ICPAC

IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for March 2019 and Forecasts for May 2019

1. INTRODUCTION

This bulletin reviews the March 2019 climate conditions over the Greater Horn of Africa (GHA) region and highlights the May 2019 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 Section 2. Section 3 discusses the climate patterns that prevailed in the month of March 2019, while the dominant weather systems are discussed in Section 4. In Section 5, the May 2019 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from May 2019 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°N and 5°S latitude, while the northern and southern sectors lie in the north and south of the equatorial region respectively.

2. HIGHLIGHTS

Rainfall was recorded in several parts the southern sector and southern part of the equatorial sector, and in few places in south-central and southwest part of the northern sector of the GHA. Several places in equatorial sector, and a few places in southern and eastern part of the northern sector, and eastern part of the southern sector of the GHA recorded rainfall that was below normal. Much of the rest of the GHA recorded near normal rainfall, except for northwest Ethiopia, northeast Kenya, and central and southwest part of Tanzania which recorded above normal rainfall, during the month of March 2019 (Figure 2 and 3).

Several parts of the equatorial sector and southern sector of the GHA recorded maximum and minimum temperature warmer than the climatological mean. Most of the northern, western, and southeast part of the northern sector of the GHA recorded maximum and minimum temperature that was cooler than the climatological mean for the month of March 2019.

Some areas in the equatorial sector of the GHA reported continued dry conditions following depressed rainfall in the September to December 2018 short rain season, which has led to water stress related impacts. The general rainfall condition in the southern sector of GHA resulted in the improvement of water and pasture conditions which might increase prospects of good crop, and livestock productivity.

By March 2019, the Oceanic Nino Index (ONI), a primary index used to monitor the El Nino-Southern Oscillation (ENSO) had a positive signal (Figure 7a) denoting an El Nino

condition. The Indian Ocean Dipole (IOD) indicated a weak positive index (Figure 7b).The ONI and IOD are forecasted to persist in positive and neutral phases respectively over much of the second quarter of 2019.

In the month of May 2019, rainfall is expected to be concentrated over much of equatorial sector, southern part of the northern sector, and northern and eastern parts of the southern sector of the GHA (Figure 8a).

3. CLIMATE PATTERNS IN MARCH 2019

The rainfall amounts (Figure 1) and performance as compared to the climatological mean (1981-2010) using percentage of long term average (Figure 2) and Standardized Precipitation Index (SPI) (Figure 3) for March 2019 are provided in this section. The minimum (Figure 4b) and maximum (Figure 4b) temperature anomalies relative to Long term mean (1981-2010) are also shown.

Rainfall performance

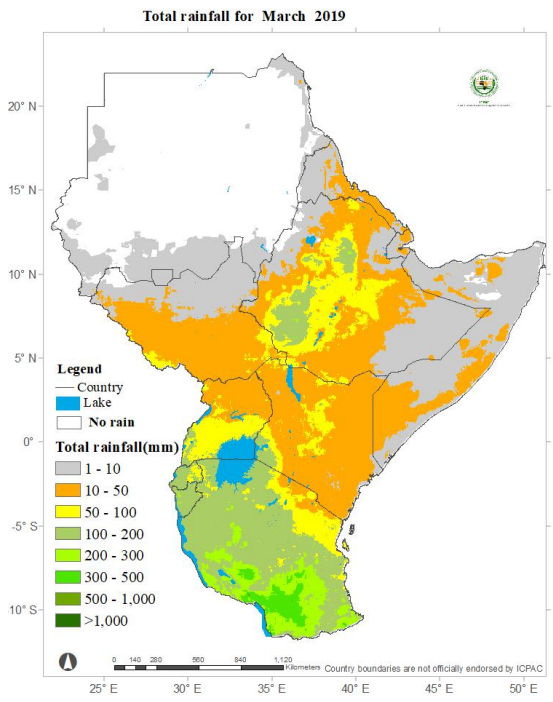

Figure 1: Spatial distribution of rainfall during the month of March 2019*(Data Source : Blended CHIRPS)*

South Sudan, Ethiopia, Kenya and Uganda: rainfall of between 50mm and 200mm was recorded in central and southwest Ethiopia, southern parts of Uganda, and in western, central and north-central Kenya. Northern South Sudan, northern and eastern Ethiopia and northern Kenya recorded less than 10mm of rainfall. Much of the rest of these areas recorded between 10mm and 50mm of rainfall. Most of these areas recorded below normal or near normal rainfall except for a few areas in northwest Ethiopia and northeast Kenya which recorded above normal rainfall.

