I C P A C

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

1. INTRODUCTION

This bulletin reviews the February 2018 climate condition over the Greater Horn of Africa (GHA) region and highlights the April 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 February 2018, while the dominant weather systems are discussed in the section 4. In section 5, the April 2018 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from April 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 part of the region respectively.

2. HIGHLIGHTS

Rainfall was mainly experienced in western parts of the southern sector, and south western part of the equatorial sector of the GHA. Western part of the equatorial sector as well as south-central part of the northern sector of the GHA also received rainfall. Much of the eastern part of the southern sector, central and eastern parts of the equatorial sector, and western part of the southern sector of the GHA experienced depressed rainfall conditions. Western equatorial sector, and southern parts of the northern sector experienced above normal rainfall conditions during February 2018 (Figure 2 and Figure 3).

Warmer than the average condition for maximum temperature was experienced mainly over western part of the northern sector, western and central equatorial sector and over much of the southern sector of the GHA during the month of February 2018 (Figure 4a). Much of the rest of GHA recorded near the average condition for maximum temperature. Warmer than the average condition for minimum was experienced mainly in western parts of the northern sector an in a few places in central and western equatorial sector as well as northwestern part of the southern sector of the GHA during the month of February 2018.

Places in the eastern part of the equatorial sector as well as eastern parts of the southern sector experienced impacts of depressed rainfall conditions that has led to deterioration of water resources, and pasture conditions, and general water stress as direct negative impacts of depressed rainfall conditions. Improvement in water and pasture conditions resulting to prospects of good crop, and livestock productivity following the rainfall condition for the month of February 2018 in the western equatorial sector and southern parts of the northern sector of the GHA.

In February 2018, the Oceanic Nino Index (ONI), one of the primary indices used to monitor the El Nino-Southern Oscillation (ENSO) signal showed a negative 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 negative phase in the coming few months, while the IOD shows more likelihood of persisting in the positive phase during this period.

In the month of April 2018, rainfall is expected to be concentrated over much of the equatorial sector and southern parts of the northern sector of the GHA. A few areas in the southern parts of the equatorial sector of the GHA are also likely to record some rainfall activities (Figure 8a).

3. CLIMATE PATTERNS IN FEBRUARY 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 February 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

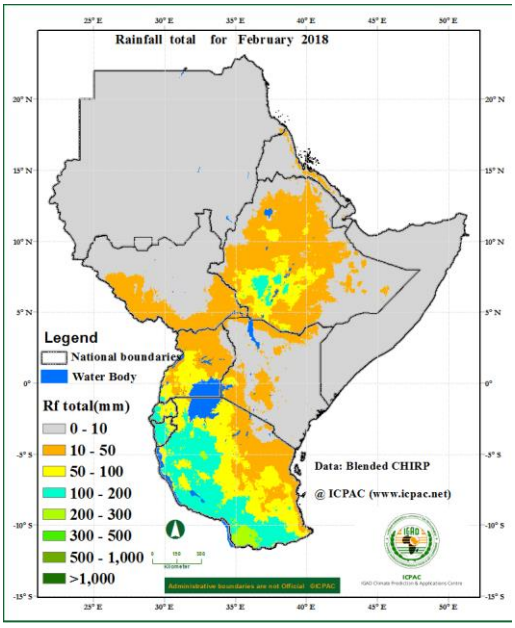

Figure 1: Spatial distribution of rainfall during the month of February 2018*(Data Source : Blended CHIRPS)*

The highest range of rainfall recorded was between 200mm and 300mm, which occurred in the southern part of Tanzania.

Burundi, Rwanda, and Tanzania: several parts of western Rwanda, Burundi, and western Tanzania recorded rainfall of between 100mm and 200mm, with southern parts of Tanzania recorded between 200mm and 300mm. Much of the rest of these areas recorded between 10mm and 100mm except for northeastern Tanzania which recorded less than 10mm. Much of these areas experienced below normal to near normal rainfall, except for eastern Rwanda and northwestern part of Tanzania, with western and much of eastern Tanzania indicating moderately dry to severely dry condition.

Uganda, South Sudan, Ethiopia and Eritrea: Much of Uganda, western and southern South Sudan,

western and central Ethiopia, and central Eritrea recorded rainfall of between 10mm and 50mm, however southwestern Ethiopia recorded rainfall of between 100mm and 200mm. Much of these areas recorded above the average rainfall condition with moderately wet to extremely wet condition, except for a few areas in south-central South Sudan, and eastern Ethiopia which experienced below the average rainfall conditions.

