I C P A C

IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for January 2018

1. INTRODUCTION

This bulletin reviews the January 2018 climate condition over the Greater Horn of Africa (GHA) region and highlights the March 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 discussed the climate patterns that prevailed in the month of January 2018, while the dominant weather systems are discussed in the section 4. In section 5, the March 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from March 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^{o} and 5^{o} latitude, with the northern and southern sectors occupying the rest of the northern and southern parts of the region respectively.

2. HIGHLIGHTS

Rainfall was mainly experienced in southern sector and southern part of the equatorial sector of the GHA. Much of the equatorial sector as well as northwestern part of the southern sector of the GHA experienced depressed rainfall conditions. However much of the rest of the GHA experienced near normal rainfall conditions, except for a few areas in southwestern equatorial sector and in several parts of eastern and southern parts of Tanzania which had enhance rainfall conditions during January 2018 (Figure 2 and Figure 3).

Warmer than the average maximum temperatures conditions was experienced mainly over south-central parts of northern sector, as well as western and southeastern parts of the equatorials sector of GHA during the month of January 2018 (Figure 4a). Much of the northern parts of the northern sector as well as several areas in southeastern equatorials sector as well as southern sector recorded cooler than the average condition for maximum temperature. Warmer than the average minimum was experienced mainly in southwestern part of the northern, and several parts of western and central parts of the equatorial sector of the GHA during the month of 2018.

Improvement in water and pasture conditions resulting to prospects of good crop, and livestock productivity following the rainfall condition for the month of January 2018 in the southern sector as

well as southwestern parts of the equatorial sector of the GHA. However a few places especially in the eastern part of the equatorial sector experienced impacts of depressed rainfall conditions that has led to deterioration of water resources, and general water stress as direct negative impacts of depressed rainfall conditions.

In January 2018, 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 2018 and the beginning of 2018, while the IOD shows more likelihood of persisting in the positive phase during this period.

In the month of March 2018, 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 JANUARY 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 January 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

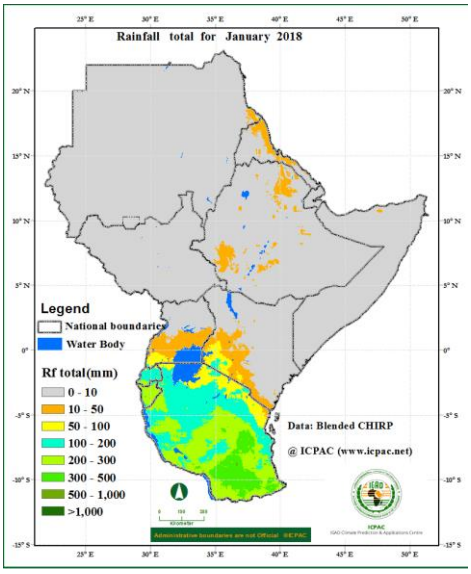

Figure 1: Spatial distribution of rainfall during the month of January 2018*(Data Source : Blended CHIRPS)*

The highest range of rainfall recorded was between 300mm and 500mm, which occurred in the southern part of Tanzania.

Burundi, Rwanda, and Tanzania: Much of these areas recorded more than 100mm, with Burundi and western and southern parts of Tanzania recorded between 200mm and 500mm. Much of Rwanda, Burundi, and eastern and southern parts of Tanzania recorded above normal rainfall within moderately wet to severely wet condition. Much of the rest of these places recorded near normal rainfall conditions except for a few places in northwestern Tanzania which recorded below normal rainfall conditions.

Uganda, Kenya, Ethiopia and Eritrea: southern part of Uganda, southwestern Kenya, a few places in southwest and north east Ethiopia, as well as

northern coast of Eritrea recorded rainfall of between 10mm and 100mm. Much of these areas recorded below the average rainfall condition except for western part of Eritrea which recorded rainfall greater than the average amount. Several parts of Uganda, Ethiopia, and central and southeastern Kenya experienced moderately dry to severely dry condition.

Much of the rest of the GHA recorded less than 10mm of rainfall. These areas experienced near normal or generally dry rainfall conditions.