Rwanda Burundi and Tanzania: eastern Rwanda and northeastern Tanzania recorded between 10mm and 100 mm of rainfall. Much of the rest of these areas recorded between 100mm and 500 mm of rainfall. Eastern Rwanda, eastern Burundi, and north and eastern parts of Tanzania recorded below normal rainfall. Much of the rest of these areas recorded near normal rainfall with central and southwest part of Tanzania recording above normal rainfall.

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

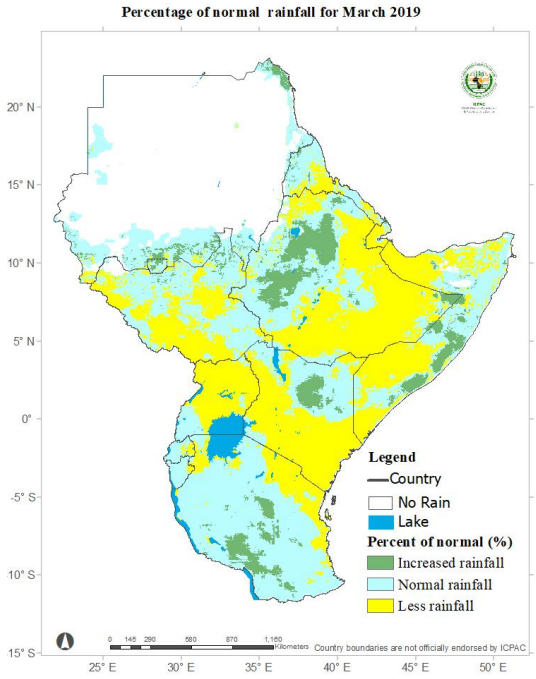

Figure 2: Percentage of average rainfall for March 2019 *(Data Source: Blended CHIRPS)*

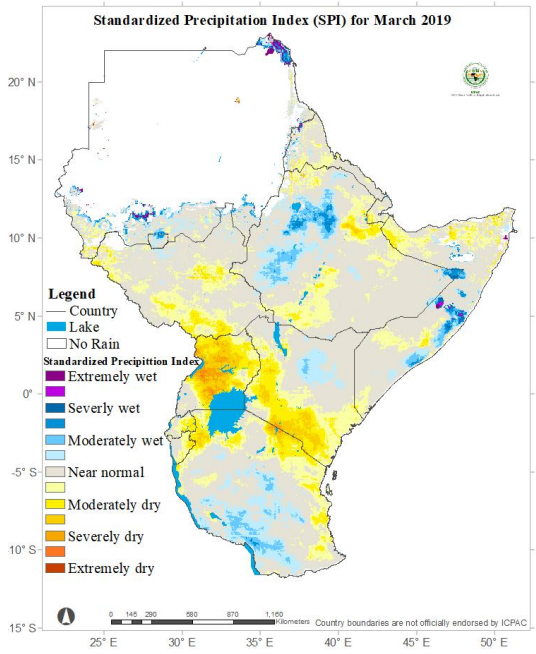

Figure 3: Standardized Precipitation Index for March 2019 *(Data Source: Blended CHIRPS)*

Temperature Conditions

Sudan and Somalia: several parts of these areas recorded maximum and minimum temperature that was cooler than the climatological mean. Southern part of Somalia recorded maximum and minimum temperature that was warmer than the climatological mean, and westrn part of Sudan recorded maximum temperature that was warmer than the climatological mean.