Kenya: Much of Kenya recorded rainfall not exceeding 10mm except for western and central parts of Kenya which recorded rainfall of betwen10mm and 100mm. This was below the long term average rainfall amount which resulted into moderately dry to severely dry conditions in the western, central and southern part of the country.

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

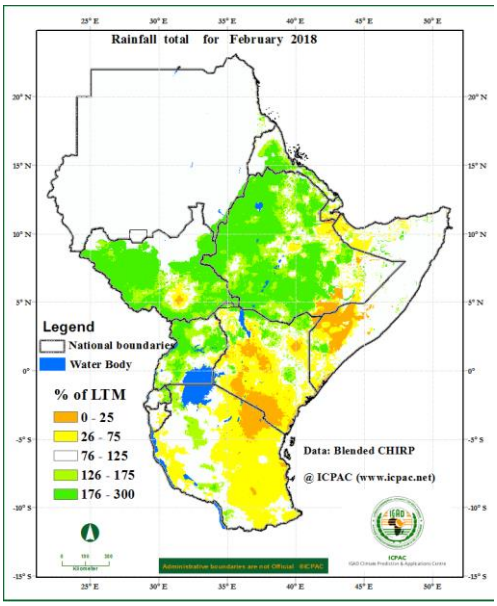

Figure 2: Percentage of average rainfall for February 2018 *(Data Source: Blended CHIRPS)*

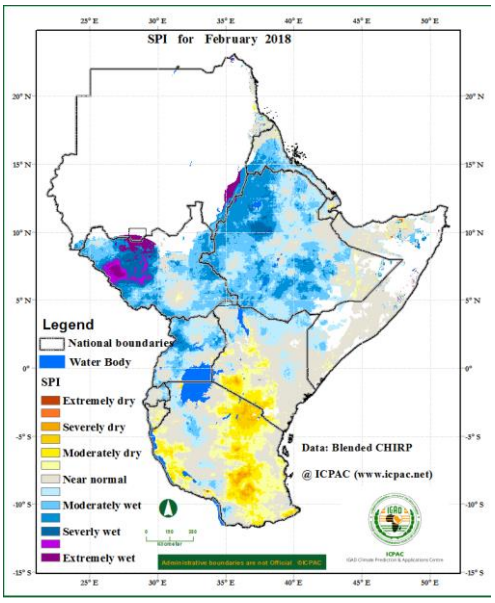

Figure 3: Standardized Precipitation Index for February 2018 *(Data Source: Blended CHIRPS)*

Temperature Conditions

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

Sudan, and Uganda: Much of these areas experienced conditions warmer than the average for maximum temperature, except for parts of northwest and southern Uganda which had near normal conditions.

Eritrea and Ethiopia: A few places in western Eritrea and western and northern Ethiopia experienced conditions warmer than the average for maximum temperature, some isolated areas in central Ethiopia recorded conditions cooler than the average for the maximum temperature.

South Sudan, Kenya and Tanzania: Northern and southwestern South Sudan, in parts of western and southern Kenya, and over much of Tanzania except for the southern parts experienced warmer than the average condition for maximum temperature.

Much of the rest of the GHA including **Djibouti**, **Somalia**, **Rwanda** and **Burundi** experienced near the average condition for maximum temperature.

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

Sudan, and South Sudan: Much of Sudan and in the northern and eastern parts of South Sudan conditions warmer than average for minimum temperature was recorded.

Eritrea, Ethiopia, Uganda, Kenya, Burundi and Tanzania: A few places in western Eritrea, central Ethiopia, eastern and southern Uganda, central Burundi, and northwestern and central Tanzania experienced warmer than the average condition for minimum temperature.

