IGAD Climate Prediction and Applications Centre Monthly Climate Bulletin, Climate Review for April 2019 and Forecasts for June 2019

1. INTRODUCTION

This bulletin reviews the April 2019 climate conditions over the Greater Horn of Africa (GHA) region and highlights the June 2019 rainfall and temperature forecasts together with the socio-economic impacts associated with both the observed and the expected climatic 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 April 2019, while the dominant weather systems are discussed in Section 4. In Section 5, the June 2019 climate forecasts over the GHA are presented. The socio-economic impacts associated with the observed climatic conditions and those expected from June 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 is usually expected over the equatorial sector, southern parts of the northern sector as well as northern and eastern parts of the southern sector of the GHA during the month of April. Several places in southeast and southwest part of the northern sector, and western and eastern parts of the equatorial sector of the GHA recorded rainfall that was below normal. Much of the rest of the GHA recorded near normal rainfall, except for northern and central Ethiopia, northwest Kenya, parts of east and southern Rwanda, northern Burundi, and several parts of Tanzania which recorded above normal rainfall, during the month of April 2019 (Figure 2 and 3).

Several parts of the equatorial sector and southern sector of the GHA and also including southern part of the northern sector of the GHA recorded maximum and minimum temperature that was 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 April 2019.

Some areas in the equatorial sector of the GHA reported drier conditions as a result of delayed onset of rainfall in the March to April season, which was an extended drier conditions from short rain season in September to December 2018, leading to water stress related impacts. The general rainfall condition in the southern sector and western

parts of the equatorial sector of GHA resulted in the improvement of water and pasture conditions which might increase prospects of good crop, and livestock productivity.

By April 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 neutral condition (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 June 2019, rainfall is expected to be concentrated over southern and central parts of the northern sector, and northwest and central parts of equatorial sector of the GHA (Figure 8a).

3. CLIMATE PATTERNS IN April 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 April 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

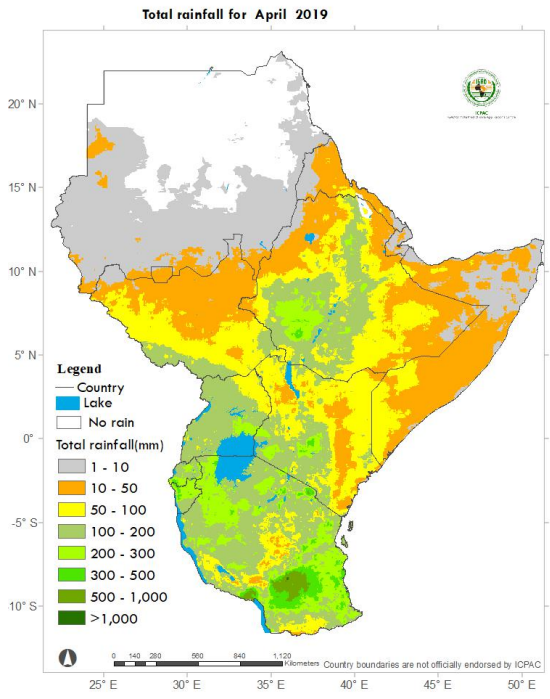

Figure 1: Spatial distribution of rainfall during the month of April 2019*(Data Source : Blended CHIRPS)*

South Sudan and Uganda: several parts of Uganda and southwest part of South Sudan recorded rainfall amounts of between 100mm and 200mm. Much of the rest of South Sudan, and northwest Uganda recorded less than 100mm of rainfall. Most of these areas recorded below normal or near normal rainfall

Djibouti, Ethiopia, Somalia and Kenya: central and southwest part of Ethiopia, and western and central Kenya recorded rainfall of between 100mm and 300mm. Several parts of Djibouti, northeast Somalia and eastern part of Ethiopia recorded less than 10mm. Much of the rest of these areas recorded between 10mm and 100mm. Several parts of Djibouti, Somalia, eastern and southern Ethiopia, and eastern and western Kenya recorded above normal rainfall. Much of the rest of these area recorded near normal rainfall except for northern, central and southwestern part of Ethiopia and northwest Kenya which recorded above normal rainfall.