South Sudan, Ethiopia: southern part of South Sudan, and central and southern Ethiopia, recorded maximum and minimum temperature warmer than the climatological mean. Much of the rest of these areas recorded maximum and minimum temperatures cooler than or near the climatological mean.

Eritrea, Djibouti, Uganda, Kenya, Rwanda, Burundi and Tanzania: Most of these areas recorded maximum and minimum temperature warmer than or near the climatological mean.

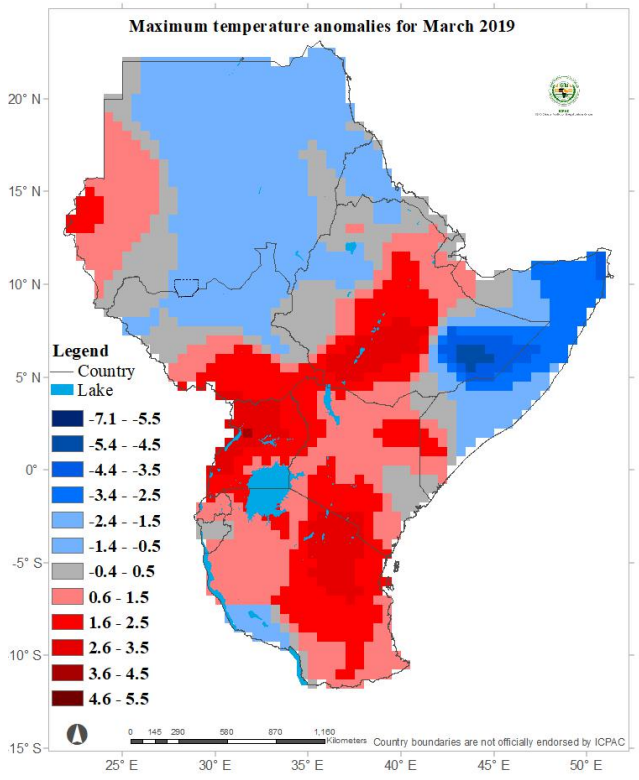

Figure 4a: Maximum temperature anomalies for March 2019 from LTM, 1981-2010 (*Data Source: Data Source: provided by the NOAA-NCEP CPC . GTS gridded data*)

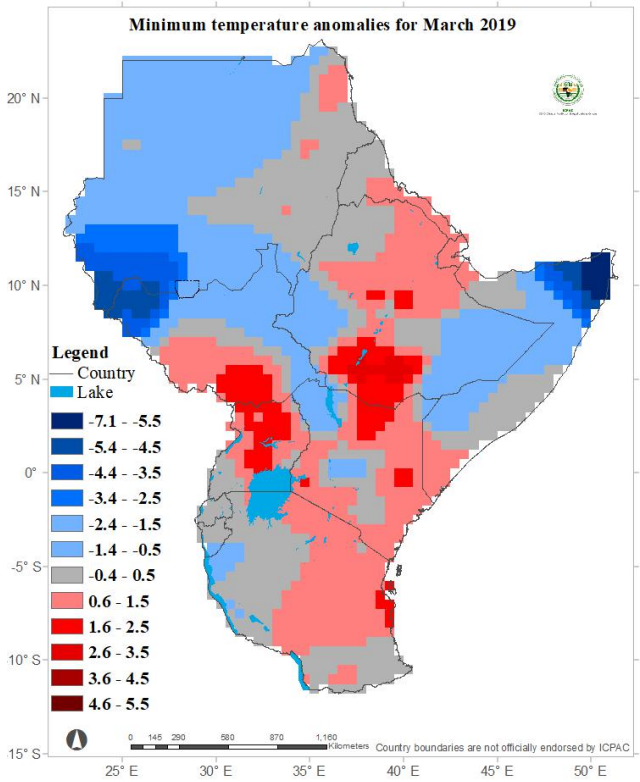

Figure 4b: Minimum temperature anomalies for March 2019 from LTM, 1981-2010 *(Data Source: Data Source: provided by the NOAA-NCEP CPC . GTS gridded data)*

Vegetation Condition Indicators

The Normalized Difference Vegetation Index (NDVI) anomaly for March 2019 (Figure 5) indicates that:

South Sudan, and Ethiopia: indications of improvement in vegetative condition as compared to the mean was observed in western South Sudan, and western parts of Ethiopia. However some areas in the eastern margins of central Ethiopia showed signs of deterioration in vegetative conditions.

