Several areas in Tanzania, and in parts of Burundi, and southwestern Kenya are likely to experienced high rainfall which might lead to flooding and the associated impact.

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