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# IGAD Climate Prediction and Applications Centre Monthly Bulletin, March 2017

*For referencing within this bulletin, the Greater Horn of Africa (GHA) is generally subdivided into three sub-sectors: The equatorial sector lying approximately between -5° and 5° latitude, with the northern and southern sectors occupying the rest of the northern and southern parts of the region respectively*

## 1. INTRODUCTION

This bulletin reviews the climate condition over the Greater Horn of Africa (GHA) region for the month of March 2017, and also highlights the rainfall and temperature outlook for the month of May 2017 period, together with the socio-economic impacts associated with both the observed and the predicted conditions.

In the month of March, rainfall is mainly expected in some areas in the equatorial sector and also in the southern sector of the Greater Horn of Africa. In March 2017, the ENSO signalshowed a weak positive but neutral state with the Indian Ocean Dipole (IOD) index also being positive. Rainfall has been received in much of the southern sector and over a few areas in west and southern equatorial sector as well as over the southwestern and south-central parts of the northern sector of the GHA region..

## 2. HIGHLIGHTS

Rainfall activities were mainly observed over much of the southern sector with areas around west and central parts of the equatorial sector, as well as south-central part of the northern sector during the month of March 2017. The rainfall performance was near average for most of the region, with a few areas especially in eastern part of the equatorial and southern part of the northern sector recording below the average rainfall, while a few isolated areas in the central part of the northern sector as well as western part of the equatorial sector recording above the average rainfall.

The rainfall condition in the GHA region during the month of March 2017 has brought with it a relief in some of the areas especially in the equatorial and southern sector of the GHA which were previously under dry conditions. However some areas especially in the eastern parts are still experiencing impacts of drought conditions such as deterioration of water and pasture conditions, migration of pastoralists, increase in human-wildlife conflict, poor prospect of crop and livestock production, increase in food prices, and water stress.

During the month of May 2017, rainfall is likely to be concentrated in over western and central parts of the equatorial sector, as well as south west, south-central and south eastern parts of the northern sector of the GHA region.

## 3. CLIMATE PATTERNS IN MARCH 2017

The rainfall amounts, rainfall performance as compared to the Long Term Mean using percentage of long term average and Standardized Precipitation Index (SPI) for March 2017 are provided in this section. The minimum and maximum temperature anomalies are also presented.

# RAINFALL AMOUNTS AND PERFORMANCE DURING MARCH 2017

## Rainfall amounts in March 2017

During the month of March 2017, areas covering much of Sudan, western Eritrea, southern Djibouti, northern part of South Sudan, northwest and south-east of Ethiopia, much of Somalia, as well as north and eastern Kenya recorded rainfall amount less than 10mm.

Rainfall amounts exceeding 100mm was experienced in the central part of Ethiopia, northern and south-eastern Uganda, western Kenya; and over much of Rwanda, Burundi, and Tanzania. With western and southern parts of Tanzania recording more than 200mm of rainfall. The rest of the of the GHA region which covers much of Eritrea, northern Djibouti, central and north eastern Ethiopia, southern part of South Sudan, western, northern and eastern parts of Uganda, in the northwest, central and southeastern parts of Kenya, and north-eastern Tanzania rainfall amounts of between 10mm and 100mm was recorded (Figure 1).