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

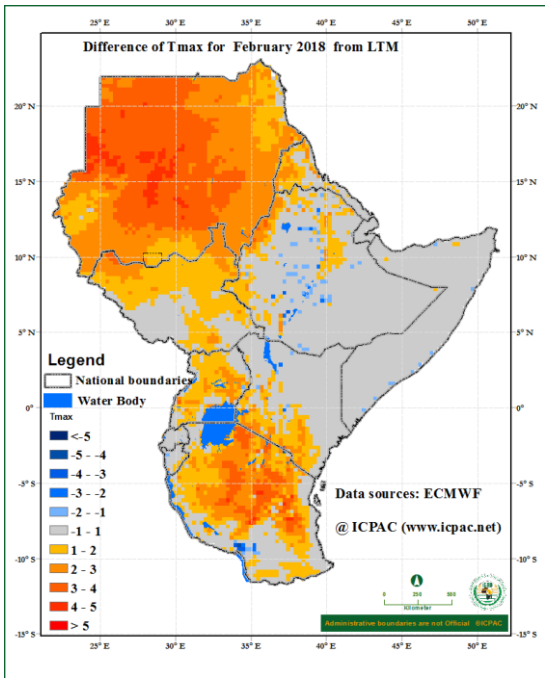

Figure 4a: Maximum temperature anomalies for February 2018 *f*rom LTM, 2008-2017 (*Data Source: ECMWF)*

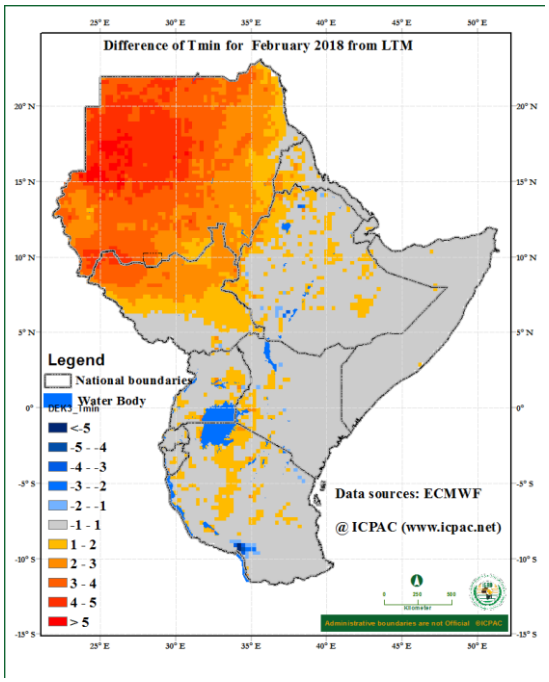

Figure 4b: Minimum temperature anomalies for February 2018 from LTM, 2008-2017 *(Data Source: ECMWF)*

Vegetation Condition Indicators

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

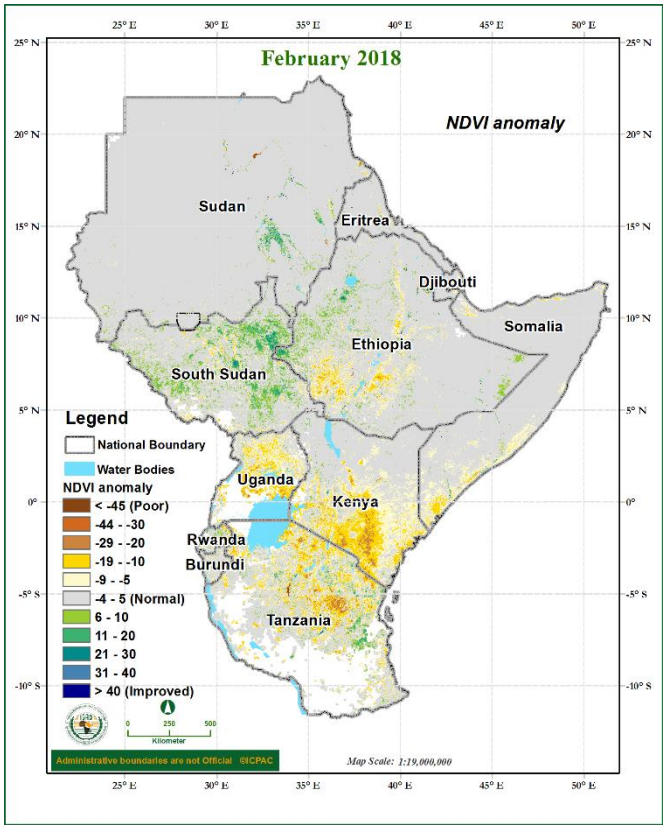

Figure 9: Normalized Difference Vegetation Index (NDVI) for February 2018 over the Greater Horn of Africa ***(Data Source: USGS-NASA*****)**

Ethiopia, Uganda, Kenya, Somalia and Tanzania: Parts of southwestern Ethiopia, much of Uganda, southern parts of Kenya, extending to south of Somalia experience deterioration in vegetative conditions as compared to the long term average.

South Sudan: parts of east and west of South Sudan have shown improvement 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 February 2018. (Figure 9).

