IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for September and Forecasts for November 2018

1. INTRODUCTION

This bulletin reviews the September 2018 climate conditions over the Greater Horn of Africa (GHA) region and highlights the November 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 discusses the climate patterns that prevailed in the month of September 2018, while the dominant weather systems are discussed in section 4. In section 5, the November 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from November 2018 climate forecasts are outlined in section 6.

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

2. HIGHLIGHTS

Rainfall was concentrated mainly in the northern sector, and over western parts of the equatorial sector of the GHA. Some areas in southwest to central part of the northern sector as well as western part of the equatorial sector of the GHA experienced below normal rainfall. Much of the rest of the east of northern sector and equatorial sector of the GHA experienced near normal or above normal rainfall during the month of September 2018 (Figure 2 and 3).

The area covering southern part of Sudan and extending to northern part of South Sudan and western Eritrea recorded average maximum temperature that was cooler than the long-term mean (Figure 4a). A few places in western part of the northern sector and western part of the southern sector recorded minimum temperature cooler than the long-term mean. Much of the rest of the GHA recorded minimum and maximum temperature warmer than or near the long-term average for the month of September 2018.

The general rainfall condition in the northern sector as well as western equatorial sector of GHA resulted in continued good water and pasture conditions resulting to prospects for good crop, and livestock productivity for the month of September 2018.

By September 2018, the Oceanic Nino Index (ONI), one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO) showed a neutral signal (Figure 7a) and Indian Ocean Dipole (IOD) indicated a positive IOD but still in a neutral phase (Figure 7b).The ONI and IOD are forecasted to transition into a positive phases in the coming few months of towards the end of 2018.

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

3. CLIMATE PATTERNS IN SEPTEMBER 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 September 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

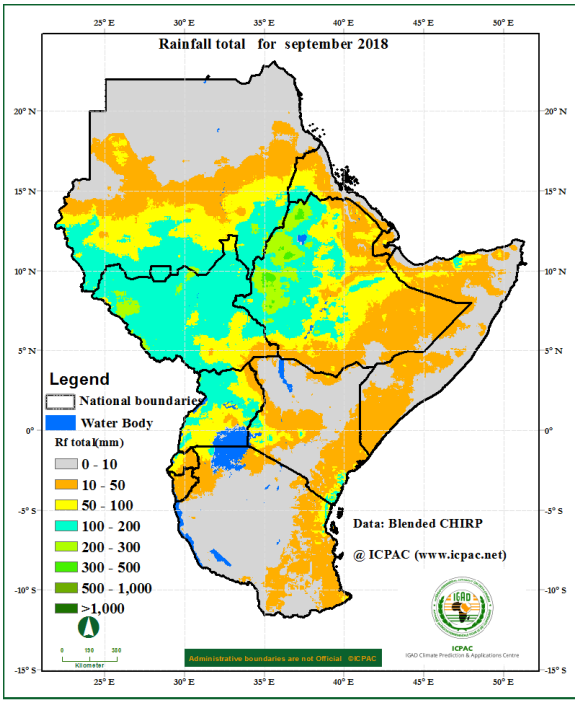

Figure 1: Spatial distribution of rainfall during the month of September 2018*(Data Source : Blended CHIRPS)*

Sudan and Ethiopia: Southern part of Sudan, and western and central Ethiopia recorded rainfall of between 50mm to 200mm. Some places in Western Ethiopia recorded rainfall of between 200mm and 500mm. Southern part of Sudan, western, central and eastern part of Ethiopia recorded below normal to near normal rainfall conditions, with much of the rest of these areas recording above normal or near normal rainfall conditions.

South Sudan, and Uganda: Most of these areas recorded between 100mm and 200mm of rainfall except for southeast South Sudan, and northeast and southern part of Uganda. The rainfall was mainly near normal or below normal over most of these areas except for northeastern part of Uganda, which recorded above normal rainfall.

Eritrea and Djibouti: Western Eritrea and much of Djibouti recorded rainfall of between 10mm and 100mm. Most of these areas recorded above normal rainfall.

Rwanda, Burundi, Kenya and Somalia: western Rwanda, and western and southern coast of Kenya recorded rainfall of between 50mm and 200mm. Much of Burundi, eastern Rwanda, central and southeastern Kenya, southern and northwest Somalia recorded between 10mm and 50mm of rainfall. Rwanda, Burundi, and western and central parts of Kenya experienced below normal rainfall, while much of the rest of these areas experienced near normal rainfall.