Rwanda Burundi and Tanzania: Most of these areas recorded total rainfall amounts of between 100mm and 300mm. Southern part of Tanzania recorded rainfall exceeding 500mm. Most of these areas recorded near normal or 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.

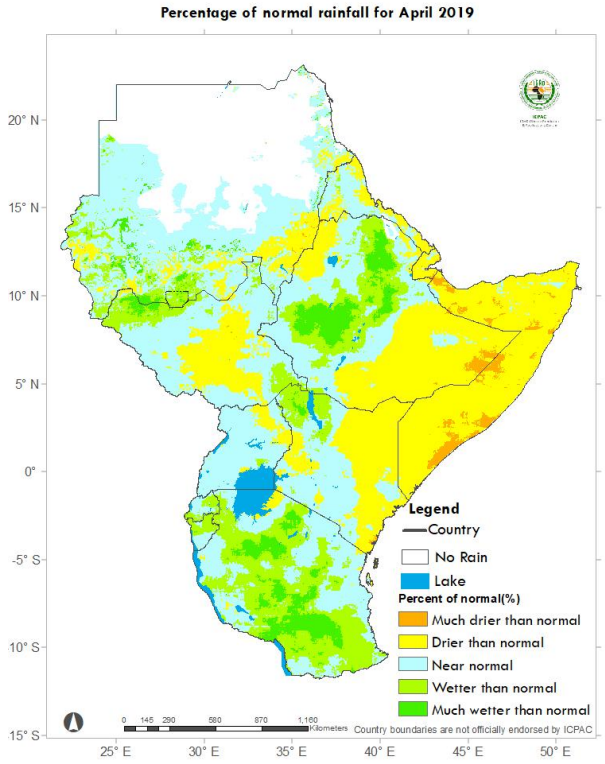

Figure 2: Percentage of average rainfall for April 2019 *(Data Source: Blended CHIRPS)*

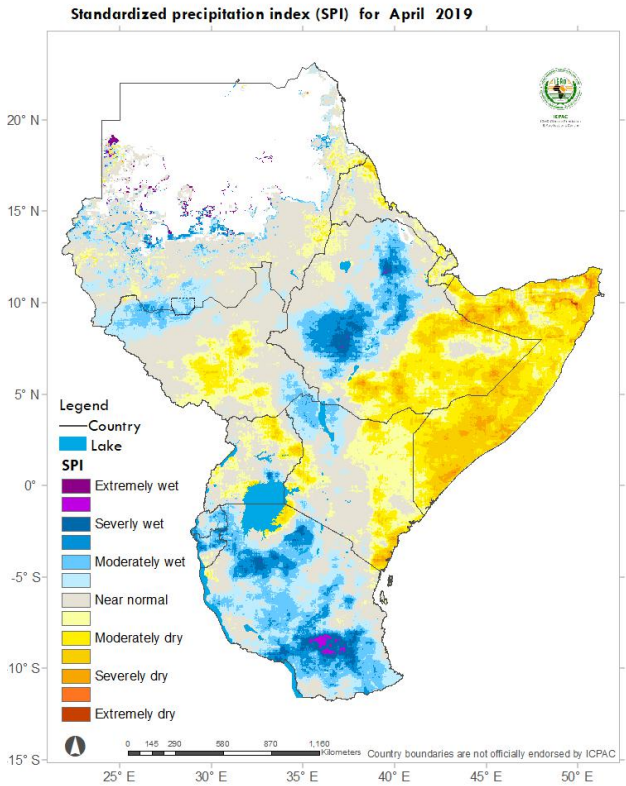

Figure 3: Standardized Precipitation Index for April 2019 *(Data Source: Blended CHIRPS)*

Temperature Conditions

Sudan : Most of Sudan recorded maximum and minimum temperature that was cooler than or near the climatological mean during the month of April 2019.