Uganda, Kenya and Tanzania: several parts of Uganda, western, central and southern parts of Kenya, and northeastern Tanzania showed signs of deterioration in vegetative conditions as compared with the mean.

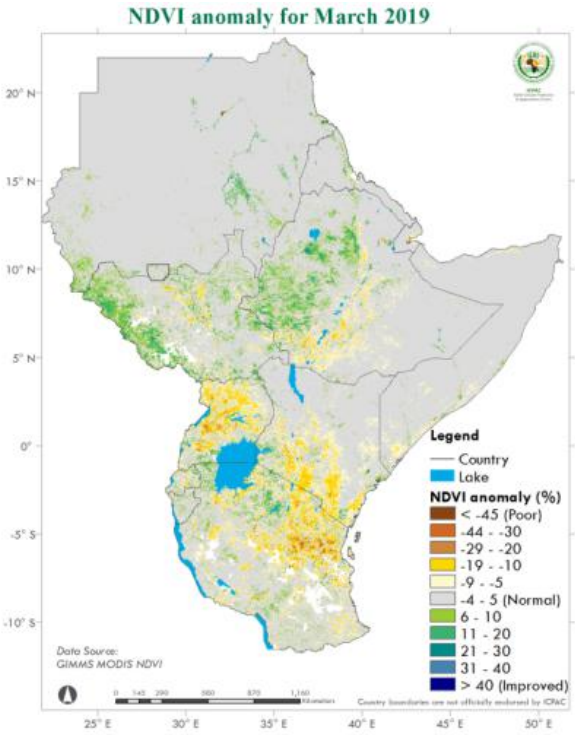

Figure 5: Normalized Difference Vegetation Index (NDVI) for March 2019 *(Data Source: USGS-NASA)*

Much of the rest of the GHA region indicated little or no change in vegetative conditions as compared to the average for the month of March 2019 (Figure 5).

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the period of March 2019 showed that equatorial Pacific Ocean was dominated by warmer than average SST (Figure 6), this situation currently presents a positive, Oceanic Nino Index (ONI) (Figure 8) and an El Niño condition. Models forecasting El Niño Southern Oscillation ENSO event show a likelihood of a persistent weak El Niño phase through much of the second quarter of 2019. Near average to warmer than average SST conditions dominated equatorial Indian Ocean (Figure 6). This pattern has presented a neutral Indian Ocean Dipole (IOD) (Figure 7). Models show a likelihood of a persistent neutral phase of the IOD through much of the second quarter of 2019.