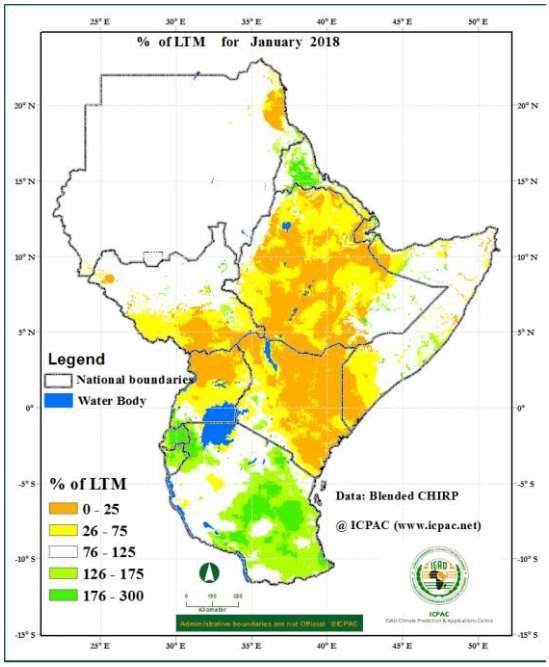

Figure 2: Percentage of average rainfall for January 2018 *(Data Source: Blended CHIRPS)*

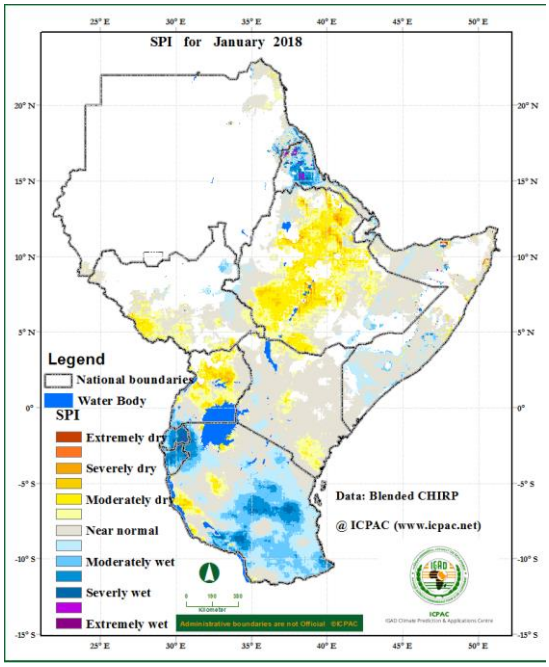

Figure 3: Standardized Precipitation Index for January 2018 *(Data Source: Blended CHIRPS)*

Temperature Conditions

The maximum temperature condition during the month of January 2018 was that:

Sudan, Eritrea, Somalia and Tanzania: Much of Sudan, northern and southern parts of Eritrea, northern Somalia, as well as northeastern and a few areas in eastern and southern Tanzania experienced cooler than the average condition for maximum temperature.

South Sudan, Uganda, Ethiopia, and Kenya: south eastern South Sudan extending to southwestern Ethiopia, much of western and part of eastern Uganda, as well as parts of southeastern Kenya experienced warmer than the average condition for maximum temperature. Northeastern part of Ethiopia experienced cooler than the average conditions for maximum temperature.

Much of the rest of the GHA experienced near the average condition for maximum temperature.

The Minimum temperature condition during the month of January 2018 was that:

Sudan, Eritrea, Somalia and Tanzania: Much of Sudan, western and central Eritrea, and over a few areas in the north of Somalia and northeastern Tanzania experienced cooler than the average condition for minimum temperature.

South Sudan, Ethiopia, Uganda and Kenya: southern part of South Sudan extending to southwestern Ethiopia; western and eastern part of Uganda; and in several parts of central and southeastern Kenya warmer than the average condition for minimum temperature was recorded.

Much of the rest of the GHA recorded near the average condition for minimum temperature.