Much of the rest of the GHA recorded less than 10mm of rainfall that resulted to generally dry or below normal rainfall conditions.

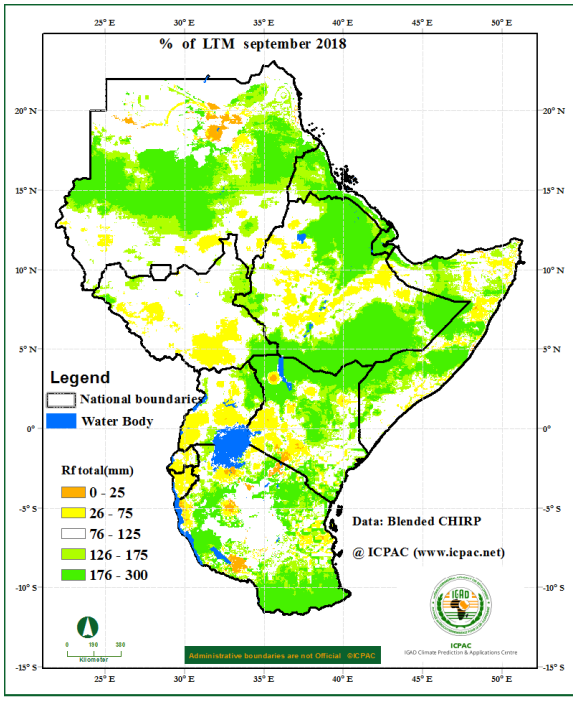

Figure 2: Percentage of average rainfall for September 2018*(Data Source: Blended CHIRPS)*

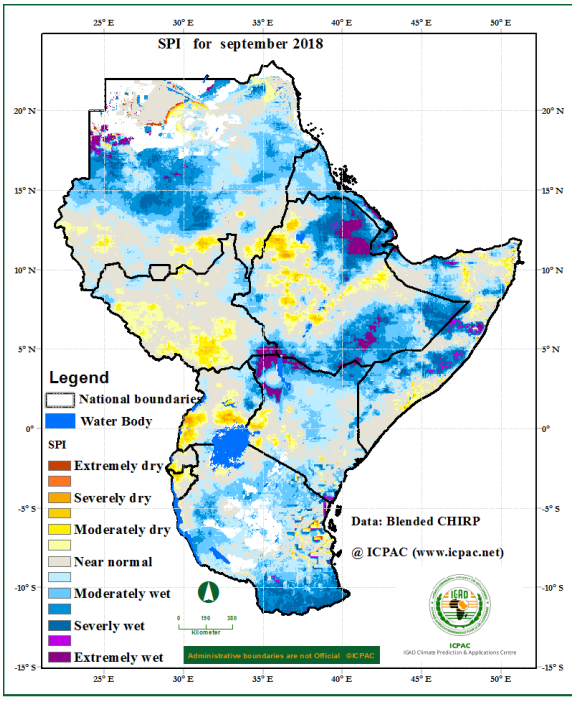

Figure 3: Standardized Precipitation Index for September 2018*(Data Source: Blended CHIRPS)*

Temperature Conditions

Sudan, Eritrea and South Sudan: much of Sudan, northern South Sudan, and western Eritrea recorded maximum temperatures cooler than the average. Southwest of Sudana nd northeast South Sudan recorded minimum temperature cooler than the long-term mean. Much of the rest of these areas recorded minimum and maximum temperature that ewas near average or warmer than the long-term average.

Much of the rest of the GHA recorded maximum and minimum temperature that was warmer than the long-term average.