4. STATUS OF THE CLIMATE SYSYEMS

The Sea Surface Temperature (SST) anomaly during the month for the period of 4th February to 3rd March 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 dominant, with the area stretching from central towards western equatorial Pacific Ocean showing warmer than average SST (Figure 5), this situation presents a negative Oceanic Nino Index (ONI) and a La Niña phase (Figure 6) models show an increased likelihood of persistence of a negative El Niño Southern Oscillation (ENSO) phase through to the mid second quarter of the year 2018. Near average to warmer than average SST conditions dominated western sides of equatorial Indian Ocean with average to cooler than the average conditions over the eastern equatorial Indian Ocean (Figure 5) This pattern has presented a positive phase of the Indian Ocean Dipole (IOD) (Figure 7). Models show persistence of a positive phase of the IOD through to the second quarter of year2018.

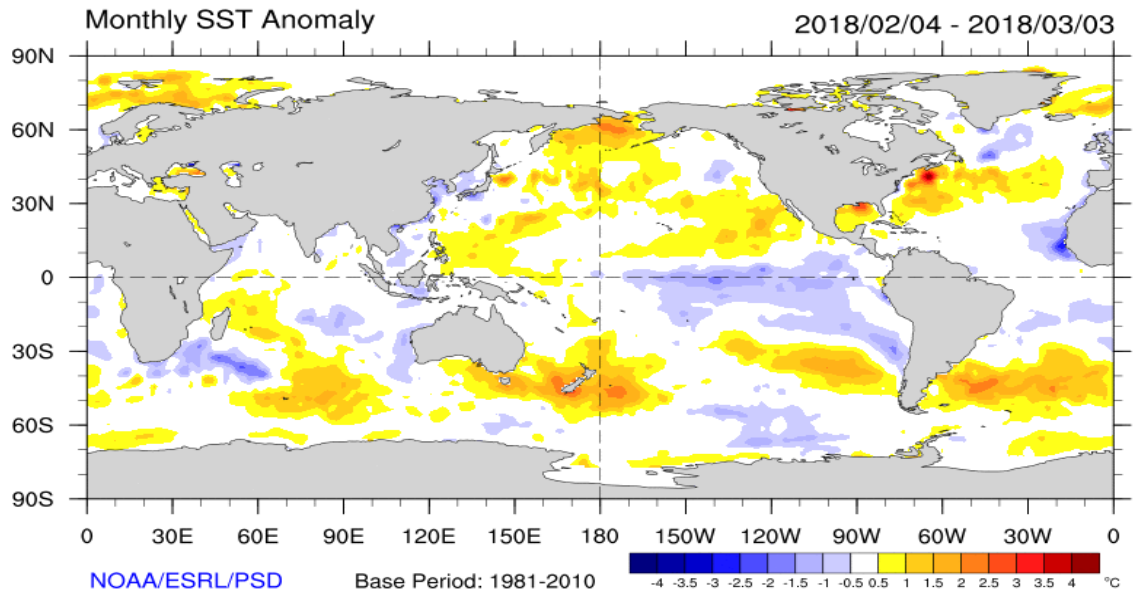

Figure 5: Sea Surface Temperature anomalies for the period 04 February 2018 to 03 March 2018 (*Source: NOAA/ESRL/PSD***)**