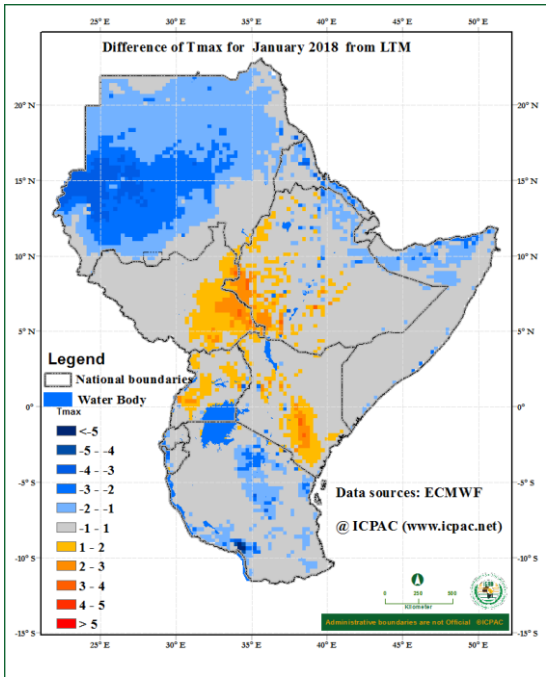

Figure 4a: Maximum temperature anomalies for January 2018 *f*rom LTM, 2008-2016 (*Data Source: ECMWF)*

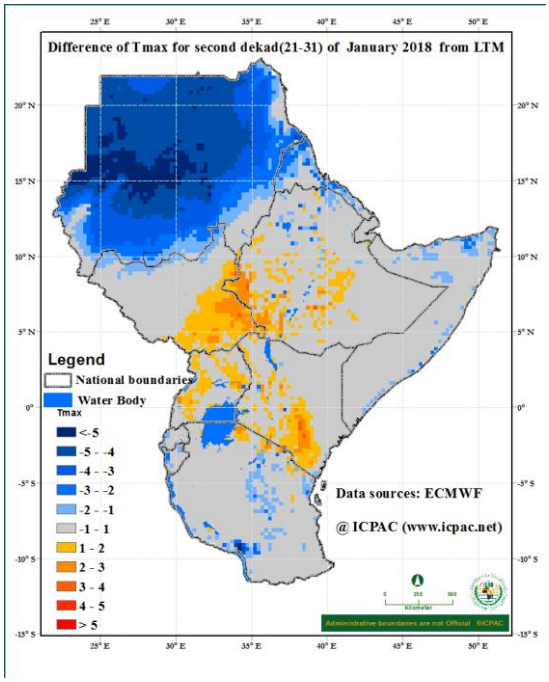

Figure 4b: Minimum temperature anomalies for January 2018 from LTM, 2008-2016 *(Data Source: ECMWF)*

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for January 2018 indicates that*

Ethiopia, Uganda, Uganda, and Somalia: much of Uganda, eastern margins of central of Ethiopia and southwestern part of Ethiopia, central and eastern Kenya extending to south of Somalia experience deterioration in vegetative conditions as compared to the long term average.

South Sudan, Tanzania: eastern part of South Sudan and eastern Tanzania recorded improvement in vegetative conditions as compared to the long term average, however northeastern part of Tanzania showed deterioration in vegetative conditions as compared to the long term average

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 January 2018. (Figure 9).

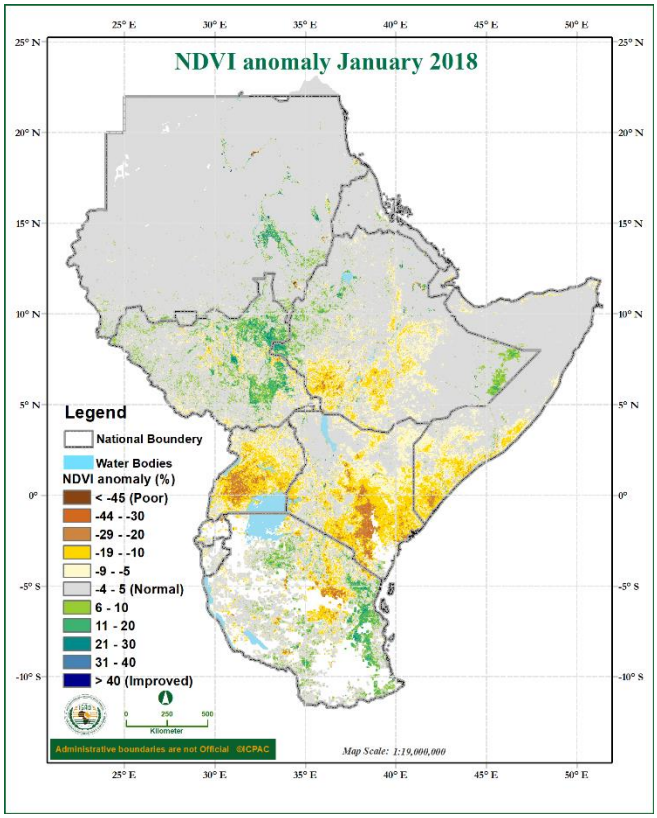

Figure 9: Normalized Difference Vegetation Index (NDVI) for January 2018 over the Greater Horn of Africa ***(Data Source: USGS-NASA*****)**