South Sudan, Ethiopia, and Somalia: northern part of South Sudan, western Ethiopia, and northeast Somalia recorded maximum and minimum temperature that was cooler than the climatological mean. Much of the rest of these areas recorded maximum and minimum temperatures cooler than or near the climatological mean.

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

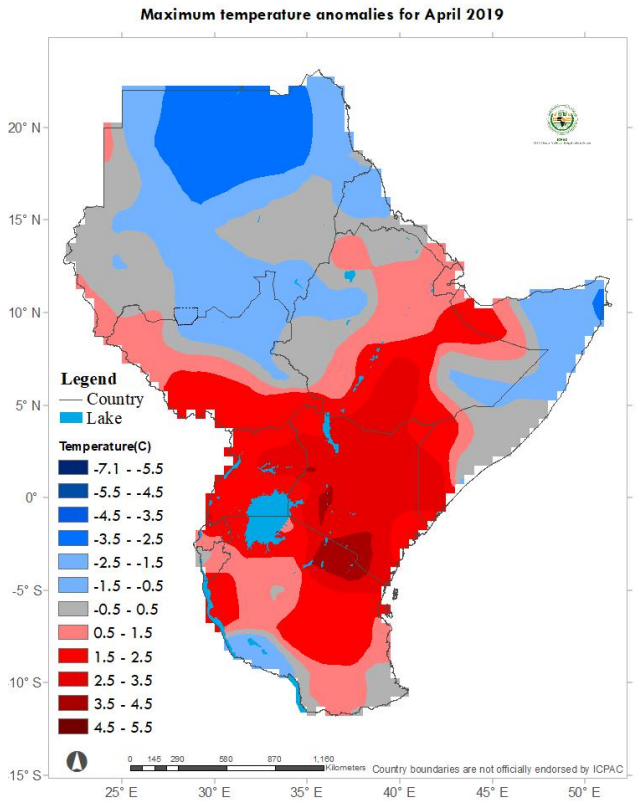

Figure 4a: Maximum temperature anomalies for April 2019 from LTM, 1981-2010 (*Data Source: Data Source: provided by the NOAA-NCEP CPC . GTS gridded data*)

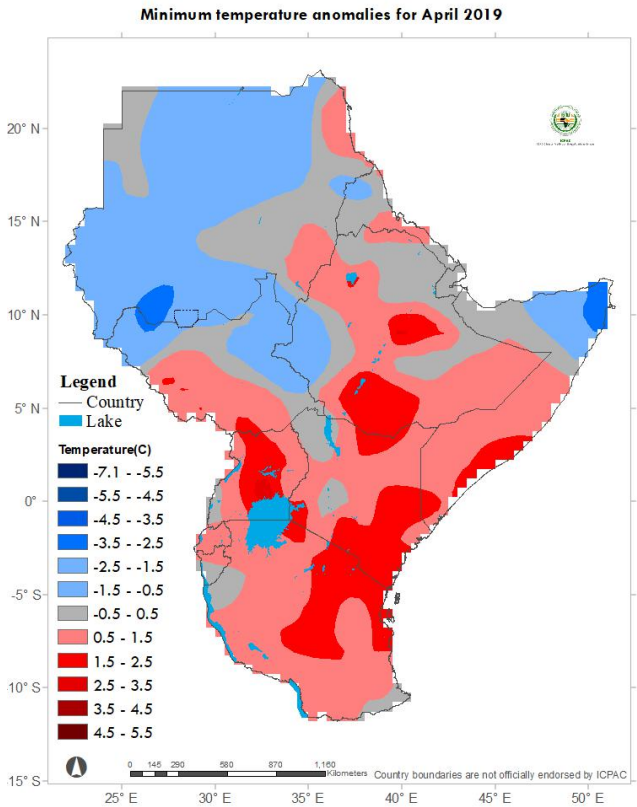

Figure 4b: Minimum temperature anomalies for April 2019 from LTM, 1981-2010 *(Data Source: Data Source: provided by the NOAA-NCEP CPC . GTS gridded data)*