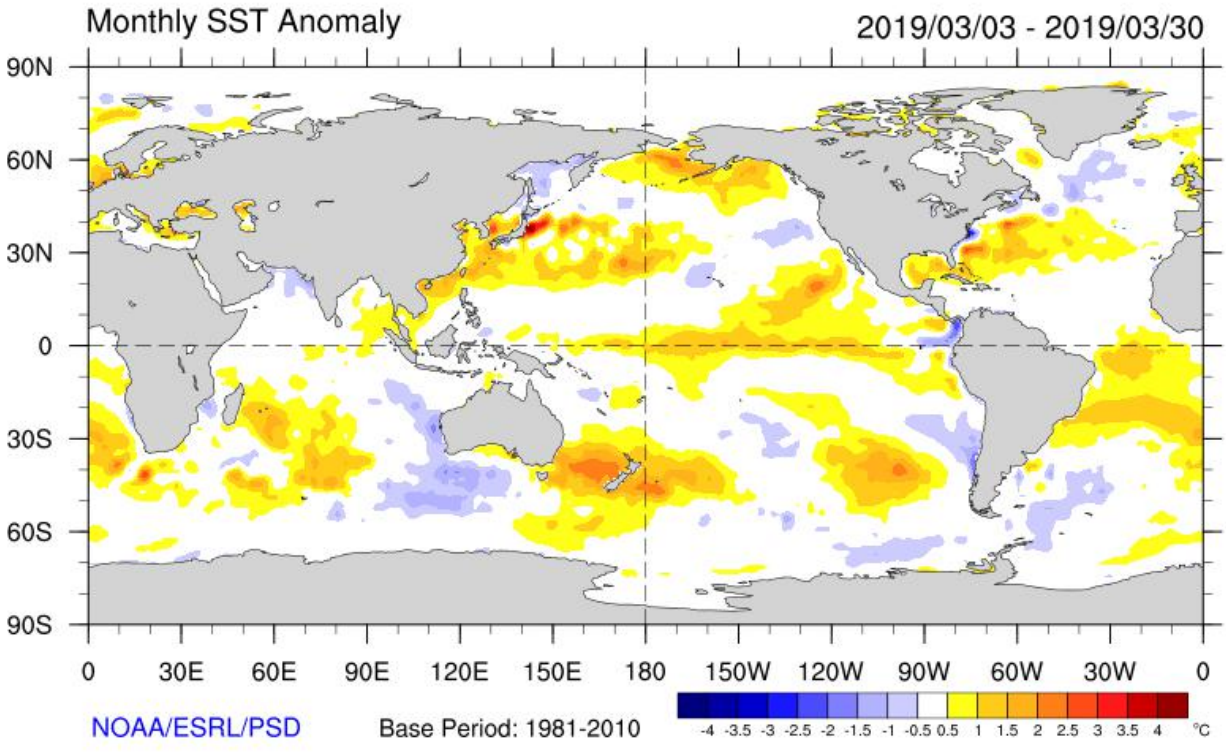

Figure 6: Sea Surface Temperature anomalies for the period of March 2019 (*Source: NOAA***)**