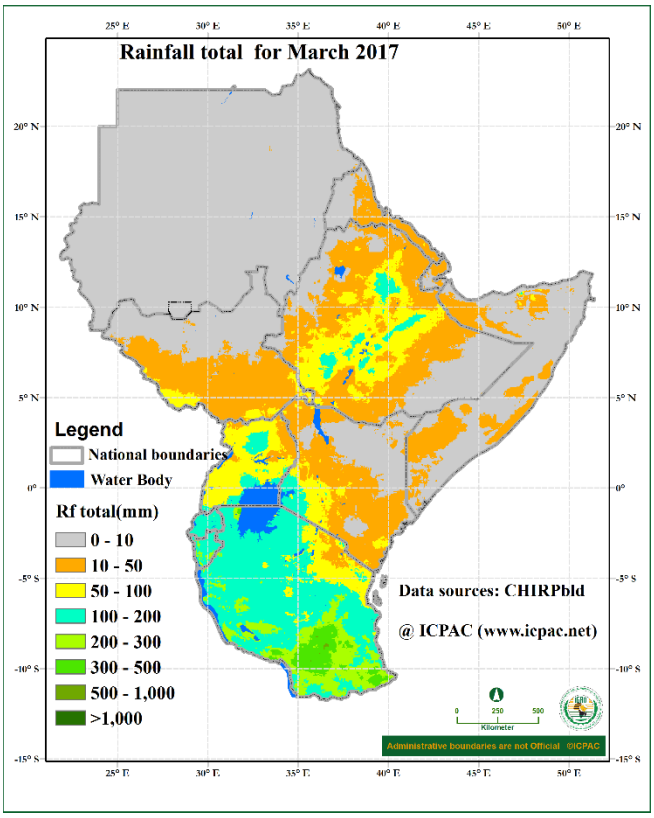


**Figure 1: Spatial distribution of rainfall during the month of March 2017***(Data:ICPAC Blended CHIRP)*

## Rainfall severity for March 2017

Figure 2 shows the amount of rainfall received expressed as percentage of long term average for March while Figure 3 shows SPI for the same month.

In March 2017 rainfall amounts greater than 125% of the long term average was mainly recorded in southeastern and southwestern parts of Eritrea; over much of Djibouti, in northwestern and northeastern parts of Ethiopia; in north eastern South Sudan; over northeastern part of Uganda; in southern Rwanda; round north eastern Burundi; and over southwestern Tanzania (Figure 2). These resulted into moderately wet to extremely wet rainfall conditions (Figure 3). Isolated areas around northwestern part of South Sudan; southeast, southwest and northern parts of Ethiopia; central and southern Somalia; southern and southwestern parts of Uganda; north eastern parts of Tanzania; as well as northern, central and eastern parts of Kenya, recorded less than 75% of the long term average rainfall (Figure 2). These areas correspond to near normal to severely dry rainfall conditions (Figure 3). Much of the rest of the Greater Horn of Africa region received between 75% and 125% of long term average rainfall for the month of March which translated to near normal rainfall conditions