4. STATUS OF THE CLIMATE SYSYEMS

The Sea Surface Temperature (SST) anomaly during the month of January 2018 showed that over central equatorial Pacific Ocean stretching towards the eastern equatorial Pacific region (Niño 4 to Niño 1&2 areas), cooler than 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 weak La Niña phase (Figure 6) however models show an increased likelihood of persistence of a negative El Niño Southern Oscillation (ENSO) phase through the first quarter of the year 2018. Near average to cooler than average SST conditions dominated western and the eastern sides of equatorial Indian Ocean (Figure 5) This pattern has presented a weak but positive phase of the Indian Ocean Dipole (IOD) (Figure 7). Models show persistence of a positive phase of the IOD during the initial periods of year2018.

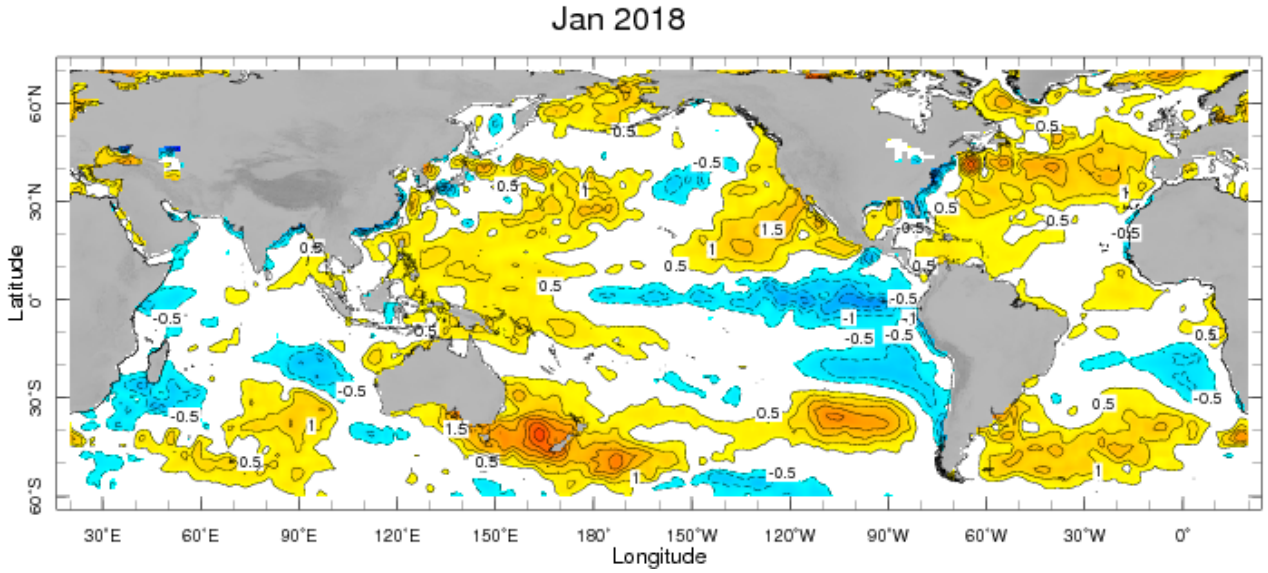

Figure 5: Sea Surface Temperature anomalies for the period 10 January 2018 to 08 January 2018 (*Source: NOAA/ESRL/PSD***)**