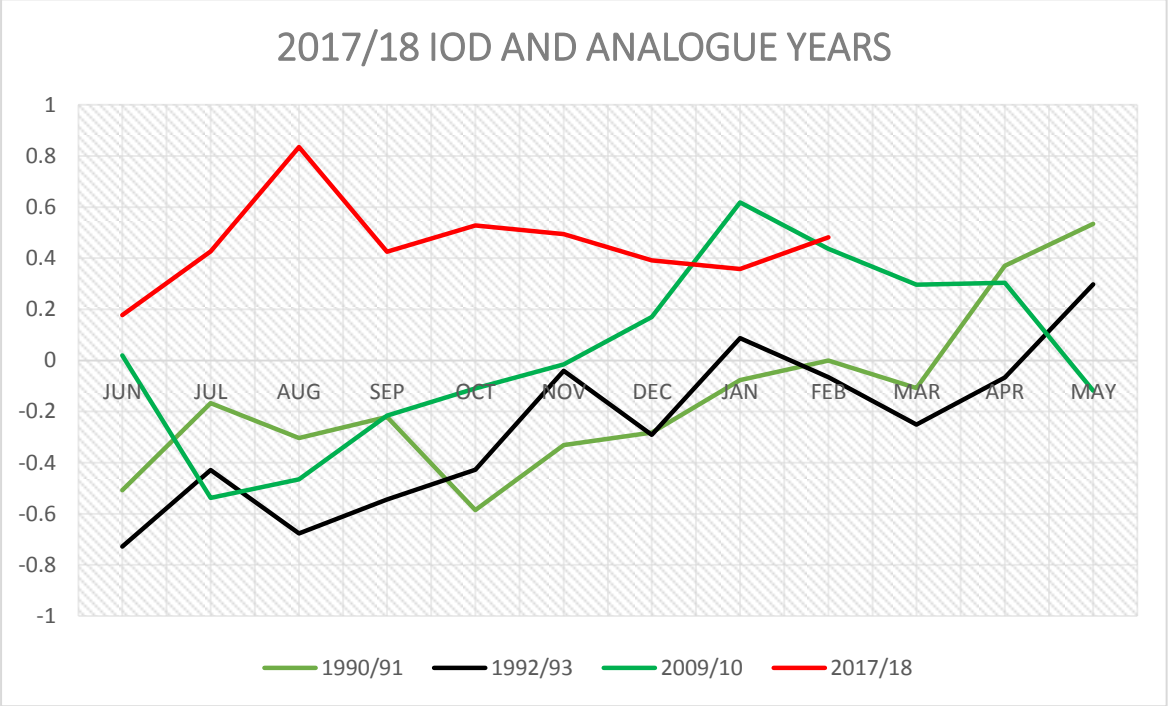

Figure 6: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.

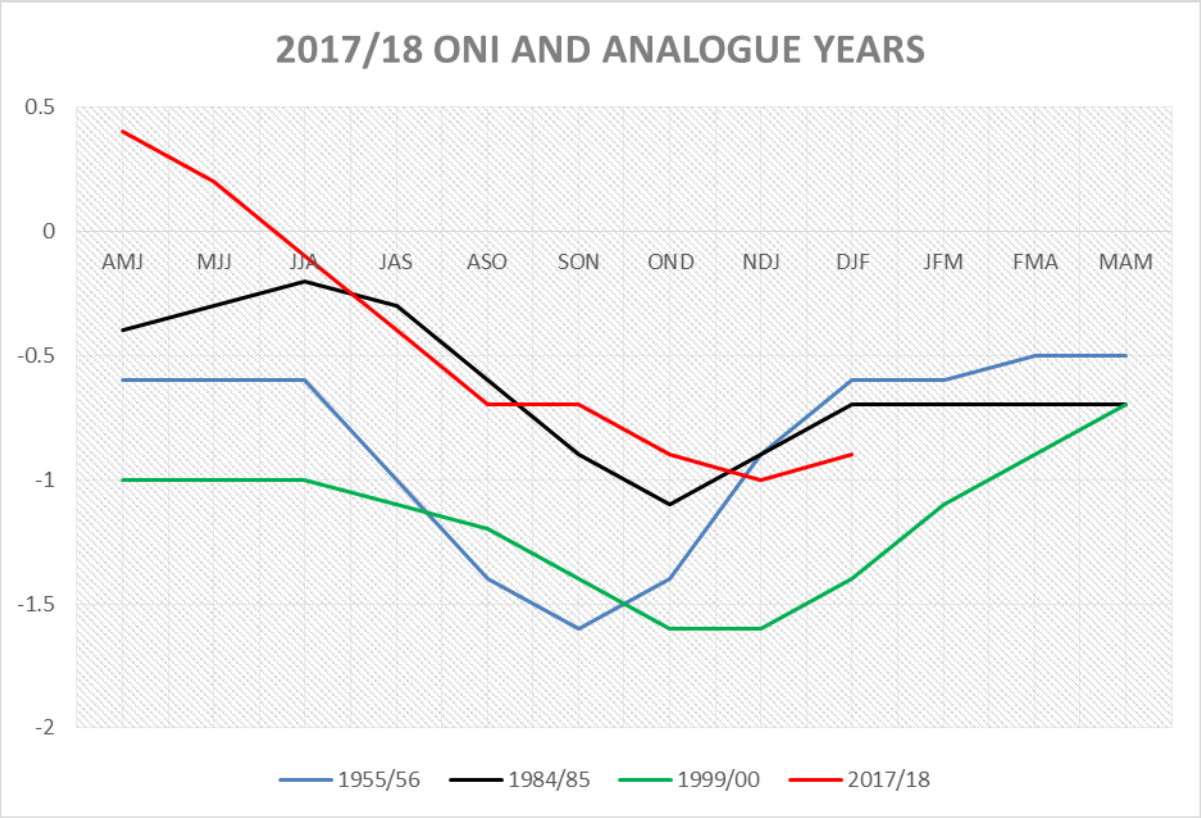

Figure 7: The Oceanic Nino Index (ONI) during 2016/17 and analogue years.