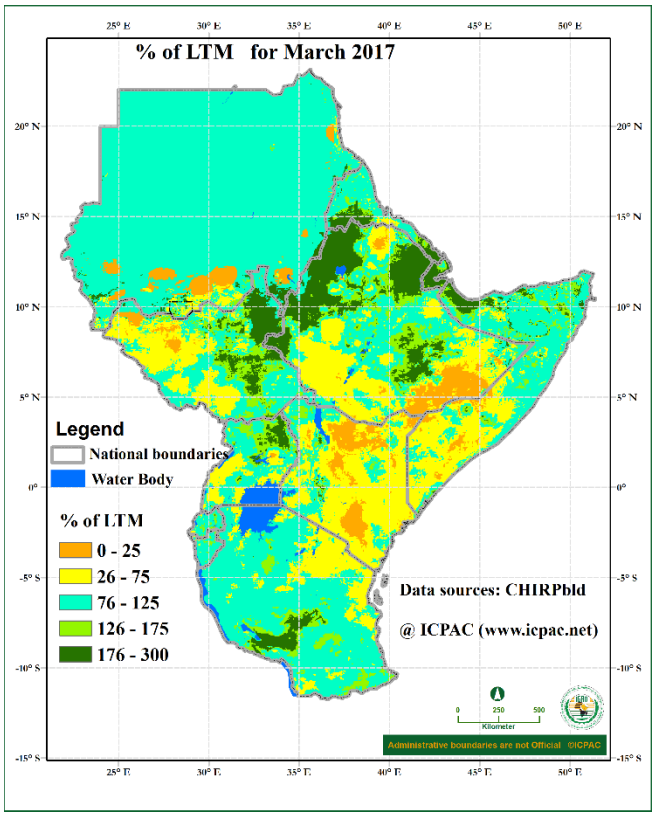


**Figure 2: Percentage of average rainfall for March 2017***(Data: ICPAC Blended CHIRP)*

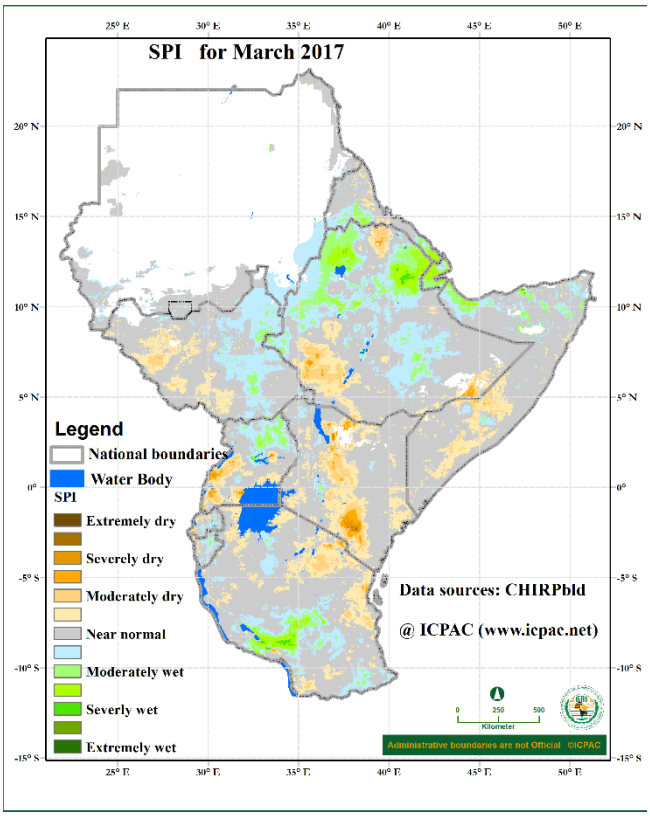


**Figure 3: Standardized Precipitation Index for March 2017***(Data: ICPAC Blended CHIRP)*

## TEMPERATURE CONDITIONS

During the month of March 2017, warmer than average maximum temperatures was experienced much of South Sudan, and Kenya; and in parts of western and southern Ethiopia, northern Uganda, southwestern Somalia, and in north eastern, western and southern parts of Tanzania. Much of northern parts of Sudan, and central Ethiopia experienced maximum temperature conditions that were below the average maximum temperature (Figure 4a). While the rest of the Greater Horn of Africa (GHA) recorded near average maximum temperature.

Much of the GHA region recorded near average to warmer than the average minimum temperature with much of southern part of Sudan, much of South Sudan, south western Eritrea, western and central Ethiopia, northwest and south eastern Kenya, and over isolated parts of central Uganda, and western and north eastern Tanzania recording warmer than the average minimum temperature condition in March 2017. The rest of the GHA region recorded near average minimum temperature.(Figure 4b).