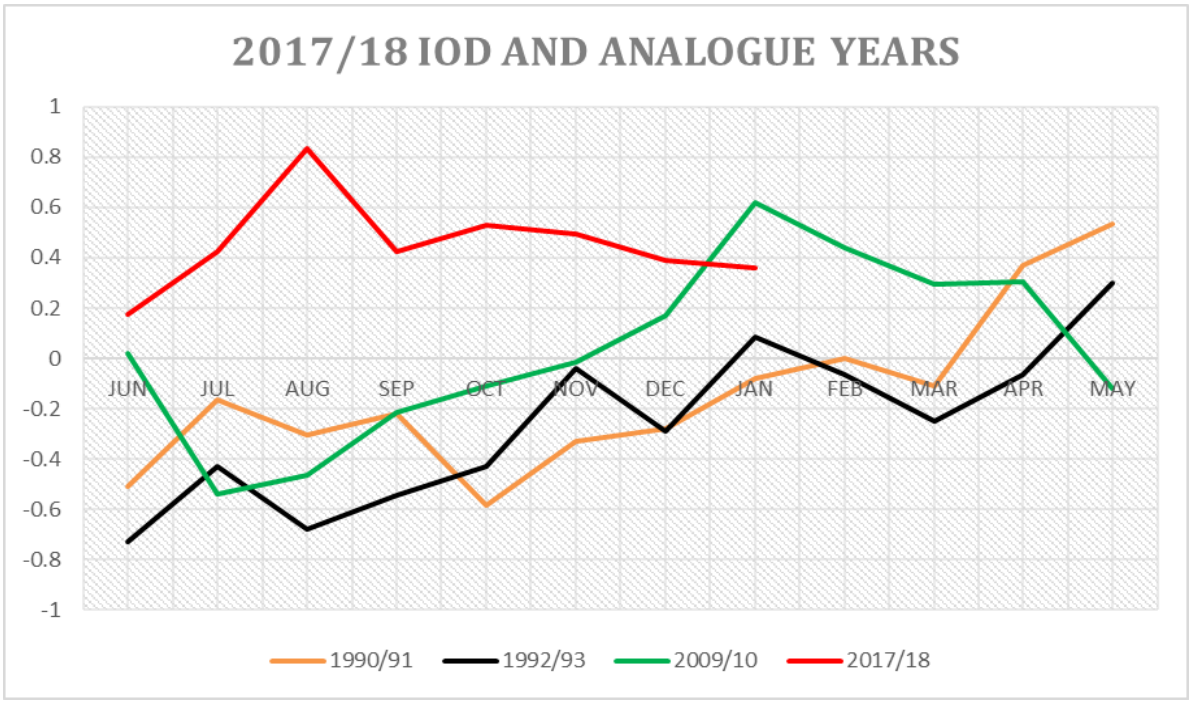

Figure 6: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

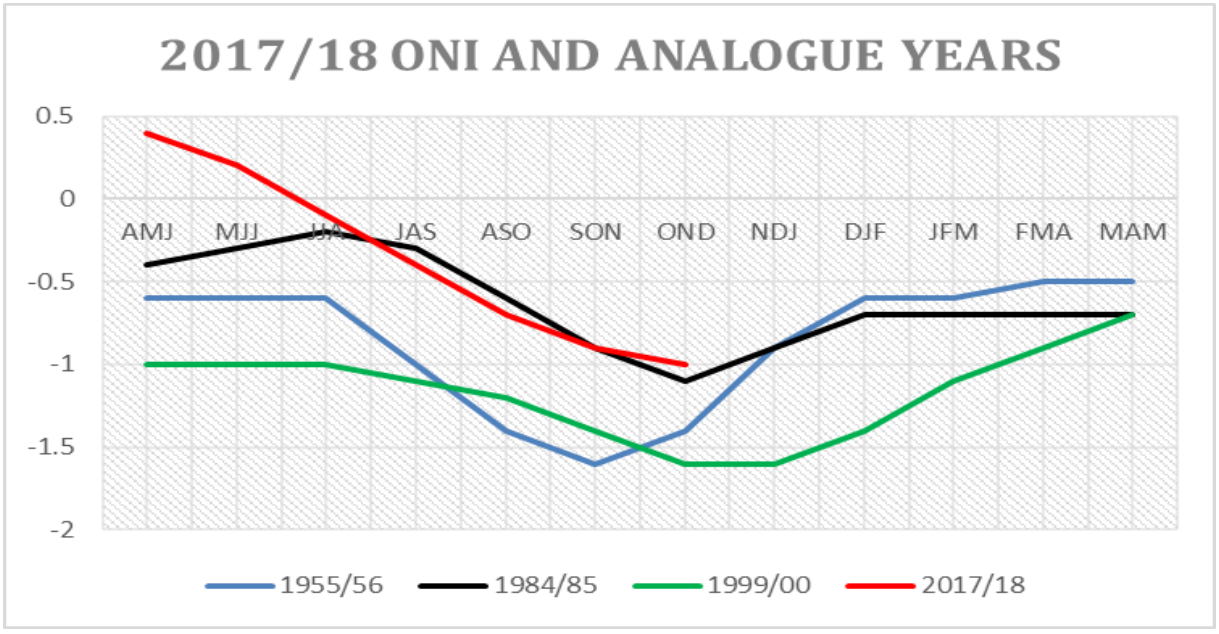

Figure 7: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR MARCH 2018

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

The March 2018 rainfall forecast

During the month of March 2018, rainfall will be concentrated over much of Tanzania, Rwanda, Burundi, and in parts of Rwanda, Burundi, southern parts of Uganda as well as in southern part of