Vegetation Condition Indicators

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

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

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

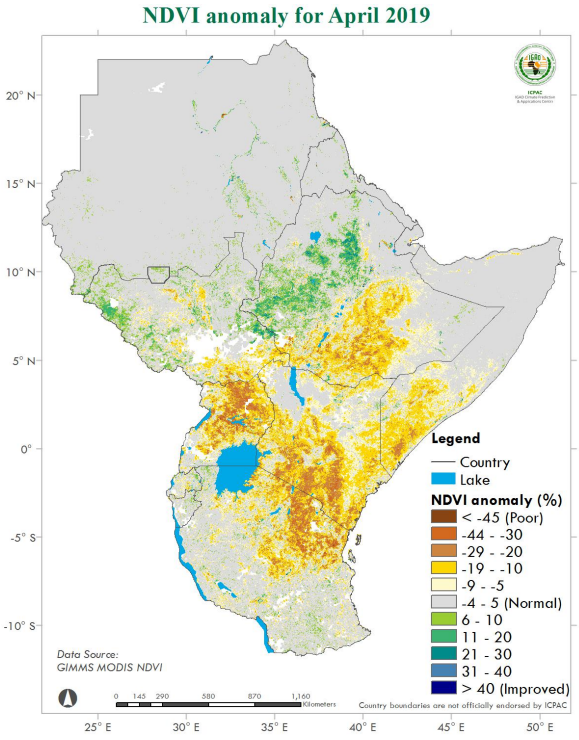

Figure 5: Normalized Difference Vegetation Index (NDVI) for April 2019 *(Data Source: USGS-NASA)*

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 April 2019 (Figure 5).

4. STATUS OF THE CLIMATE SYSTEMS

The Sea Surface Temperature (SST) anomaly during the period of April 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.