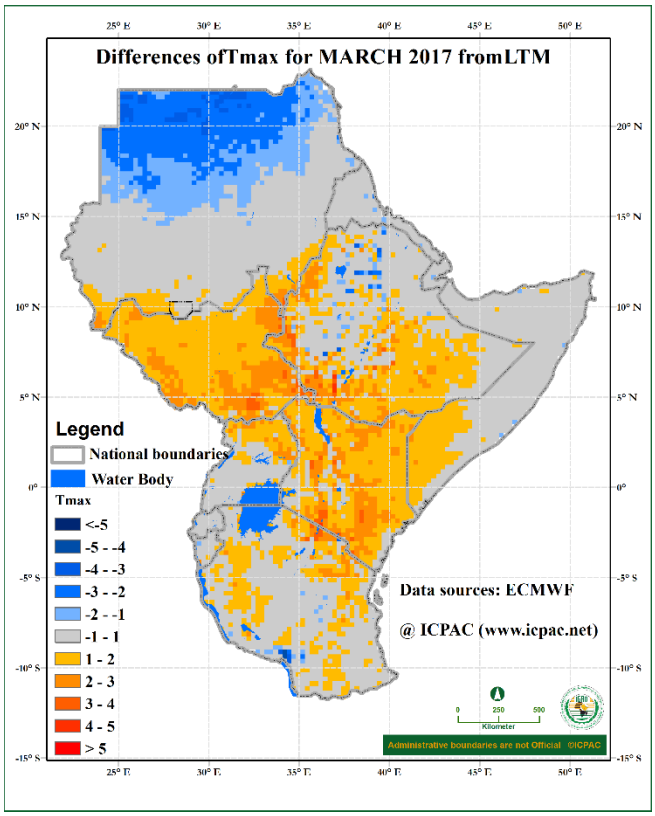


**Figure 4a: Maximum temperature anomalies for March 2017***(Data Source:ECMWF)*

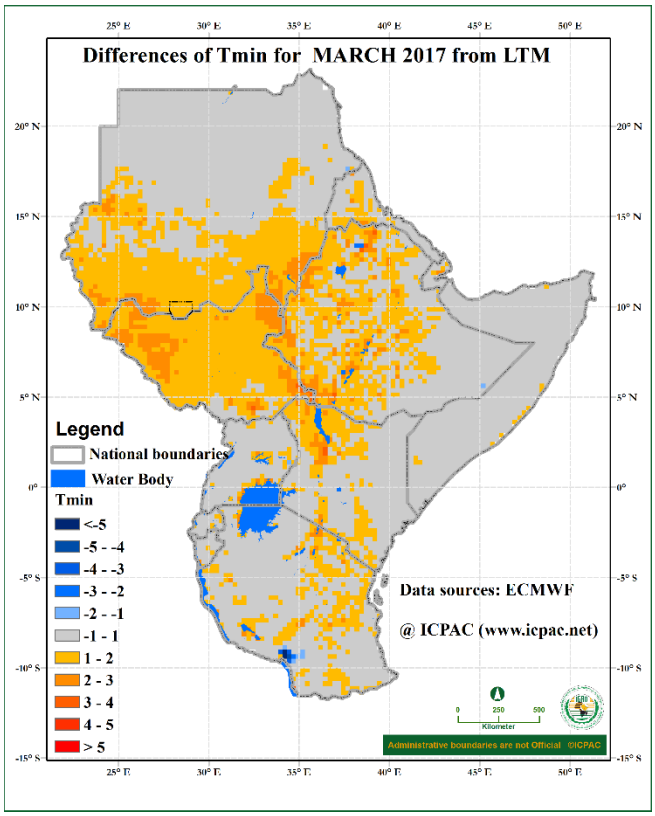


**Figure 4b: Minimum temperature anomalies for March 2017***(Data Source:ECMWF)*

## 4. STATUS OF PACIFIC AND INDIAN OCEANS SST

The seas surface temperature (SST) anomaly during the period between March 12$^{th}$ and 8$^{th}$ of April 2017 showed that over central equatorial Pacific Ocean stretching towards the eastern equatorial Pacific region (Niño 4 to Niño 1&2.) near average to warmer than average SST anomaly has been dominant (Figure 5), however this situation still currently presents a neutral ENSO phase (Figure 6b). Near average to cooler than average sea surface temperature conditions dominated much of central and eastern equatorial Indian Ocean (Figure 5) with near average to warmer than average sea surface temperature being experienced in the western equatorial Indian Ocean. This pattern has presented a positive phase of the Indian Ocean Dipole IOD (Figure 6) similar to recent years such as 1985, 1990, 1993, and 2011.