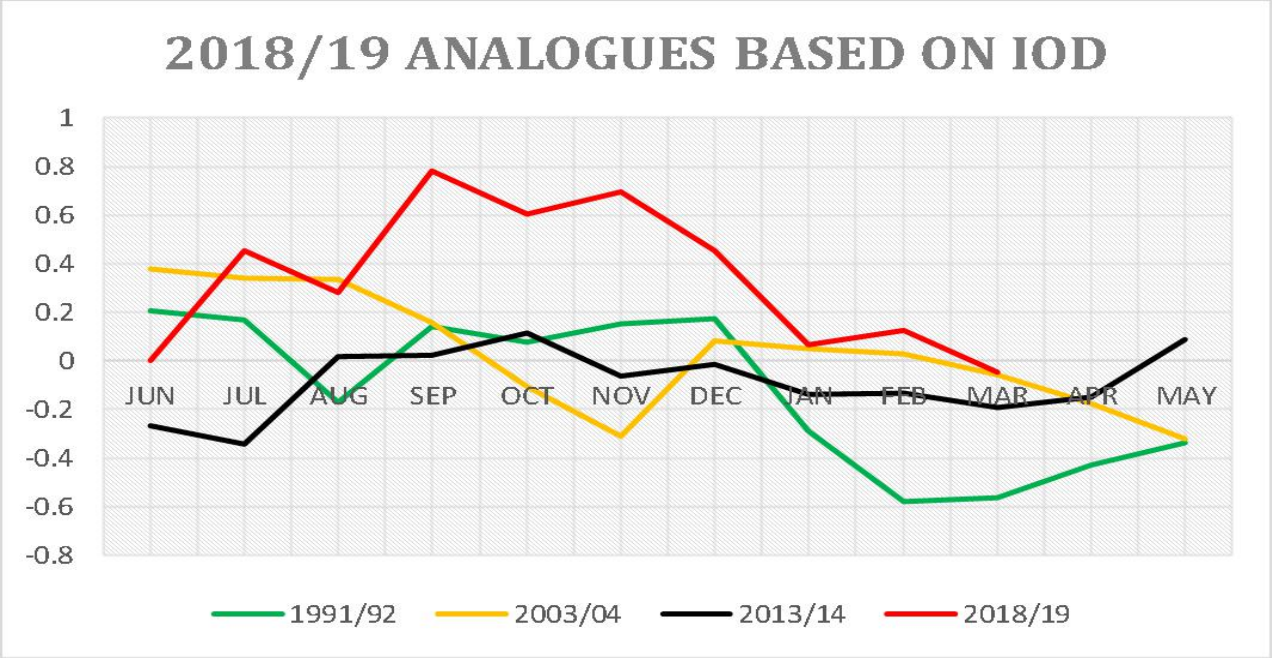

Figure 7: The Indian Ocean Dipole (IOD) during 2019 and analogue years.

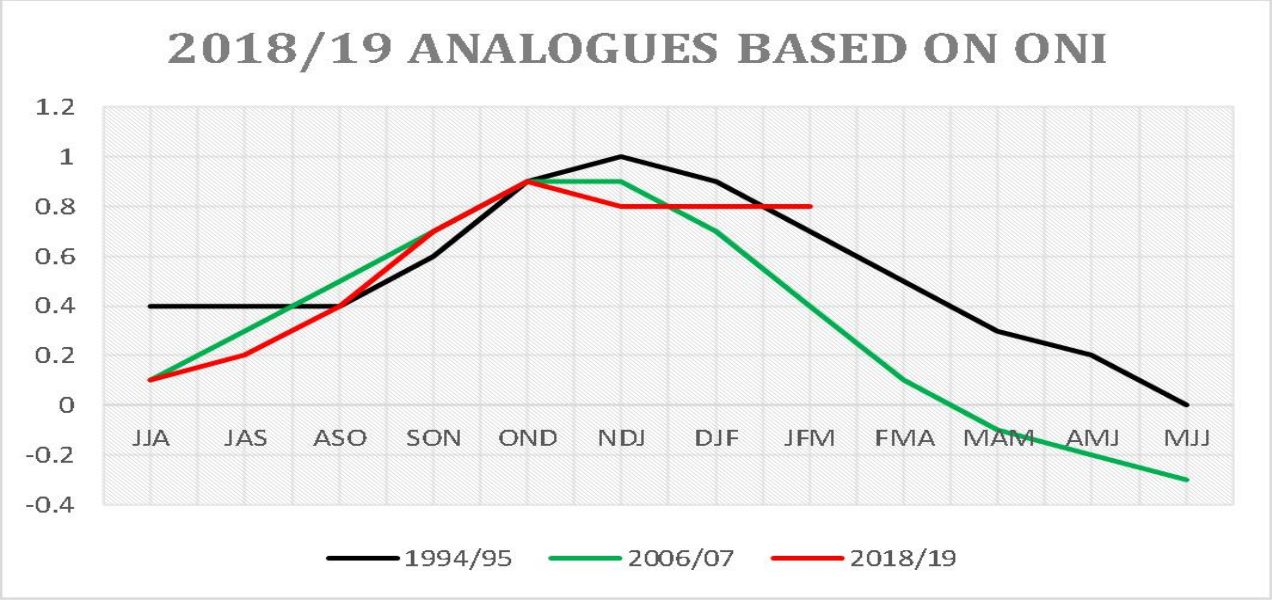

Figure 8: The Oceanic Nino Index (ONI) during 2019 and analogue years.

5. CLIMATE OUTLOOK FOR MAY 2019

The climate outlook for temperature and precipitation for the month of May 2019 are generated from the GHA region customized Weather Research and Forecasting (WRF) model.

May 2019 rainfall forecast

The rainfall forecast for May 2019 in Figure 9(a) indicates generally dry conditions (less than 10mm) in eastern and northern Kenya, central Tanzania, northwestern Ethiopia,

Eritrea and central and northern Sudan. South Sudan, western Ethiopia, north-western and central Somalia and coastal Tanzania will receive over 200mm. The rest of the regions in the GHA are forecasted to to receive moderate rainfall, in the range of 10-200mm.