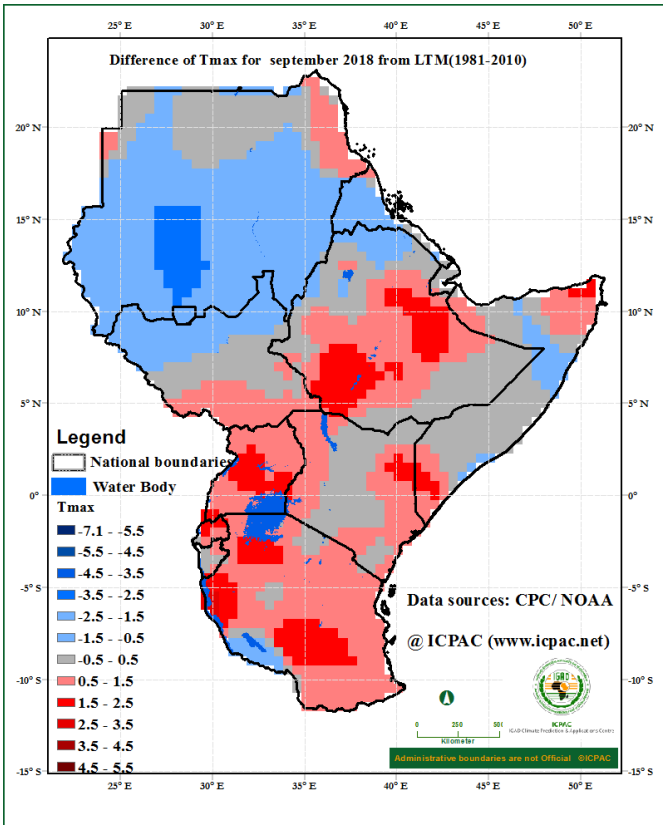

Figure 4a: Maximum temperature anomalies for September 2018 from LTM, 2008-2017 (*Data Source: ECMWF)*

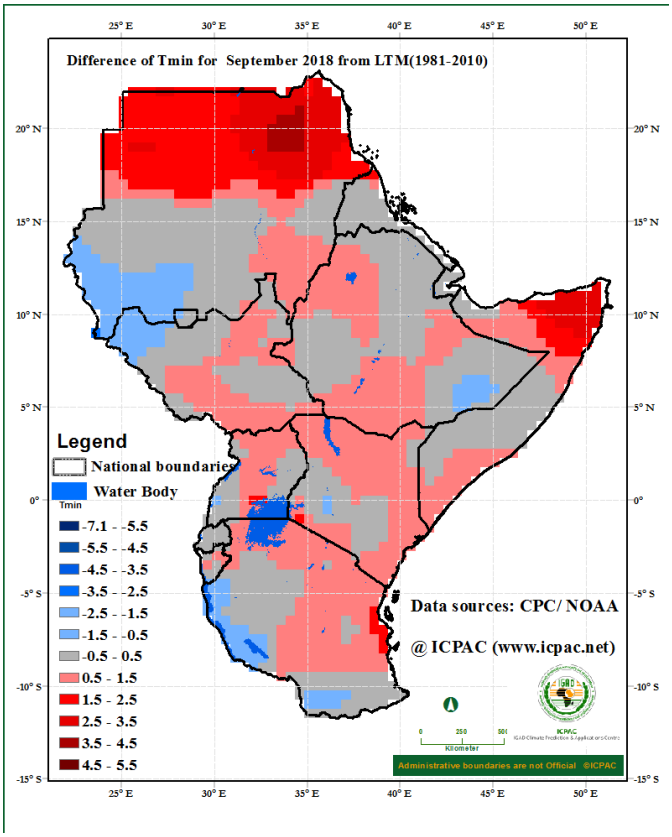

Figure 4b: Minimum temperature anomalies for September 2018 from LTM, 2008-2017 *(Data Source: ECMWF)*

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for September 2018 (Figure 9) indicates that:

Sudan and South Sudan: Southern part of Sudan, and eastern South Sudan showed signs of improved vegetative conditions as compared to the long-term average. However southeastern part of Sudan and southeast South Sudan showed signs of deterioration in vegetative conditons.

Uganda and Ethiopia: central Ethiopia and several parts of Uganda showed signals of deterioration in vegetative condition as compared to the long term average.

Kenya and Tanzania: north-central to south-central Kenya, and western and eastern Tanzania showed signs of improved vegetative conditions as compared to the long-term average.