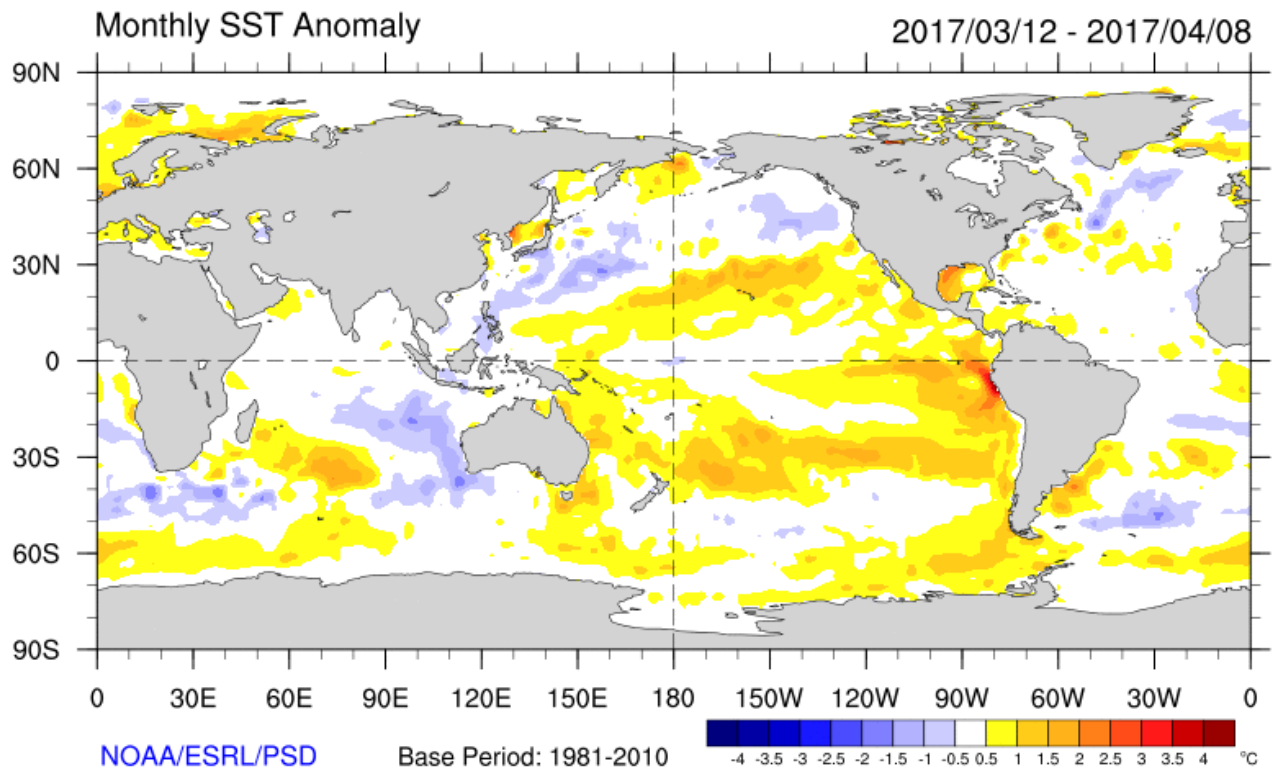


**Figure 5: Sea Surface Temperature anomalies for the period 12 March 2017 to 08 April 2017 (Courtesy of NOAA/ESRL/PSD)**