May 2019 Temperature forecast

Highest temperatures above 32 ºC is forecasted in south-western Sudan, with the rest of the country being above 30 ºC. Much of Tanzania, Rwanda, Burundi, southern Uganda, western Kenya and central Ethiopia are forecasted to be the coldest, with an average of less than 22 ºC. Majority of the rest of the GHA, will largely be warm in the range of 22-30 ºC.

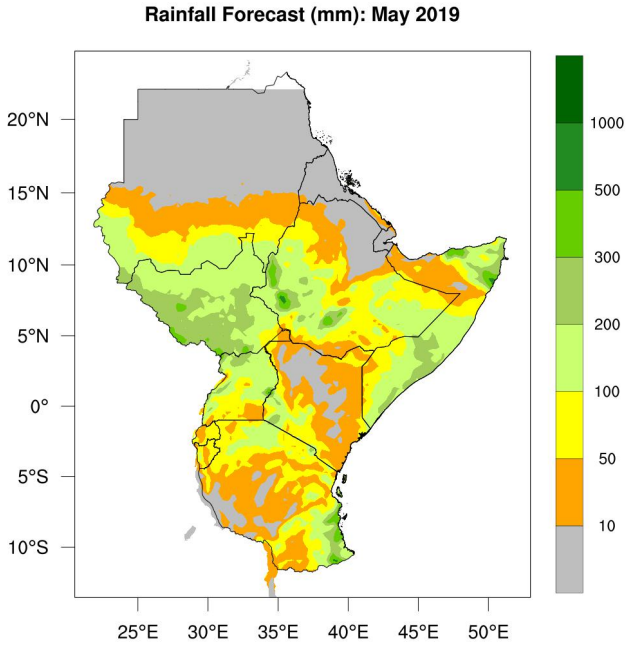

Figure 9a: Forecast of rainfall total for May 2019 (WRF).

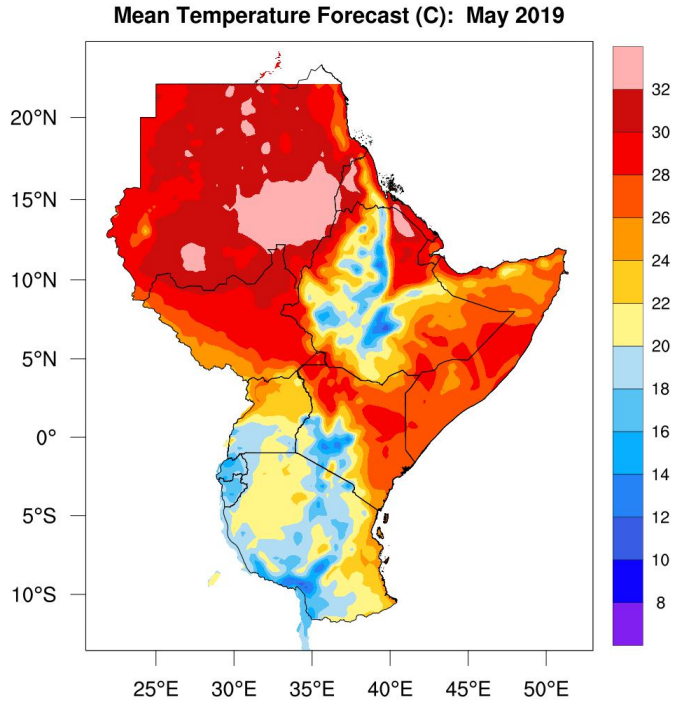

Figure 9b: Mean temperature forecast for May 2019 (WRF).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed climate conditions are provided below.

Impacts of observed climate conditions during March 2019

During the month of March 2019, some places in eastern and central parts of the equatorial sector continued to experienced dry conditions increasing the likelihood of poor crop, water and livestock performance.

Potential impacts for May 2019 climate outlook

In the month of May 2019, 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 southern part of the northern sector and western and central part of the equatorial sector of the GHA.

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