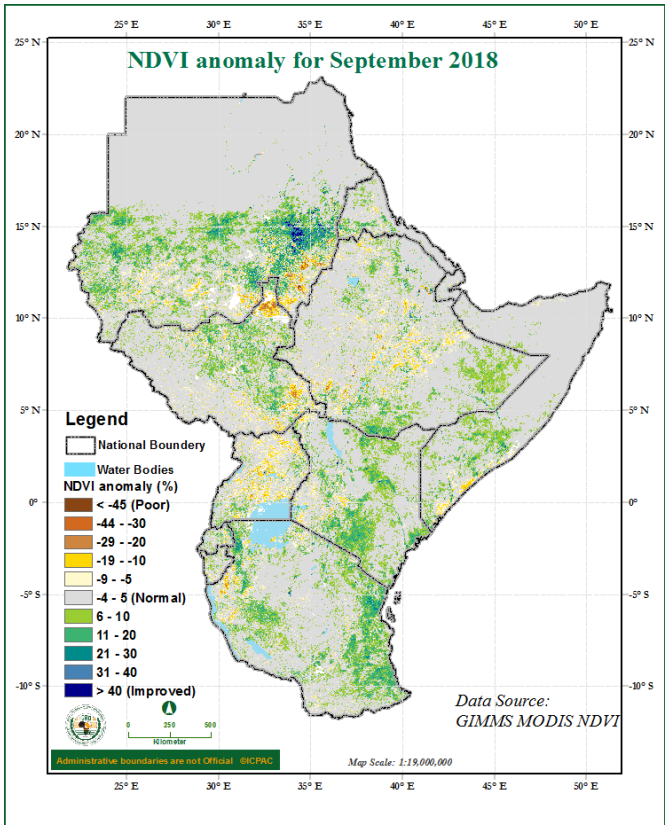

Figure 9: Normalized Difference Vegetation Index (NDVI) for September 2018*(Data Source: USGS-NASA)*

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 September 2018. (Figure 9).

4. STATUS OF THE CLIMATE SYSYEMS

The Sea Surface Temperature (SST) anomaly during the period of 9th September to 6th October 2018 showed that equatorial Pacific Ocean was dominated by warmer than the average SST anomaly (Figure 5), this situation currently presents a neutral, Oceanic Nino Index (ONI) (Figure 7). Models forecasting El Niño Southern Oscillation ENSO event show a an increased likelihood of an El Niño phase toward the end of the year 2018. Near average to cooler than average SST conditions dominated eastern equatorial Indian Ocean (Figure 5), with near normal to warmer than normal SST in the western equatorial Indian Ocean. This pattern has presented a positive phase of the Indian Ocean Dipole (IOD) (Figure 7). Models show a likelihood of a persistent positive IOD towards the end of the year 2018.

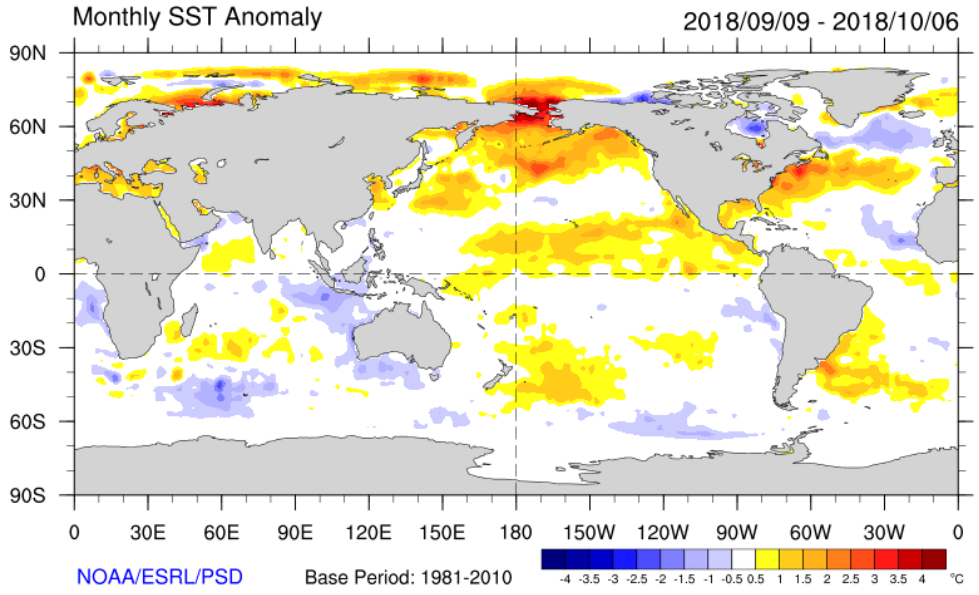

Figure 5: Sea Surface Temperature anomalies for the period 9thSeptember 2018 to 6thOctober 2018 (*Source: NOAA/ESRL/PSD*)