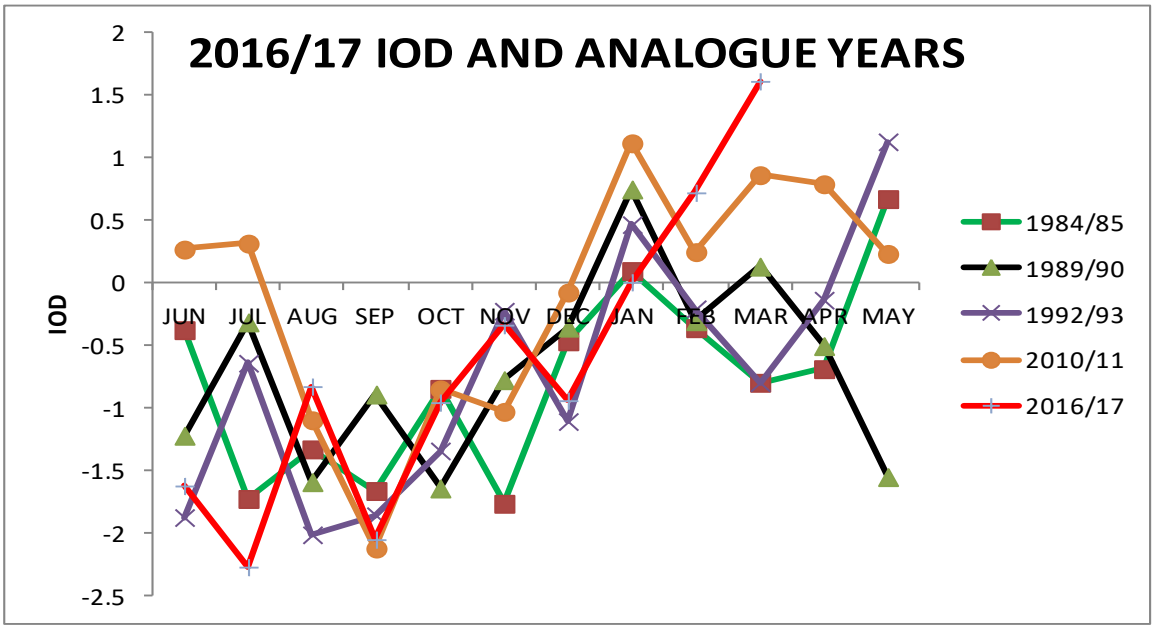


**Figure 6a: The Indian Ocean Dipole (IOD) during 2016/17 and analogue years.**

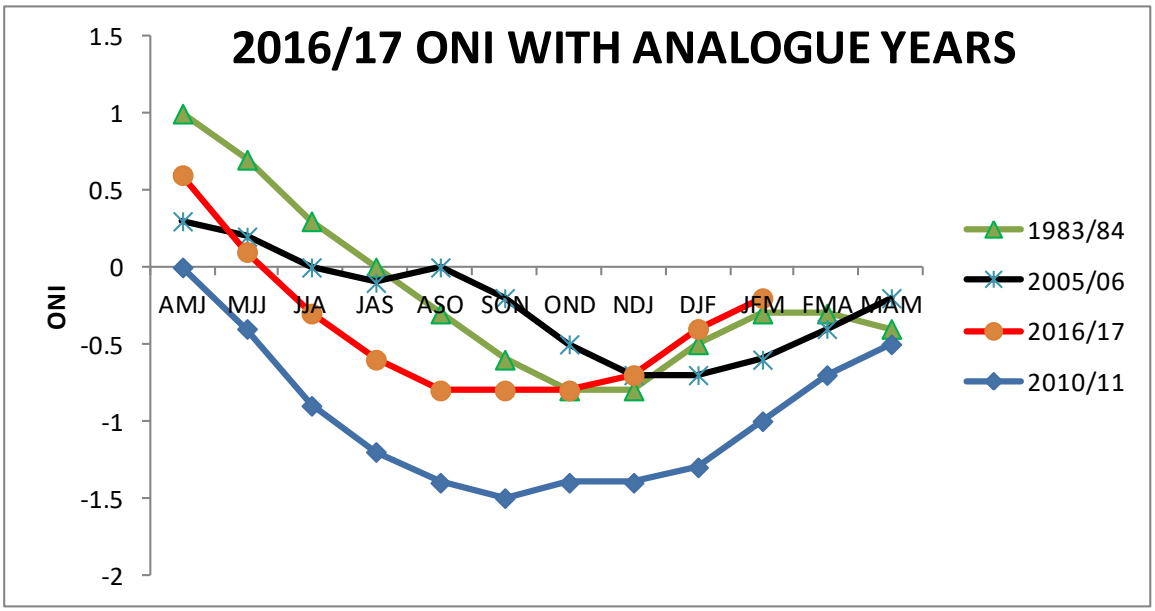


**Figure 6b: The Oceanic Nino Index (ONI) Indian Ocean Dipole (IOD) during 2016/17 and analogue years.**

## 5. CLIMATE OUTLOOK FOR MAY 2017

### The rainfall forecast for May

The rainfall outlook for the month of May 2017 over the GHA region given in Figure 7a shows that rainfall will mainly be experienced over much of South Sudan, southern part of Sudan, over western and south western parts of Ethiopia, over parts of Somalia, much of Uganda, over parts of Rwanda, northern part of Burundi, western, western and central Kenya, central part of Somalia, and over parts of northern and south of Tanzania. Much of the northern part of Sudan, Eritrea, Djibouti, northern Ethiopia, southern Burundi, eastern part of Kenya, and western and northern part of Tanzania are likely to record less than 10mm of rainfall during the month of May 2017 (Figure 7a).