Kenya. (Figure 8a). Areas covering southern part of South Sudan, southwestern Ethiopia, and southern Somalia are also likely to receive rainfall. Much of the areas covering Sudan, north of South Sudan, Eritrea, Djibouti, northern and eastern Ethiopia, northern and central Somalia, Northern and central Uganda, and over much of northern Kenya are likely to remain generally dry or record small amounts of rainfall.

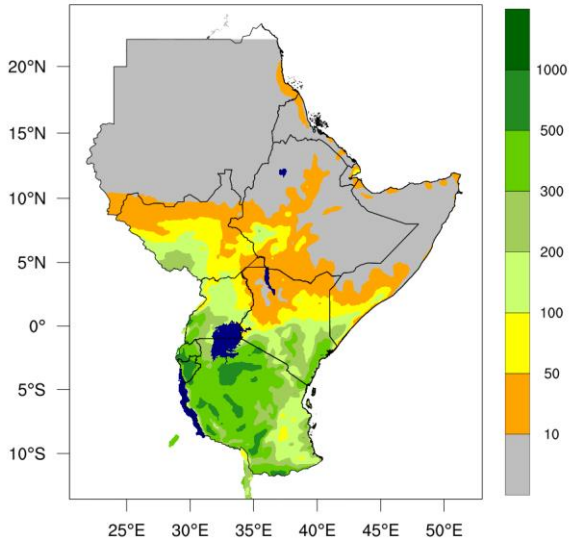

Figure 8a: Forecast of rainfall total for March 2018

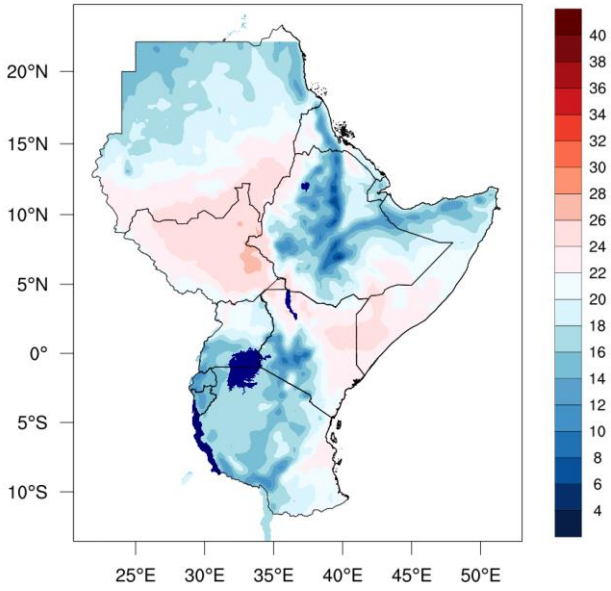

Figure 8b: Mean temperature forecast for March 2018.

The March 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over northern and central Sudan, central and southern Eritrea, over much of Djibouti, Ethiopia, northern Somalia, Uganda, western and central Kenya, Rwanda, Burundi, and in western Tanzania. Much of the rest of the GHA is likely to record average temperatures warmer than 22°C, with much of South Sudan, southern part of Sudan, northwestern Uganda, northern and eastern parts of Kenya, southern Somalia, and part of east Tanzania likely to record temperature exceeding 22°C (Figure 8b).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climate conditions and those from the March 2018 rainfall and temperature forecast are provided below.

Impacts of observed climate conditions during January 2018

During the month of January 2018, 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 January 2018. 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 March 2018 climate outlook

In the month of March 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 of the GHA. Southwestern and southern parts of Tanzania, are likely to experienced high rainfall which might lead to flooding and the associated impact. While much of the eastern part of the equatorial sector of the GHA is likely to remain hot and dry resulting to continued deterioration in water and pasture resources.

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