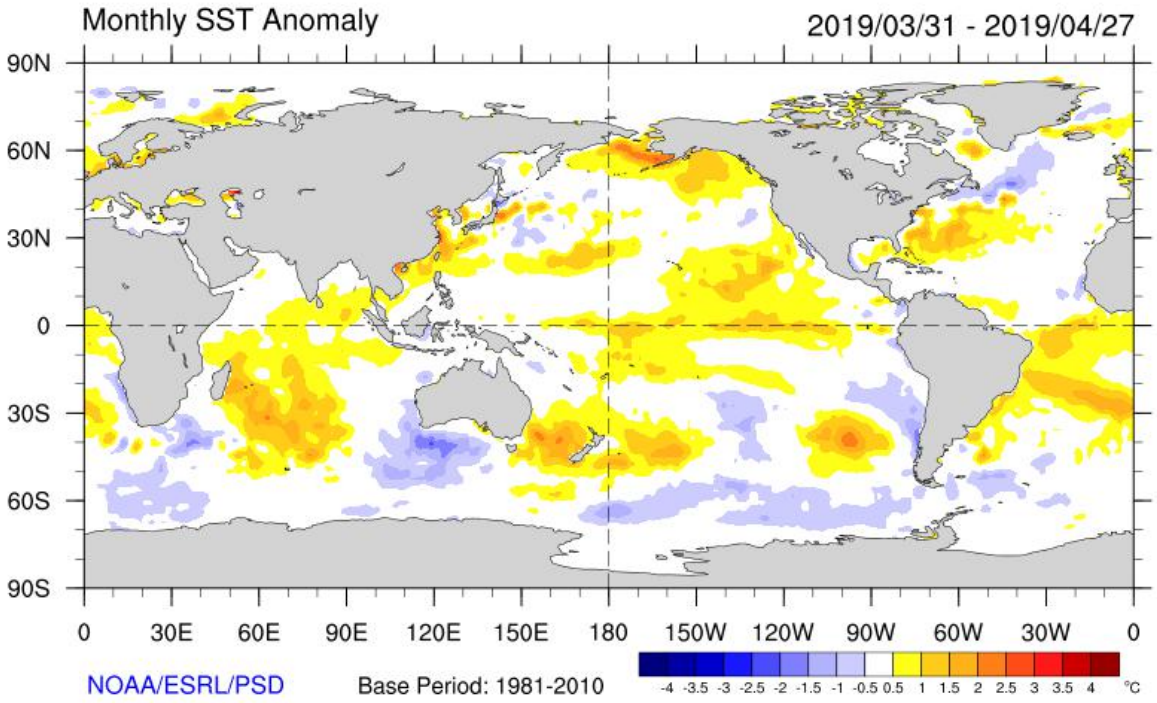

Figure 6: Sea Surface Temperature anomalies for the period of April 2019 (*Source: NOAA***)**

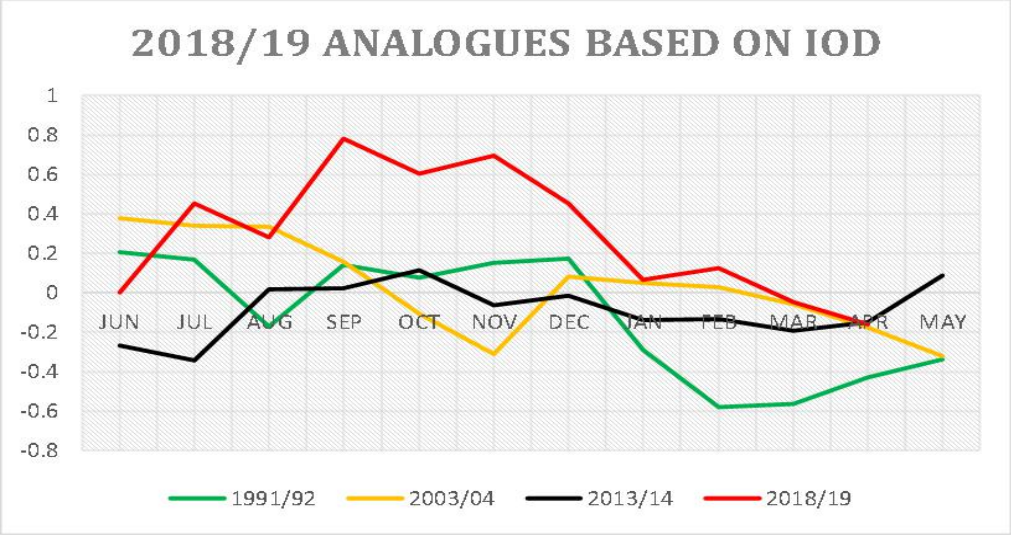

Figure 7: The Indian Ocean Dipole (IOD) during 2019 and analogue years.

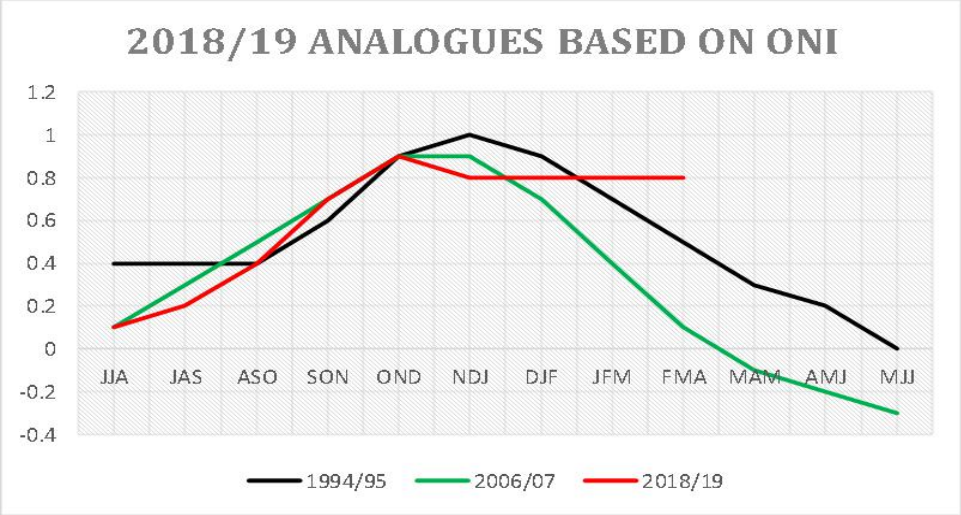

Figure 8: The Oceanic Nino Index (ONI) during 2019 and analogue years.