### Temperature Outlook for May 2017

The average temperature forecast for GHA region for the month of May 2017 given in Figure 7b shows that more than 24$^{o}$C is likely to be observed in much of Sudan, south Sudan, Somalia, Djibouti, Eritrea, north and southeast of Ethiopia, northern part of Uganda, north and eastern parts of Kenya, and eastern Tanzania. Average temperature less than 18 $^{o}$C is likely to be observed in central and west of Ethiopia, southern part of Uganda, western and central Kenya, over much of Rwanda, Burundi, and in the west and central Tanzania. The rest of the GHA is likely to record average temperature of between 18$^{o}$C and 24$^{o}$C in the month of May 2017.

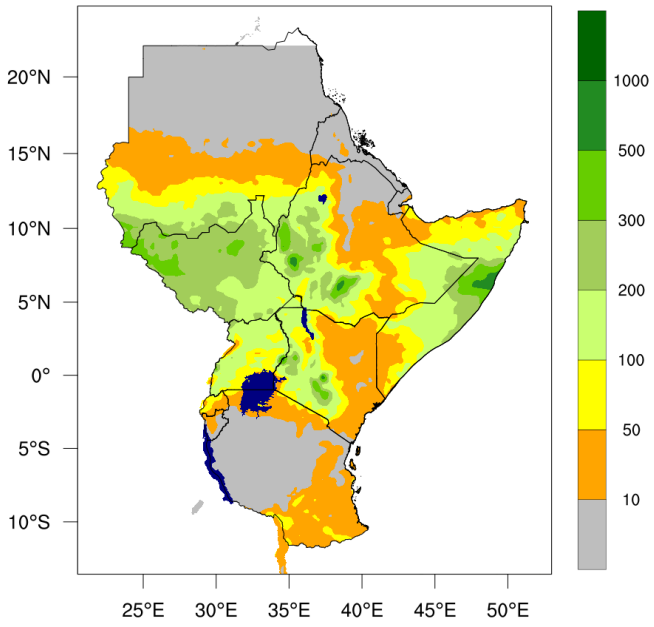


**Figure 7a: Rainfall Outlook for May 2017**

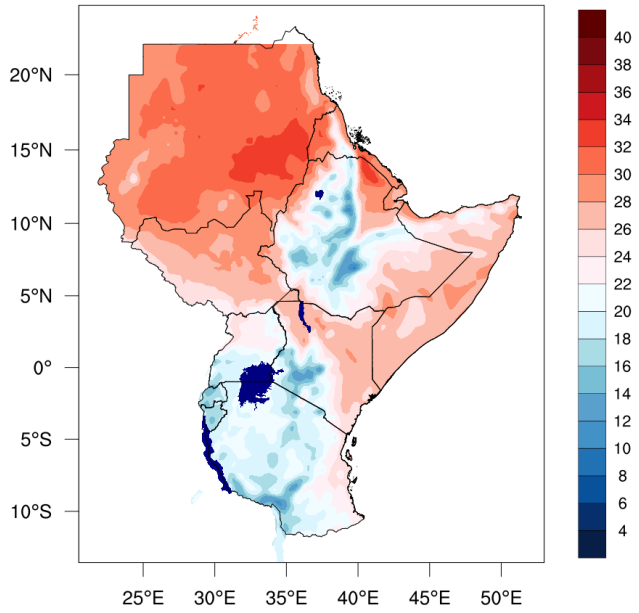


**Figure 7b: Mean temperature outlook for May 2017.**

## 6. IMPACTS ON SOCIO-ECONOMIC SECTORS

The socio-economic impacts associated with observed rainfall conditions and those from the climate outlook are provided below.