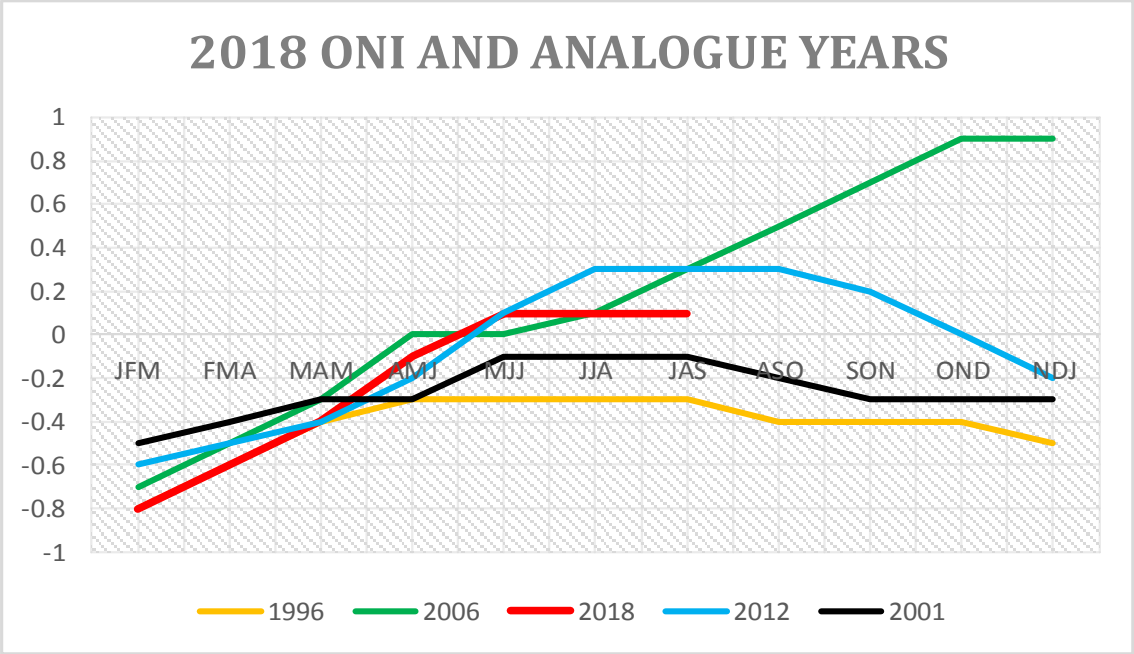

Figure 6: The Indian Ocean Dipole (IOD) during 2018 and analogue years.

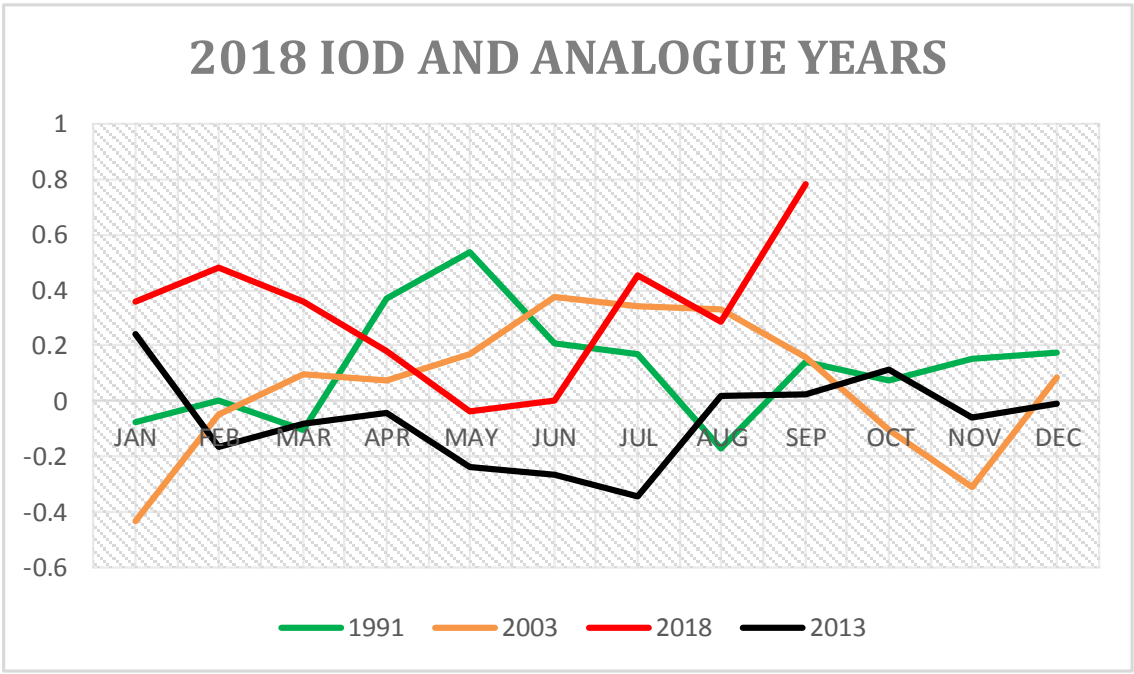

Figure 7: The Oceanic Nino Index (ONI) during 2018 and analogue years.