5. CLIMATE OUTLOOK FOR JUNE 2019

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

June 2019 rainfall forecast

The rainfall forecast for June 2019 in Figure 9(a) indicates generally dry conditions (less than 10mm) in southern and eastern Ethiopia, much of Somalia, and eastern and northern Kenya. Several parts of South Sudan, southern part of Sudan, western and central Ethiopia, and western and eastern parts of Kenya are forecasted to to receive rainfall exceeding 200mm.

June 2019 Temperature forecast

Highest temperatures above 32 ºC is forecasted in several parts of Sudan, Eritrea, Djibouti, northern Ethiopia, and northern Somalia. Much of Tanzania, Rwanda, Burundi, Uganda, western and central Kenya, and central and western Ethiopia are forecasted to be cooler, with an average temperature of less than 22 ºC. Majority of the rest of the GHA, will largely be warm in the range of 22-30 ºC.

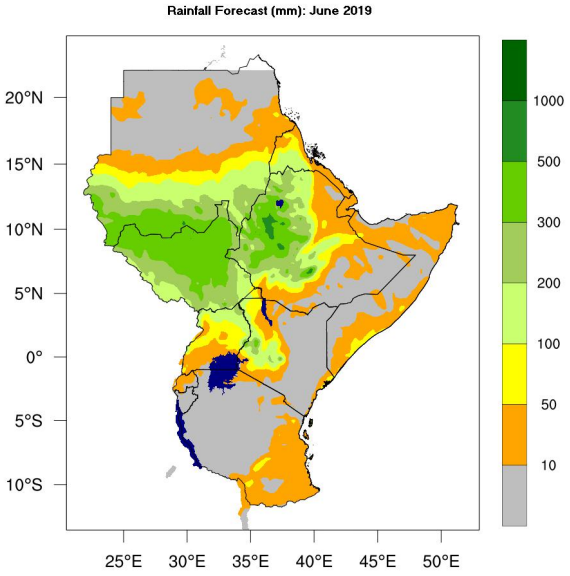

Figure 9a: Forecast of rainfall total for June 2019 (WRF).

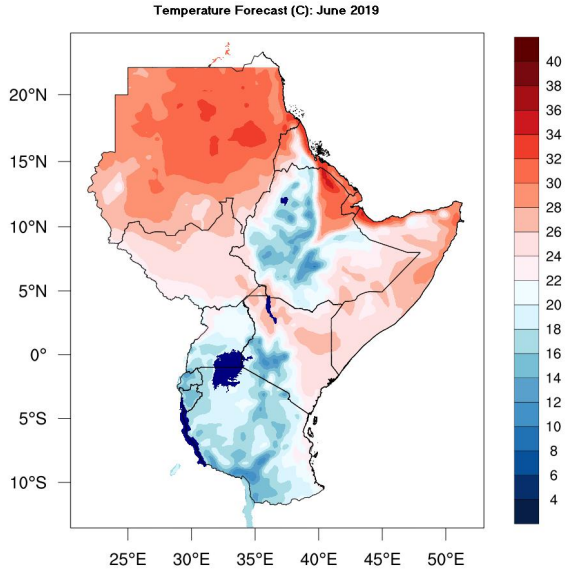

Figure 9b: Mean temperature forecast for June 2019 (WRF).

6. IMPACTS ON SOCIO-ECONOMIC SECTORS

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

Impacts of observed climate conditions during April 2019

During the month of April 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. Flooding and related impact was reported in in parts Tanzania.

Potential impacts for June 2019 climate outlook

In the month of June 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 southwest and south-central part of the northern sector and western and central part of the equatorial sector of the GHA.

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