### Vegetation condition indicators and associated impacts

The Normalized Difference Vegetation Index (NDVI) anomaly for March 2017 indicated that vegetative conditions showed deterioration as compared to the long term average in areas around southern Ethiopia, southwestern South Sudan, over northern, eastern and south western parts of Uganda, over central, southern and coastal Kenya, in southern areas of Somalia, and over parts of northern and northeastern Tanzania. Improvement in vegetative conditions as compared with the long term average was observed in areas around northeast, west, and southeastern part of South Sudan, and over north and western parts of Ethiopia, around central and southern Uganda, in western part of Kenya, and in north eastern and eastern parts of Tanzania. The rest of the Greater Horn of Africa indicated little or no change in vegetative conditions. (Figure 8).

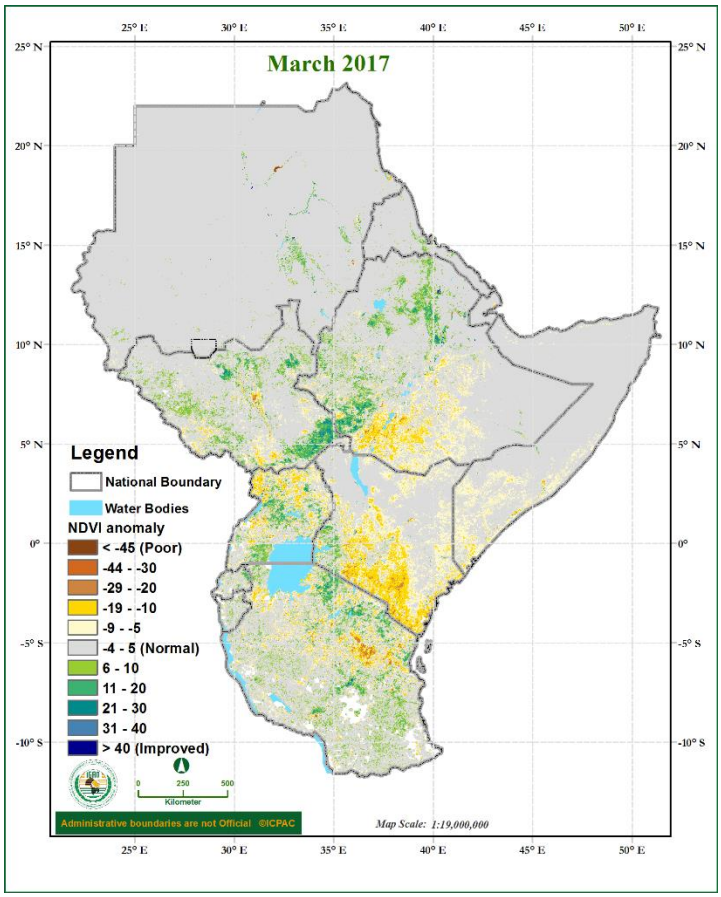


**Figure 8: Normalized Difference Vegetation Index (NDVI) of March 2017 over the Greater Horn of Africa (Data Source: USGS NASA)**

## Impacts of observed climate conditions during March 2017

During the month of March 2017 several places in the Greater Horn of Africa still continued to experience drought related impact has led to: Increased water stress leading to water shortages in urban centres and towns across the east Africa region, reported in Kenya, Uganda, Rwanda and Tanzania; there is reported crop loss leading to poor prospects of crop production, increased risk of food insecurity, and associated increase in food prices, reported in several areas round the equatorial and southern sector of the GHA; there is reported cases of increased cases of insecurity and conflict related to poor pasture and water conditions, these have resulted into loss of livestock, poor prospects of livestock production, and migration of pastoralists.

However some areas in the southern sector have reported improved pasture and water conditions, some areas in the western part of the equatorial sector have also received a substantial amounts of rainfall which have acted as a relief from the previously dry conditions

## Potential impacts for May 2017 climate outlook

From the outlook provided, in the month of May 2017, much of the southern sector and western part of the equatorial sector as well as south western and south central part of the northern sector are likely to have improved water, crop and pasture conditions leading to good prospects for crop and livestock performance. However some parts especially in south eastern Northern sector, eastern and central equatorial sector as well as eastern and southern part of the southern sector are likely to

receive little or rainfall which are likely to result into a continued deterioration of pasture and water resources leading to water related crop and livestock stress and poor prospects for crop and livestock performance.

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