5. CLIMATE OUTLOOK FOR APRIL 2018

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

The April 2018 rainfall forecast

During the month of April 2018, rainfall will be concentrated over much of Uganda, Kenya, Rwanda, Burundi, Somalia, northern parts of Tanzania, southern parts of South Sudan, over much of the southern and central parts of Ethiopia. (Figure 8a). Areas covering central and southern Eritrea, partsof Djibouti and southern Tanzania are also likely to receive some rainfall. Much of the areas covering Sudan, north of South Sudan, western Eritrea, northern Ethiopia, and southwestern Tanzania are likely to remain generally dry or record small amounts of rainfall.

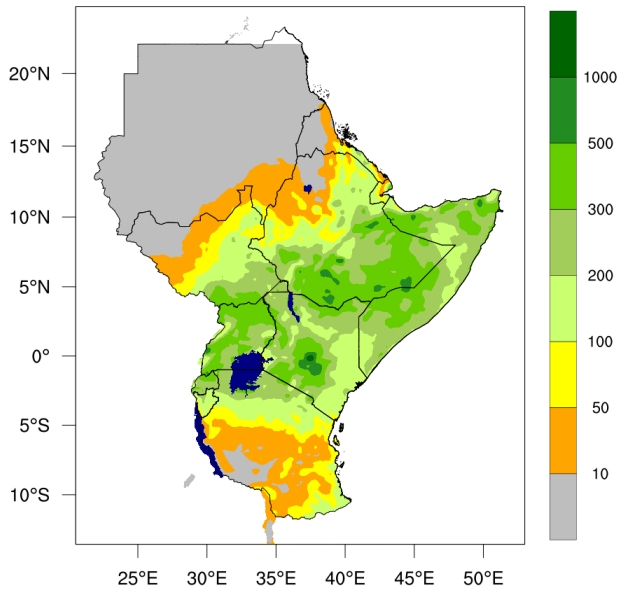

Figure 8a: Forecast of rainfall total for April 2018

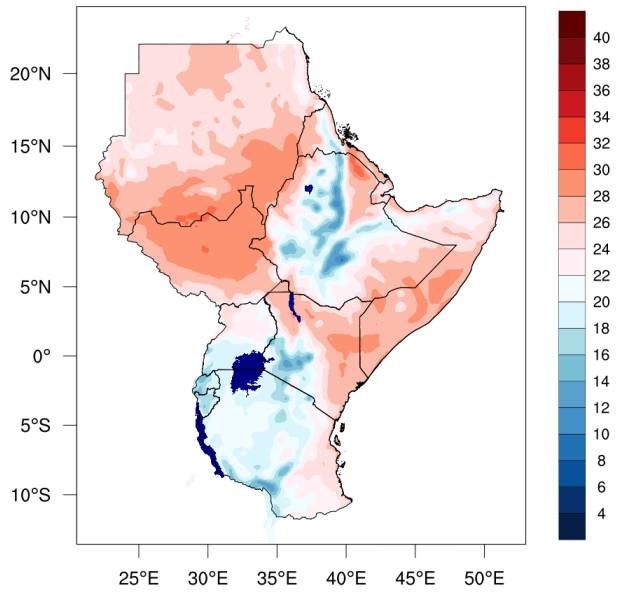

Figure 8b: Mean temperature forecast for April 2018.

The April 2018 Temperature forecast

Average temperature of cooler than 22°C is likely to be observed over central Eritrea, Ethiopian highlands, southern Uganda, western and central Kenya, Rwanda, Burundi, and in western and central parts of 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 in February 2018 and those from the April 2018 rainfall and temperature forecast are provided below.

Impacts of observed climate conditions during February 2018

During the month of February 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 February 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 April 2018 climate outlook

In the month of April 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 equatorial sector and southern parts of the northern sector of the GHA. Parts of Uganda, central and western Kenya, several parts of Rwanda, southern and eastern Ethiopia, and northern and southwestern Somalia are likely to experienced high rainfall amounts which might lead to flooding and the associated impact.

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