5. CLIMATE OUTLOOK FOR NOVEMBER 2018

The climate outlook for temperature and precipitation for the month of November 2018 are generated from the GHA region customized Weather Research and Forecasting (WRF) model.

The November 2018 rainfall forecast

During the month of November 2018, rainfall will be concentrated over much of South Sudan, Djibouti, Somalia, Uganda, Rwanda, Burundi, over several parts of Ethiopia, southern part of Sudan, central and southern Eritrea, as well as parts of northwest of Tanzania (Figure 8a). Much of the areas covering northern Sudan, western Eritrea, north-western Ethiopia, north and eastern Kenya, and much of Tanzania are likely to record small amount of rainfall or remain generally dry.

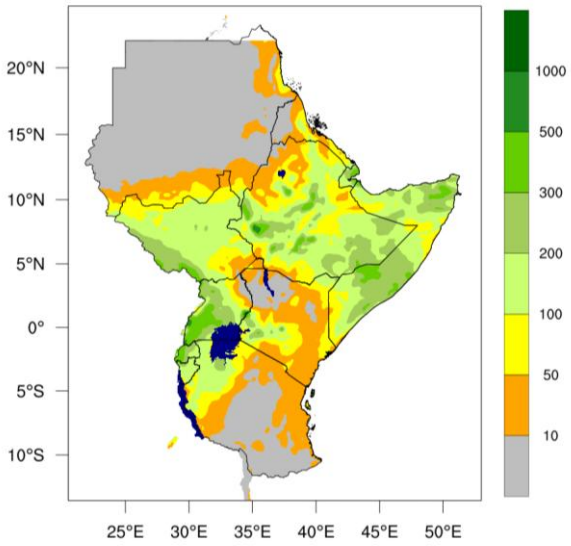

Figure 8a: Forecast of rainfall total for November 2018

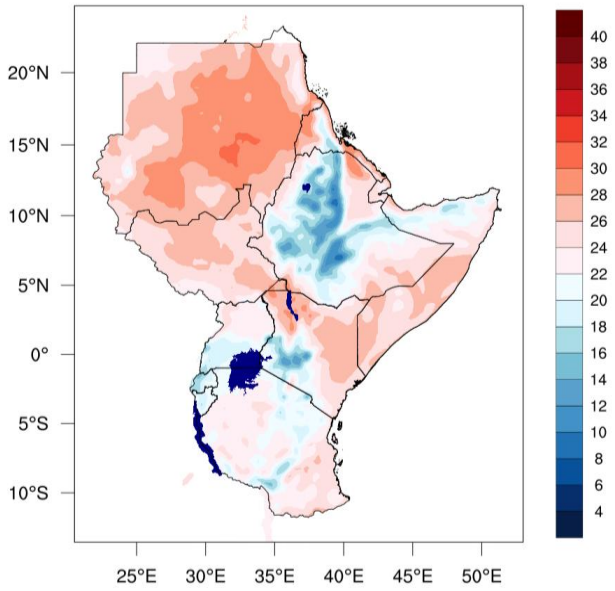

Figure 8b: Mean temperature forecast for November 2018.

November 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over western and central Ethiopian highlands, southern parts of Uganda, western and central Kenya, over much of Rwanda, Burundi, and over parts of central and northern 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 are provided below.

Impacts of observed climate conditions during September 2018

During the month of September 2018,several areas especially in the northern sector and western equatorial sector of the GHA experienced good rainfall performance leading to improved pasture and water conditions.

Potential impacts for November 2018 climate outlook

In the month of November 2018, the forecasted climate is likely to result to improved water availability, improved crop and pasture conditions leading to good prospects for crop and livestock performance especially in parts of the northern sector as well as western part of equatorial of sector of the GHA. South western parts of Sudan, northern part of South Sudan, and western Ethiopia are expected to experience high rainfall amounts which might lead to localised flooding and the associated impacts.

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